

Detrital Zircon U-Pb Geochronology and Provenance
Analysis of Sedimentary Rocks in the Paleo-Kuril Arc
System (Nemuro and Tokoro Belts), Eastern Hokkaido,
Northern Japan

Harisma

2022

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*Thesis submitted for the Degree of
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Abstract

The Nemuro and Tokoro Belts in eastern Hokkaido are tectonic belts in the Paleo-Kuril Arc (PKA) system situated along the subduction zone between Okhotsk Block (Okhotomorsk Block) and Pacific Plate in the Northwest Pacific Region. Recent studies have suggested that the PKA originated from an intra-oceanic arc system between the Izanagi and Pacific Plates in the Late Cretaceous, suggesting that the boundary between these plates was a trench. However, the result of this study proves that this arc was a volcanic arc placed along the continental margin. In order to identify the origin of the PKA, this study investigated U-Pb age spectra of detrital zircon grains from the Late Cretaceous to Paleogene sandstones in the Nemuro and Tokoro Belts. The results from the sixteen sandstone samples identified two types of U-Pb age distributions of the detrital zircon grains. Type 1 is characterized by multimodal age distributions, ranging from ~2.5 Ga to ~64 Ma (Archean to Paleocene). The presence of populations of Precambrian zircons is distinctive in Type 1, which is predominated by Paleoproterozoic (~1.9 to ~1.8 Ga). Meanwhile, Type 2 sandstones yielded unimodal age distributions that exhibit Paleogene age, ranging from ~64 to ~52 Ma. These different age distributions between sandstones Type 1 and Type 2 indicate a significant provenance transition occurred in the early Paleogene. The evidence of this transition can be identified both in the Nemuro Group (between deposition of the Kiritappu and Shiomi Formations) of the Nemuro Belt and in the Yubetsu Group (between deposition of the Kamibaro and Yasukuni Units) of the Tokoro Belt at the same time during the Paleocene. The Precambrian zircons in Type 1 indicate that PKA developed as a continental arc system rather than an intra-oceanic arc system, which presumably originated from the Okhotsk Plate in North-East Asia during the Late Cretaceous. In contrast, the sandstones of Type 2 were supplied only from a single source of a magmatic arc region that could be associated with the Izanagi-Pacific ridge subduction.

概要

北海道東部の根室帯と常呂帯は、北西太平洋地域のオホーツクプレート（オホーツク海ブロック）と太平洋プレートの間の沈み込み帯に沿って位置する古千島島弧（PKA）系の構造帯です。以前の研究は、PKA が白亜紀後期にイザナギプレートと太平洋プレートの間の海洋内島弧システムとして発達したことを推定しています。この仮説からは、これら二つの海洋プレート間の境界が海溝であったことが示唆されます。しかし、本研究は、この島弧が大陸縁辺に沿って位置していた火山弧であったことを証明しました。PKA の起源を特定するために、本研究では根室帯と常呂帯の白亜紀後期から古第三紀までの砂岩の碎屑性ジルコン粒子の U-Pb 年代測定が実施されました。16 の砂岩サンプルの測定結果から、2 種類のジルコン U-Pb 年代分布が認定されました。タイプ 1 の年代分布は、 ~ 2.5 Ga から ~ 64 Ma（始生代から暁新世）の範囲で複数のピークを持つマルチモーダル年代分布を特徴としています。このタイプの砂岩には先カンブリア時代のジルコンが含まれ、特に原生代（ ~ 1.9 から ~ 1.8 Ga）の粒子がタイプ 1 には特徴的に見られます。一方、タイプ 2 の砂岩は、古第三紀の年代を示す単峰性の年代分布を示し、その年代の範囲は ~ 64 から ~ 52 Ma でした。タイプ 1 とタイプ 2 の砂岩の間のこれらの異なる年代分布は、古第三紀初期に発生した碎屑物供給源の変化を示しています。この供給源変化は、根室帯の根室層群（霧多布層と汐見層の境界）と常呂帯の湧別層群（上芭露層と安国層の境界）の両方ではほぼ同時の暁新世に起こっています。タイプ 1 の先カンブリア時代のジルコンはおそらく北東アジアのオホーツクプレートに由来しており、PKA が白亜紀後期に海洋内の火山島弧ではなく火山陸弧として発達したことを示しています。対照的に、タイプ 2 の砂岩は火山弧内の単一の供給源からのみ供給されており、イザナギ-太平洋海嶺の沈み込みによる火成活動に関連している可能性があります。



Slump deposit in the Akkeshi Formation (Nemuro Group), Hokkaido, Japan (Photo of Fieldwork, 2019)

*'Geologist have a saying –
rocks remember'*

-Neil Armstrong-

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1 Introduction

1.1 Tectonic History of Oceanic Plates in the North Pacific Region Since Cretaceous

The history of oceanic plate movements in the North Pacific region since Cretaceous is still controversial. The current continental crusts in the North Pacific region consist of the Eurasian, Okhotsk, and North American Plates (e.g., Vaes et al., 2019). The Pacific and the Philippine Sea Plates are subducting beneath the volcanic island arcs (i.e., Southwest Japan, Northeast Japan, Kuril, and Aleutian Island Arcs) developed around the margins of these continental plates (Figure 1). However, many studies suggest that the oceanic plate configuration during the Late Cretaceous was noticeably different from that of today (e.g., Bazhenov & Burtman, 1994; Bazhenov et al., 2001; Domeier et al., 2017; Isozaki et al., 2010; Maruyama et al., 1997; Müller et al., 2016; Seton et al., 2015; Taira, 2001; Vaes et al., 2019). In the Cretaceous, the Philippine Sea Plate did not yet exist. It is inferred that the Izanagi Plate, not the Pacific Plate, was subducting to the Eurasian and Okhotsk Plates (Domeier et al., 2017; Isozaki et al., 2010; Maruyama et al., 1997; Müller et al., 2016). The Izanagi Plate was an oceanic plate that bordered the Pacific Plate in the south and subducted northward into the Eurasian and the Okhotsk Plates (Domeier et al., 2017; Isozaki et al., 2010; Maruyama et al., 1997; Müller et al., 2016; Seton et al., 2015). After the Cretaceous, the boundary between the Izanagi and Pacific Plates subducted, and thus the Izanagi Plate disappeared (Domeier et al., 2017; Isozaki et al., 2010; Kimura et al., 2019; Maruyama et al., 1997; Müller et al., 2016; Seton et al., 2015). Seismic tomography suggests that the remnants of the Izanagi Plate exist in the mantle (Seton et al., 2015). Although many studies agree on the existence of the Izanagi Plate and its disappearance after the Cretaceous (e.g., Domeier et al., 2017; Isozaki et al., 2010; Maruyama et al., 1997; Seton et al., 2015), there still remains a disagreement on the relationship between the Izanagi and Pacific Plates and the geological influence of the subduction along the plate boundary zone.

Seton et al. (2015) suggest that an oceanic ridge existed between the Izanagi and Pacific Plates based on a geodynamic model that assimilates surface plate velocities and shallow thermal structure of slabs into the mantle. The model of Seton et al. (2015) predicted that a ridge-transform intersection was subducted to the eastern margin of Eurasia in the period ca. 60–50 Ma. Several studies consider that this subduction resulted in various geological phenomena in the magmatic arcs in the North Pacific region. For instance, Kimura et al. (2019)

interpreted that the ridge subduction induced uplifting and transgression along the northeast Asian margin during the Late Cretaceous to Paleogene. Wu and Wu (2019) suggest that this event also induced a 56 to 46 Ma magmatic gap in the northeast Asian margin. Yamasaki et al. (2021) explained that the magmatism during ca. 46 and 37 Ma in the Hidaka Belt, Hokkaido, was caused by the Izanagi-Pacific ridge subduction.

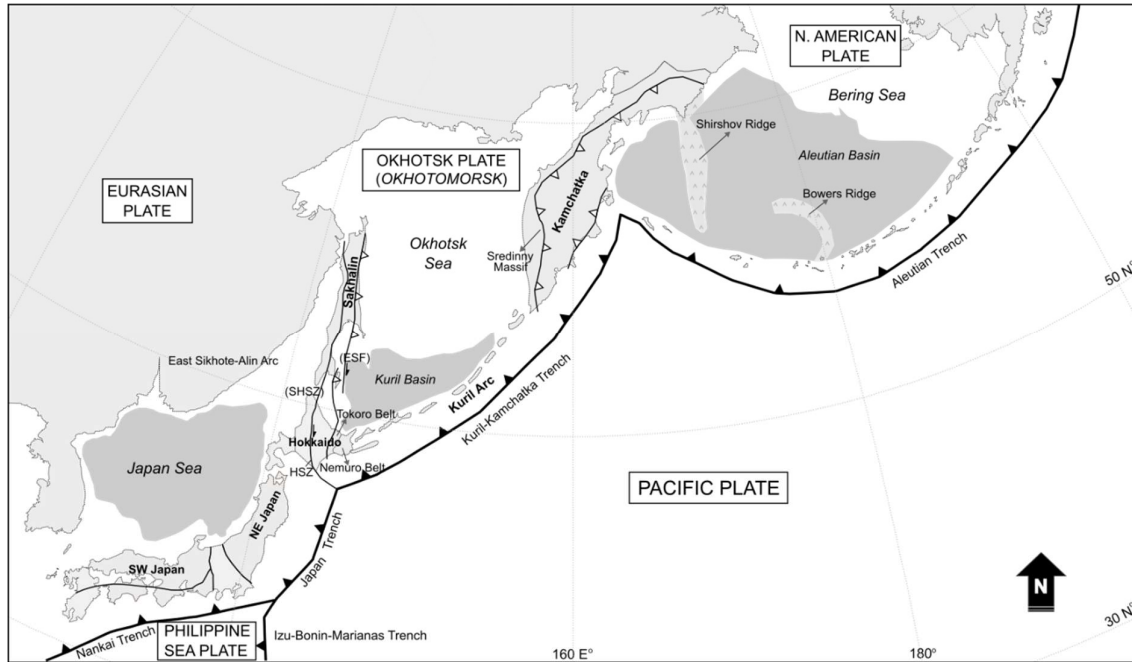


Figure 1. Schematic tectonic map of the NW Pacific region showing major tectonic plates (modified after Vaes et al., 2019). Abbreviations: ESF = East Sakhalin fault; HSZ = Hidaka Shear Zone; and SHSZ = Sakhalin-Hokkaido Shear Zone.

On the other side, there is a hypothesis that the relationship between the Izanagi and the Pacific Plates was a trench (Figure 2a) (Domeier et al., 2017). The presence of the trench was inferred based on the paleomagnetic measurements of deposits that were assumed to have accreted intra-oceanic arcs along the Izanagi-Pacific subduction zone during the Late Cretaceous (Domeier et al., 2017). Domeier et al. (2017) suggested that the reconstructed seismic tomographic profiles are also conformable to this hypothesis. Thus, this hypothesis suggests that once an oceanic ridge, the plate boundary was transformed into a subduction zone, and intra-oceanic magmatic arcs emerged on the Pacific Plate during the Cretaceous. Their traces are Tokoro (i.e., the Paleo-Kuril Arc in this study), Kronotsky, and Olutorsky Arcs, accreted along the peripheral zones of the Eurasian-Okhotsk Plates. However, this hypothesis

contradicts Seton et al. (2015) model (Figure 2b), which assumes ridge subduction. If their hypothesis is accurate, the ridge subduction has not occurred in the eastern margin of the Eurasia-Okhotsk Plates since the Cretaceous. Furthermore, igneous activity in the region during 60–50 Ma can be attributed to events other than ridge subduction.

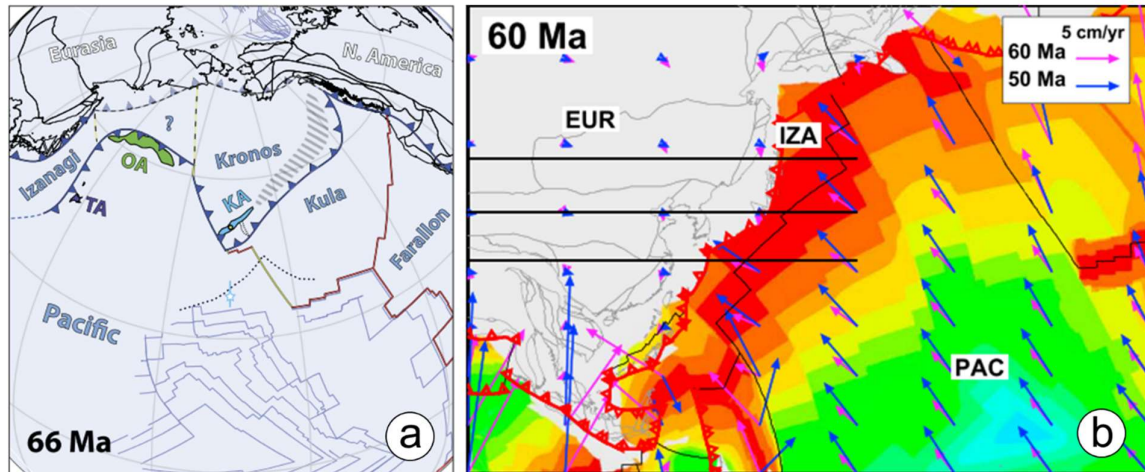


Figure 2. Tectonic model of the Izanagi-Pacific Plates during the Late Cretaceous to the Paleocene. a) The tectonic model by Domeier et al. (2017), showing the TA (Tokoro Arc) developed as an intra-oceanic arc system in the NW Pacific Ocean, and the relationship between the Izanagi and Pacific Plates at 66 Ma was a trench. Abbreviations: OA–Olyutorsky Arc, KA–Kronotsky Arc. b) Model from Seton et al. (2015) suggested an oceanic ridge existed between the Izanagi and Pacific Plates and predicted a ridge-transform intersection subducted to the eastern margin of Eurasian in the period ca. 60–50 Ma. Abbreviations: EUR–Eurasian, IZA–Izanagi, PAC–Pacific.

One of the critical terrains for this discussion is the Paleo-Kuril Arc (Kimura and Tamaki, 1985), which is named the Tokoro Arc by Domeier et al. (2017). This arc system is now exposed as the Nemuro and Tokoro belts in eastern Hokkaido, northern Japan. This terrain recorded the tectonic history of the Izanagi-Pacific Plates movements that occurred during the Late Cretaceous through Paleocene (Domeier et al., 2017; Müller et al., 2016; Seton et al., 2015). It was considered that the Paleo-Kuril Arc systems followed a complex trajectory to collide with the Paleo-Northeast Japan Arc system (Kimura and Tamaki, 1985; Kimura, 1994; Nanayama et al., 1993). The dextral motion between Paleo-Northeast Japan and the Paleo-Kuril Arc systems was suggested by the right-lateral shear zone extended from central Hokkaido to central Sakhalin (Figure 1). The shear zone is more than 2000 km long (Jolivet et al., 1992), so that several hundreds of kilometers of displacement is supposed to occur during

the active collisions between two arc systems. Strike-slip motion along this shear zone caused the tectonic bending of the western part of the Nemuro Belt of the Paleo-Kuril Arc that was rotated clockwise up to 73° in the Shiranuka Area (Hamano et al., 1986). This dextral movement was interpreted to have occurred due to the southwestward migration of the Kuril Arc system (Kimura, 1996). The Nemuro Belt was located several thousand kilometers northward from the current position before the collision if this interpretation is valid. However, the paleomagnetic measurements (Bazhenov et al., 2001; Bazhenov & Burtman, 1994; Domeier et al., 2017) suggested that the paleo-latitude of the Nemuro and Tokoro Belts were around 34.5° and 25° , respectively. These estimates imply that the Paleo-Kuril Arc was located southward from its current position. Therefore, they hypothesized that the Paleo-Kuril Arc was developed as an intra-oceanic island arc system in the north pacific region, and it migrated to the north after Late Cretaceous (after ~ 60 Ma). This hypothesis is widely accepted as a tectonic history of the Paleo-Kuril Arc system by various studies (e.g., Bazhenov et al., 2001; Bazhenov & Burtman, 1994; Domeier et al., 2017).

Despite these pioneering studies, the recent paleomagnetic study has cast serious doubt on their hypothesis about the origin of the Paleo-Kuril Arc. Katagiri et al. (2019) indicated that the clockwise rotation of the western part of the Nemuro Belt initiated at the timing of the unconformity between the Nemuro and Urahoro Group (ca. 60 to 40 Ma) in the Nemuro Belt, which is much older than the period previously supposed. The dextral motion between Paleo-Northeast Japan and the Paleo-Kuril Arc systems was suggested by the right-lateral shear zone called as Hidaka Shear Zone that extends from central Hokkaido to the central Sakhalin (Figure 1). The shear zone is more than 2000 km long (Jolivet et al., 1992). This strike-slip motion along this shear zone could be related to the opening of the back-arc basin (Kuril Basin) (Maeda, 1990). This translation of the terrains caused the tectonic bending of the western part of the Paleo-Kuril Arc that rotated clockwise up to 73° in the Shiranuka Area, eastern Hokkaido (Hamano et al., 1986).

Thus, if the Paleo-Kuril Arc system was developed as an intra-oceanic arc in the Pacific, the arc system should have migrated northward to collide with the continental crust of the eastern margin of Asia (Okhotsk or Eurasian Plates) before its southward transformation. This second stage of the southward migration was supposed to occur at the Late Oligocene (25 Ma) to the middle Miocene (15 Ma) (Jolivet & Miyashita, 1985; Kimura, 1994). However, Katagiri et al. (2019) showed that the dextral motion at the boundary between two arc systems occurred immediately after the deposition of the Nemuro Group of the Paleo-Kuril Arc. The continuity

between the formation of the volcanic arc and its dextral movement means that the two-step movement hypothesis, in which the intra-oceanic arc moved north and then south, is unlikely to be valid. Instead, it is more natural to assume that the Paleo-Kuril Arc emerged as a continental arc, which later migrated southward to become the island arc. As for the paleomagnetic inclination, they reported that the paleo-latitude of the Urahoro Group was about the current position, based on a comparison with a 50 Ma paleopole of the apparent polar wandering path (APWP) of East Asia.

The origin of sediment particles in the Paleo-Kuril Arc can be a key to testing whether the hypothesis that the Paleo-Kuril Arc was intra-oceanic in the Pacific Ocean is valid. Suppose it was initiated as an intra-oceanic arc. In that case, its forearc deposit should contain no sediment particles originating from the stable platform or cratons. Suppose the Paleo-Kuril Arc was developed as the continental arc of the Okhotsk Plate. In that case, it is expected that deposits in the arc yield the sediment particles exhibiting Precambrian ages, which are indicative of the sediment input from the continental cratons. Thus, the sediment provenance analysis can provide critical information to reconstruct the tectonic history of the origin of the arc system and the plate tectonic framework of the Northwestern Pacific region.

1.2 U-Pb Age of Detrital Zircon Grains as a Tool for Provenance Analysis

Zircon (ZrSiO_4) is one of the most important minerals in geochronology. It is particularly suitable for U–Th–Pb geochronology (Ireland & Williams, 2003). Zircon is a physically and chemically robust mineral that crystallizes under various geological conditions, incorporating trace U and Th but little or no Pb (Ireland & Williams, 2003). Radiometric age dating of this mineral has become an important research method for at least the last seventy years, since the first issue of the *Journal of Sedimentary Petrology* in May 1931 (e.g., Fedo et al., 2003; Tyler, 1931). In the last 20 years, at least hundreds of publications utilized the detrital zircon grains for a study, indicating growing success in analyzing provenance sources, paleogeography, and tectonic reconstructions (Fedo et al., 2003). Some highlighted studies that illustrate the application of detrital zircon analysis such as (1) determining the maximum depositional age (e.g., Dickinson & Gehrels, 2009), (2) provenance analysis of sediment (e.g., Dickinson et al., 2012; Gehrels & Dickinson, 1995; Ishizaka et al., 2021), (3) paleogeographic reconstructions (e.g., Nugraha & Hall, 2018; Zhao et al., 2017), and (4) tectonic evolution (e.g., Cawood et al., 2012; Isozaki et al., 2010; Zhao et al., 2018).

The detrital zircon age distribution in sandstones is a well-established approach to identifying the provenances of the sedimentary rocks (e.g., Dickinson et al., 2012; Fedo et al., 2003; Gehrels & Dickinson, 1995). Investigating detrital zircon becomes more critical in interpreting the composition and history of modern and ancient sediments because it is a very robust mineral and occurs in the sedimentary deposits originating from granitic or metamorphic rocks. Hence, it provides a critical link in understanding the source history of a deposit (Fedo et al., 2003).

The U-Pb dating can be applied to the detrital zircon grains to obtain age distributions of sedimentary grains, providing essential sediment provenance information. LA-ICP-MS (Laser Ablation–Inductively Coupled Plasma–Mass Spectrometry) is one of the geochemical instruments useful for U-Pb dating of detrital zircon. This instrument quickly measures the isotopic ratio composition of various elements in zircon particles so that large amounts of data sets for the age spectra of detrital zircon have been produced by it (e.g., Cawood et al., 2012; Dickinson et al., 2012; Fedo et al., 2003). The dating by ion probe can achieve an analytical precision that is only an order of magnitude worse than the conventional isotope ID-TIMS dating technique. The method does not need the chemical treatment of samples before the analysis.

The other standard analytical methods used for U-Th-Pb geochronology are ID-TIMS (Isotope Dilution–Thermal Ionization Mass Spectrometry) and SIMS (Secondary Ion Mass Spectrometry). ID-TIMS is a powerful technique for resolving the chronology of geological events on the earth. This method is one of the most accurate and precise isotopic techniques because it is relatively insensitive to chemical yields or mass spectrometric sensitivity (Parrish & Noble, 2003). SIMS is a versatile technique for measuring the chemical and isotopic composition of solid materials on a scale of a few microns (Ireland & Williams, 2003). The SIMS instrument most common in geoscience is the ion microprobe, which uses a focused primary ion beam in static or scanning mode to sample target areas, usually 10- to 50- μm diameter (Ireland & Williams, 2003).

However, this study requires determining the age of each of the many zircon particles. Because of this requirement, this study adopted LA-ICPMS as the analytical method because it requires fast and large amounts of measurements rather than ultra-high precision or ultra-small area measurements.

1.3 Research Objective

The objective of this study is to verify whether the hypothesis that the PKA system developed as an intra-oceanic magmatic arc system along the boundary between the Izanagi and Pacific Plates or at the margin of a continental plate is adequate. The origin of the Paleo-Kuril Arc system (the Nemuro and Tokoro Belts) will answer whether the subduction of the Izanagi Plate occurred with the ridge subduction as proposed by Seton et al. (2015) or as the trench subduction as proposed by Domeier et al. (2017).

To this end, this study provides the first results of the detrital zircon U-Pb analyses from sedimentary rocks in the PKA system (Nemuro & Tokoro Belts), which will provide the implication to answer the above main questions. The age distribution of the detrital zircon can be a clue to the origin of the Paleo-Kuril Arc system (the Nemuro and Tokoro Belts) in the Late Cretaceous, focusing on the link of the arc system with the continental crust.

2 Detrital Zircon U-Pb Ages from Late Cretaceous to Paleogene Sandstones of the Nemuro and Urahoro Groups in the Nemuro Belt Complex, Eastern Hokkaido, Northern Japan: Implication for the Late Cretaceous Evolution of the Paleo-Kuril Arc in the Northwestern Pacific Region

2.1 Introduction

The Hokkaido junction is the arc-arc collision zone where the lower crust has been exposed due to the collision (Kimura, 1996). Many studies have investigated the genetic process of arc-arc junctions in Hokkaido between the Paleo-Northeast Japan Arc and the Paleo-Kuril Arc systems (Kimura, 1994; Kimura, 1996). The Paleo-Northeast Japan Arc system is considered to be a stable terrane and belongs to the Eurasian Plate, whereas the Paleo-Kuril Arc system is regarded as a forearc sliver and belongs to the Okhotsk Plate, which moved southwestward and collided with the Paleo-Northeast Japan Arc system (Kimura, 1994). The Paleo-Kuril Arc system in Hokkaido Island is divided into two belts zonation, the Nemuro Belt at the eastern tip and the Tokoro Belt at the western tip (Figure 3c).

The origin of sediment particles in the Paleo-Kuril Arc can be a key to testing whether the hypothesis that the Paleo-Kuril Arc was intra-oceanic in the Pacific Ocean is valid. Suppose it was initiated as an intra-oceanic arc. In that case, its forearc deposit should contain no sediment particles originating from the stable platform or cratons. For instance, it is known that the forearc deposits of the Izu-Bonin Arc, which is the intra-oceanic arc between the Pacific and the Philippine Sea Plates, only contain detrital zircons exhibiting almost syn-depositional ages (Isozaki et al., 2010). In contrast, Precambrian detrital zircons are abundant in sandstones deposited before the Late Cretaceous in the Southwest and Northeast Japan Arc systems that were continental arc systems linked with the North China Craton (e.g., Isozaki et al., 2010). The basement rock of the Okhotsk Plate is partially exposed as the Sredinny Massif in the Kamchatka Peninsula, which yields abundant zircon grains exhibiting Precambrian ages (Bindeman et al., 2002). Suppose the Paleo-Kuril Arc was developed as the continental arc of the Okhotsk Plate. In that case, it is expected that deposits in the arc also yield the Precambrian zircons. Thus, the sediment provenance analysis can provide critical information to reconstruct the tectonic history of the origin of the arc system and the plate tectonic framework of the Northwestern Pacific region.

Here, we provide the first report of the U-Pb zircon geochronological data of the Late Cretaceous to Paleogene successions in the Nemuro Belt of the Paleo-Kuril Arc. Eleven sandstone samples were collected from the Nemuro and Urahoro Groups in the Nemuro Belt. This study conducted U-Pb dating of detrital zircon grains using a laser ablation–inductively coupled plasma–mass spectrometry (LA-ICP-MS). Then, the abundant detrital zircons exhibiting the Precambrian ages were detected in the samples of the Late Cretaceous sandstones, which indicates that the Paleo-Kuril Arc was developed as a continental rather than an intra-oceanic arc system. Based on these geochronological datasets, this study argues the provenance sources and the evolution of the Paleo-Kuril Arc system.

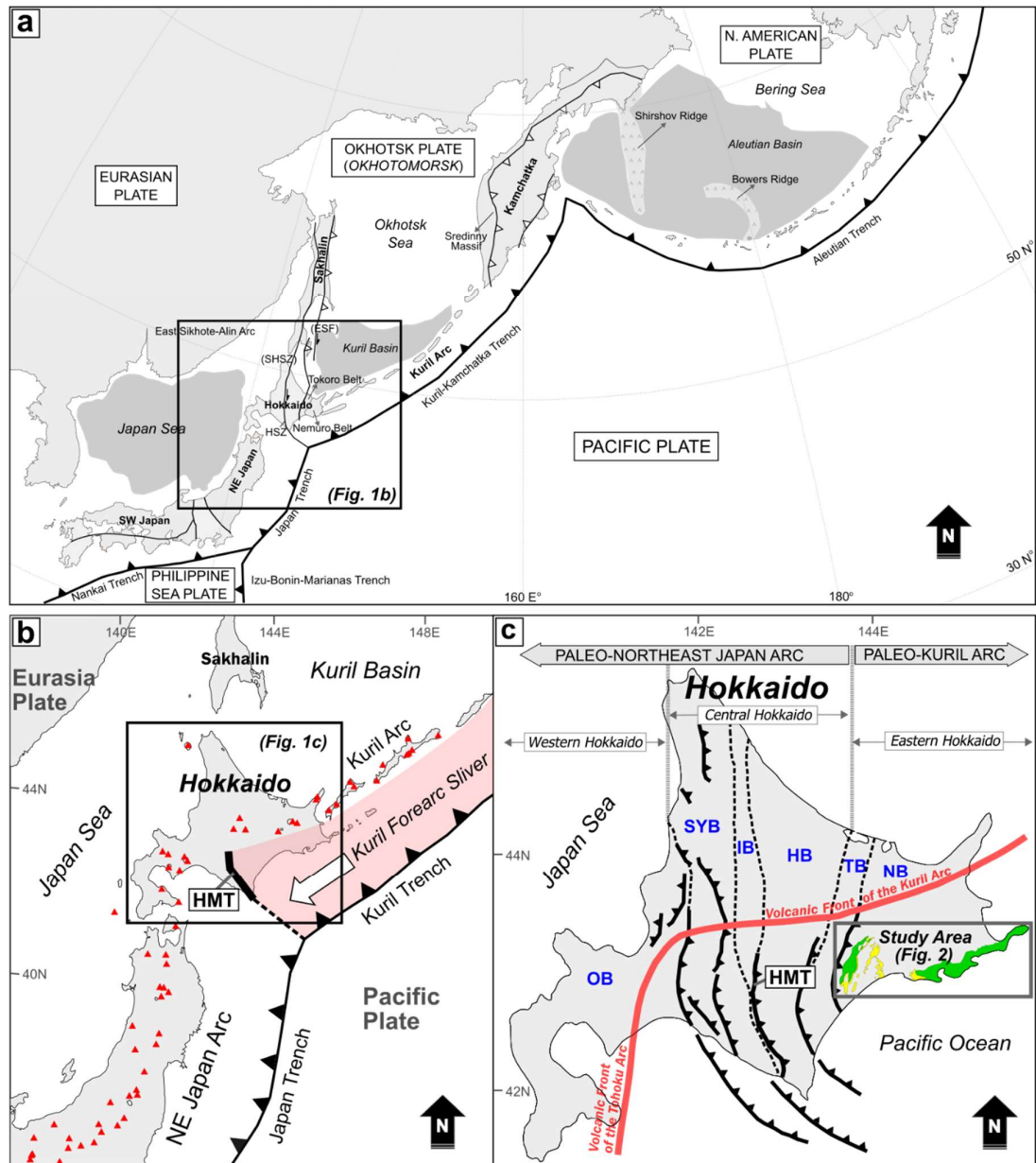


Figure 3. Schematic map of East Asia (a) Tectonic framework for northwest Pacific region (modified after Vaes et al., 2019). Abbreviations: ESF = East Sakhalin fault; HSZ = Hidaka Shear Zone; and SHSZ = Sakhalin-Hokkaido Shear Zone. (b) A tectonic map of the arc-arc junction of Hokkaido, with a pink color area, indicates a forearc sliver (modified after Hua et al., 2019; Kusunoki & Kimura, 1998). The red triangles indicate active volcanoes. Abbreviation: HMT = Hidaka Main Thrust. (c) Tectonic setting and tectonostratigraphic zonation of Hokkaido (modified after Iwasaki et al., 2004; Naruse, 2003). Stratigraphy: green = Nemuro Group; yellow = Urahoro Group. Abbreviations: HB = Hidaka Belt; HMT = Hidaka Main Thrust; IB = Idonnappu Belt; NB = Nemuro Belt; OB = Oshima Belt; SYB = Sorachi-Yezo Belt; TB = Tokoro Belt.

2.2 Geologic Background

2.2.1 Plate Tectonic Framework

Two continental plates surround the Kuril Arc's tectonic configuration in eastern Hokkaido: the Okhotsk (i.e., Okhotomorsk Block) and the Eurasia Plates (Zhao, Alexandrov, Jahn, & Ivin, 2018). The Okhotsk Plate has been considered a continental block and lies underneath the Okhotsk Sea (Jolivet, 1986, 1987; Maruyama et al., 1997; Zhao, Alexandrov, Jahn, & Ivin, 2018). A geophysical study in the Central Okhotsk Rise region revealed that the Okhotsk Plate was composed of the continental crust. It consists of granitic and basaltic layers about ten and 15 km thick, respectively (Verzhbitsky & Kononov, 2006). Several grabens elongated from west to east are observed in this continental block. The north-south trend faults are observed in the western part of the Okhotsk Sea, presumably associated with the Sakhalin-Hokkaido dextral shear zone (Worrall et al., 1996). The Eurasia Plate (continental plate) is situated in the west of the Okhotsk Plate (Figure 3a) and is composed of an assemblage of several cratons: North China Craton (NCC), South China Craton (SCC), and Siberian Craton (Zhao, Wang, Huang, Dong, Li, Zhang, & Yu, 2018). The Pacific Plate is subducting beneath these continental plates (Figure 3a). The Kuril Arc-Trench system develops (Figure 3a and 3b) along the Pacific and the Okhotsk Plates subduction zone. The Kuril Basin locates between the Kuril Arc and Okhotsk Plate (Figure 3a) and has been interpreted as a fan-shaped back-arc basin (Kimura & Tamaki, 1985; Maeda, 1990).

The velocity data from GEONET indicated that the crustal deformation of Hokkaido is dominated by westward motions representing the northwestward subduction of the Pacific Plate underneath the Kuril Arc (Sagiya et al., 2000; Taira, 2001). Oblique subduction of the Pacific Plate to the Kuril Arc caused southwestward migration of the Kuril forearc (Kuril forearc sliver) (Figure 3b) in the late Miocene and associated with the strike-slip fault movement between the volcanic front and the Kuril Arc (Kimura, 1986, 1994; Kusunoki & Kimura, 1998). The southwestward movement of the forearc sliver of the Kuril Arc formed a collision zone in central Hokkaido. It resulted in a Hidaka collision zone (HMT or Hidaka Main Thrust) and volcanic front of the Kuril Arc (Figure 3b and 3c) (Kimura, 1986, 1994; Taira, 2001).

It is estimated that the arrangement of these plates was substantially different in the past. In the Cretaceous, the Paleo-Pacific Ocean (i.e., in the northern region) was resided by five major plates: the Izanagi, Kronos, Kula, Farallon, and Pacific Plates (Domeier et al., 2017).

Particularly in the Northwestern Pacific region, the major oceanic plates were the Izanagi and Pacific Plates during the Cretaceous. Then the Izanagi Plate completely vanished due to subduction to the eastern continental margin of Asia until the Eocene (ca. 50–40 Ma) (Domeier et al., 2017; Müller et al., 2016; Seton et al., 2015). After this period, the configuration of the oceanic plates in this region did not change considerably (Vaes et al., 2019).

2.2.2 Two Paleo-Arc Systems in Hokkaido

The unique tectonic setting of eastern Hokkaido is the junction of two arc systems: the Northeast Japan Arc and the Kuril Arc Systems. The terrains in Hokkaido Island have been subdivided into tectonic belts belonging to two paleo-arc systems: The Paleo-Northeast Japan Arc (Paleo-NE Japan Arc) and Paleo-Kuril Arc systems (Figure 3c) (Kimura & Tamaki, 1985; Segawa & Furuta, 1978). Moreover, six major tectonic belts in these two terrains are identified based on tectonic setting, depositional ages, and facies analyses (Kiminami, 1986; Kimura, 1996). The Paleo-Kuril Arc is subdivided into the Nemuro and Tokoro Belts from east to west. The Paleo-NE Japan Arc is divided into the Idonnappu, Sorachi-Yezo, and Oshima Belts (Figure 3c). The Hidaka Belt is the collisional zone of these two paleo-arc systems.

The terrains of the Paleo-NE Japan Arc system are exposed from the central to western parts of Hokkaido and continue to the northern Sakhalin. The Oshima, Sorachi-Yezo, and Idonnappu Belts (Figure 3c). The Oshima Belt comprises the late Jurassic *mélange* with Triassic and late Paleozoic limestone and chert (Kiminami et al., 1986). The tectonic setting of this belt is interpreted as the ocean-continent plate boundary in the Jurassic and changed to be a magmatic arc region during the Early Cretaceous (Kiminami et al., 1986). The Sorachi-Yezo Belt consists of the Sorachi and Yezo Groups. The Yezo Group conformably overlies the Sorachi Group. The Yezo Group is characterized by the Lower to Upper Cretaceous terrigenous clastics and has been interpreted as a forearc deposit. Furthermore, the Sorachi-Yezo Belt is composed of greenstone, the Upper Jurassic chert, and the Cretaceous deposits with tuff beds (Kiminami et al., 1986). The Sorachi Group is interpreted as an accretionary complex or oceanic crust transformed into the forearc basin (Kiminami et al., 1986). The Idonnappu Belt is characterized by *mélange* deposits containing chert and limestone blocks of various ages (Kimura, 1994).

The Hidaka Belt consists of the accretionary complex (Kiminami et al., 1986) and the metamorphic rocks exposed in the southern part of the Hidaka Belt (Hidaka Mountains). The

metamorphic rocks in the Hidaka Belt are granulite to upper metamorphosed sedimentary rocks (Kimura, 1994). The Hidaka Belt represents the collision zone between two subduction systems developed until the Late Cretaceous (Kiminami et al., 1986; Kimura, 1994).

The Paleo-Kuril Arc system is exposed in the eastern part of Hokkaido, consisting of the Tokoro and Nemuro Belts. The Tokoro Belt is the Late Jurassic to Late Cretaceous sedimentary complex consisting of greenstone, limestone, chert, and terrigenous rocks (Bamba, 1984; H. Okada et al., 1989). The detailed characteristics of the Nemuro Belt are described in the following section.

2.2.3 Stratigraphy of the Nemuro Belt

The Nemuro Belt is situated in eastern Hokkaido (Figure 4a). It comprises the Upper Cretaceous to Paleogene Nemuro Group, the Eocene Urahoro Group, and the Oligocene Onbetsu Group. Boundaries between these groups are unconformity. This study investigates detrital zircon age distribution from the Nemuro and Urahoro Groups. The stratigraphy of these two groups is described below.

The Nemuro Group has been recognized as a forearc basin sedimentary sequence, consisting of a marine clastic sequence with a thickness that can reach approximately 3000 m (Kiminami, 1978, 1983; Naruse, 2003). The group is unconformably overlain by the Urahoro Group (Kiminami, 1983). The depositional age of the group ranges from the Late Cretaceous (Campanian) to Paleocene. This group is well exposed along the coastal area of eastern Hokkaido from Nemuro city to Kombumori city (Figure 4a). The Nemuro Group has been subdivided into nine formations: the Nokkamappu, Otadai, Monshizu, Oborogawa, Hamanaka, Akkeshi, Tokotan, Kiritappu, and Shiomi Formations, from older to younger. The group's middle to upper parts (above Oborogawa Formation) exhibit the upward-coarsening succession, suggesting regression from the submarine fan's distal part to the shelf-edge environments (Naruse, 2003). This study observed four formations in the Nemuro Group: the Hamanaka, Akkeshi, Kiritappu, and Shiomi Formations (Figure 5).

The Nokkamappu Formation (Figure 4f) is the lowermost part of the Nemuro Group. This formation consists of tuff breccia, dolerite or basalt sill, lava and batholith, andesite lava, and sedimentary rocks, e.g., conglomerate, sandstone, and shale (Kiminami, 1983). The age of this formation was considered to be the Late Cretaceous (Campanian to Maastrichtian) on the basis mollusca (*Inoceramus schmidtii* and *I. shikotanensis*) analysis (T Matsumoto, 1970).

Similar age was also confirmed from nannofossils analysis and considered to be Late Cretaceous (middle to upper Campanian) (H. Okada et al., 1987). In addition, Shibata (1986) reported that the ages of the Nokkamappu Formation from dolerite and basalt (volcanic rocks) were recorded at 75–76.2 Ma and 72–73.9 Ma based on the K-Ar ages, respectively. This formation has a thickness of about 0.5 km and is interpreted as a shallow water environment (Kiminami, 1983).

The Hamanaka Formation (Figure 4d) is around 200 m thick and composed of alternating sandstone beds and shale (Kiminami, 1978, 1983). The depositional age of the Hamanaka Formation was considered to be the late Cretaceous (i.e., the lower Maastrichtian) based on the occurrence of ammonite fossils (*Gaudryceras* sp.) (Figure 5) (Naruse et al., 2000). This formation was interpreted as the proximal basin plain (Figure 5) (Naruse, 2003).

The Akkeshi Formation (Figure 4d) comprises two successions: thin-bedded alternation of sandstones and mudstones and thick-bedded massive sandstones. These successions correspond to the submarine levee and channel facies (Figure 5) (Naruse, 2003). The age of the Akkeshi Formation was considered to be the Late Cretaceous (i.e., the lower Maastrichtian) based on molluscan fossils (*Gaudryceras hamanakense*, *Pachydiscus flexuosus*, *Tetragonites popetensis*, and *Sphenoceras hetonaianus*) (Figure 5) (Naruse et al., 2000). Analysis of nannofossils in the upper part of the Akkeshi Formation suggested Danian (Zone CP2) in age (Figure 5) (Okada et al., 1987).

The Tokotan Formation is around 100-150 m thick and composed of interbedded shale and sandstone (Kiminami, 1983). The sandstone contains mafic minerals, with slumps observed (Kiminami, 1983). This formation has been interpreted as the Late Cretaceous (Maastrichtian) based on the presence of Ammonites (Tatsuro Matsumoto et al., 1979), while nannofossils analysis was considered to be Paleocene (Danian) (Figure 5) (H. Okada et al., 1987).

The Kiritappu Formation (Figure 4e) has a total thickness of around 400 m and composes mainly of conglomerates. Some other areas consist of shales, sandstones, and volcanic rocks (Kiminami, 1983). The age of this formation was considered to be Paleocene (Danian) based on nannofossils analysis (Figure 5) (H. Okada et al., 1987). This formation has been interpreted as submarine slope deposits (Naruse, 2003).

The Shiomi Formation (Figure 4b) is the uppermost formation of the Nemuro Group. It is unconformably overlain by the Beppo Formation of the Urahoro Group. This formation is

characterized by mud-prone alternating beds of sandstone and mudstone with minor intercalation of conglomerates (Okazaki & Nagahama, 1963). The age of this formation was considered to be the middle Paleocene (Zone CP5 and CP6) based on nannofossils analysis (Figure 5) (Okada et al., 1987), while Okada et al. (1987) suggested that the Shiomi Formation contains the early Eocene.

Paleocurrent directions were measured in the Kiritappu, Hamanaka, and Akkeshi Formations of the Nemuro Group using the cross-stratification of sandstones, sole marks, and imbricated conglomerates. The paleocurrent data in the Nemuro Group indicate that the deposits were transported from north/northwest toward the south and southeast (Naruse, 2003). In the Hamanaka and Akkeshi Formations, the paleocurrents are oriented toward the southeast and south (Figure 6) (Naruse, 2003). In the Kiritappu Formation, the paleocurrent data also indicated the direction toward the southeast (Naruse, 2003).

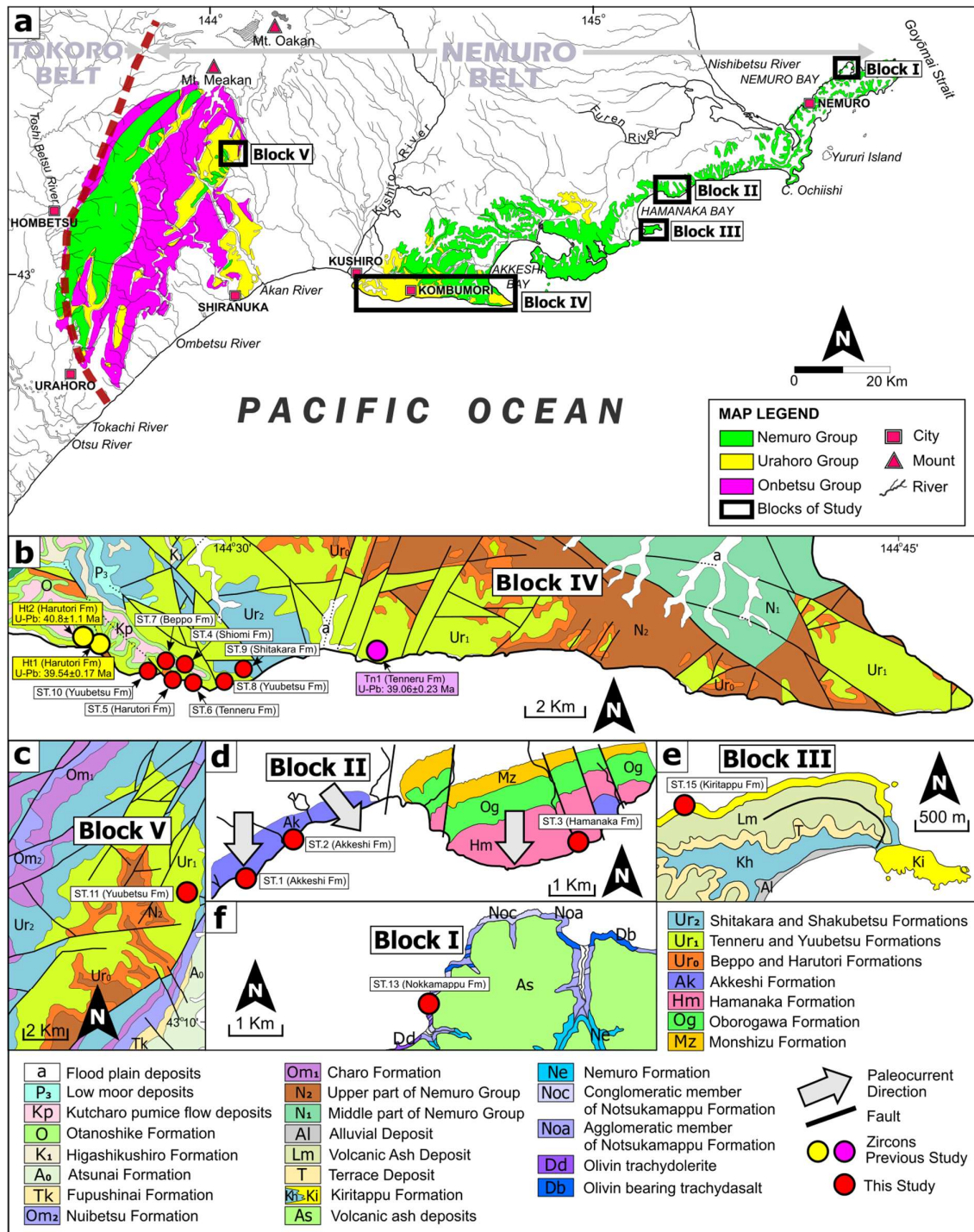


Figure 4. Geological map of the study area (a) Geological map of the Nemuro Belt complex and the most eastern edge of the Tokoro Belt (modified after Yamaguchi et al., 1978). The map shows the distribution of three groups of the Nemuro Belt: Nemuro Group (green color), Urahoro Group (yellow color), and Onbetsu Group (purple color). Black squares show the blocks of the study area. (b) the study area of block IV with sampling locations (red-filled rounds) and previous zircon studies (yellow and purple-filled rounds). (c) the study area of

block V with sampling location (red-filled round). (d) the study area of Block II with sampling locations (red-filled rounds) and paleocurrent directions (gray arrows). (e) the study area of Block III with a sampling location (red-filled round). (f) the study area of Block I with sampling location (red-filled round). Blocks I to V were modified from GeomapNavi, 2022 <https://gbank.gsj.jp/geonavi/datastore/>.

The Urahoro Group is a Paleogene succession of non-marine to marine clastic deposits in the Nemuro Belt. The group is well exposed in the eastern Hokkaido area, particularly in the Kushiro, Kombumori, and Shiranuka areas (Figure 4a). It is mainly composed of clastic deposits (e.g., conglomerate, sandstone, and siltstone) and tuff layers (Matsui, 1962; Tanai, 1970) with coal seams. The total thickness of this group is approximately 900 m (Tanai, 1970). The group is subdivided into six formations: from older to younger, the Beppo, Harutori, Tenneru, Yuubetsu, Shitakara, and Shakubetsu Formations. The depositional environments of this group have been interpreted to be alluvial to shallow marine environments (Matsui, 1962; Tanai, 1970) (Figure 5). Recent studies of the U-Pb age of tuff beds and paleomagnetic stratigraphy revealed that the age of the Urahoro Group is the Middle Eocene (Katagiri et al., 2016, 2019). This study investigated five formations from the Urahoro Group, i.e., the Beppo, Harutori, Tenneru, Yuubetsu, and Shitakara Formations (Figure 5).

The Beppo Formation (Figure 4b) is the lowermost formation of the Urahoro Group. It unconformably overlies the Shiomi Formation of the Nemuro Group. It is characterized mainly by the occurrence of the basal conglomerate (Matsui, 1962; Tanai, 1970). The depositional environment of the Beppo Formation is interpreted to be terrestrial (Figure 5) (Matsui, 1962).

The Harutori Formation (Figure 4b) consists of alternating sandstone and siltstone beds intercalated with tuff and coal layers (Matsui, 1962; Tanai, 1970). The thickness of this formation exceeds 100 m (Tanai, 1970). The depositional environment of this formation is interpreted as alluvial rivers (Figure 5) (Matsui, 1962). Analysis of U-Pb geochronology of zircon grains from tuff beds indicated 39.54 ± 0.17 Ma (Bartonian) and 40.8 ± 1.1 Ma (Bartonian), which correspond to the middle Eocene (Figure 5) (Katagiri et al., 2019).

The Tenneru Formation (Figure 4b) is characterized by conglomerates with intercalations of sandstones, siltstones, and coal layers (Matsui, 1962; Tanai, 1970). Thin layers of acidic tuff (Katagiri et al., 2016) are observable. The depositional environment of this formation is interpreted as terrestrial (Figure 5). Still, a small locality of brackish or marine

environments also developed in the upper part of the Tenneru Formation (Matsui, 1962). The latest study by zircon U-Pb analysis from the tuff layer resulted in 39.06 ± 0.23 Ma, which aligns to the middle Eocene (Figure 5) (Katagiri et al., 2016).

The Yuubetsu Formation (Figure 4b) is subdivided into the Lower and Upper Members (Figure 5). It comprises sandstone, siltstone, and conglomerate rocks, with intercalated coal seams (Matsui, 1962; Tanai, 1970). The maximum thickness of this formation is approximately 250 m (Tanai, 1970). The depositional environment is interpreted as terrestrial (Figure 5) (Matsui, 1962). The flora fossils analysis has constrained the age of this formation, indicated to be middle Oligocene (Figure 5) (Tanai, 1970).

The Shitakara Formation (Figure 4b) is subdivided into three members, the Lower, Middle, and Upper Members, based on lithology and fossils compositions (Tanai, 1970). The formation is mainly composed of sandstone and siltstone rocks, with a maximum thickness exceeding 300 m (Tanai, 1970). This formation is interpreted as deposits in brackish to marine environments (Figure 5) (Matsui, 1962). The age of the Shitakara Formation was suggested as Eocene by nannofossils and dinoflagellate analyses. The nannofossils analysis showed the middle Eocene (Okada & Kaiho, 1992), and the dinoflagellate cysts implied the late Eocene (Figure 5) (Kurita, 2004).

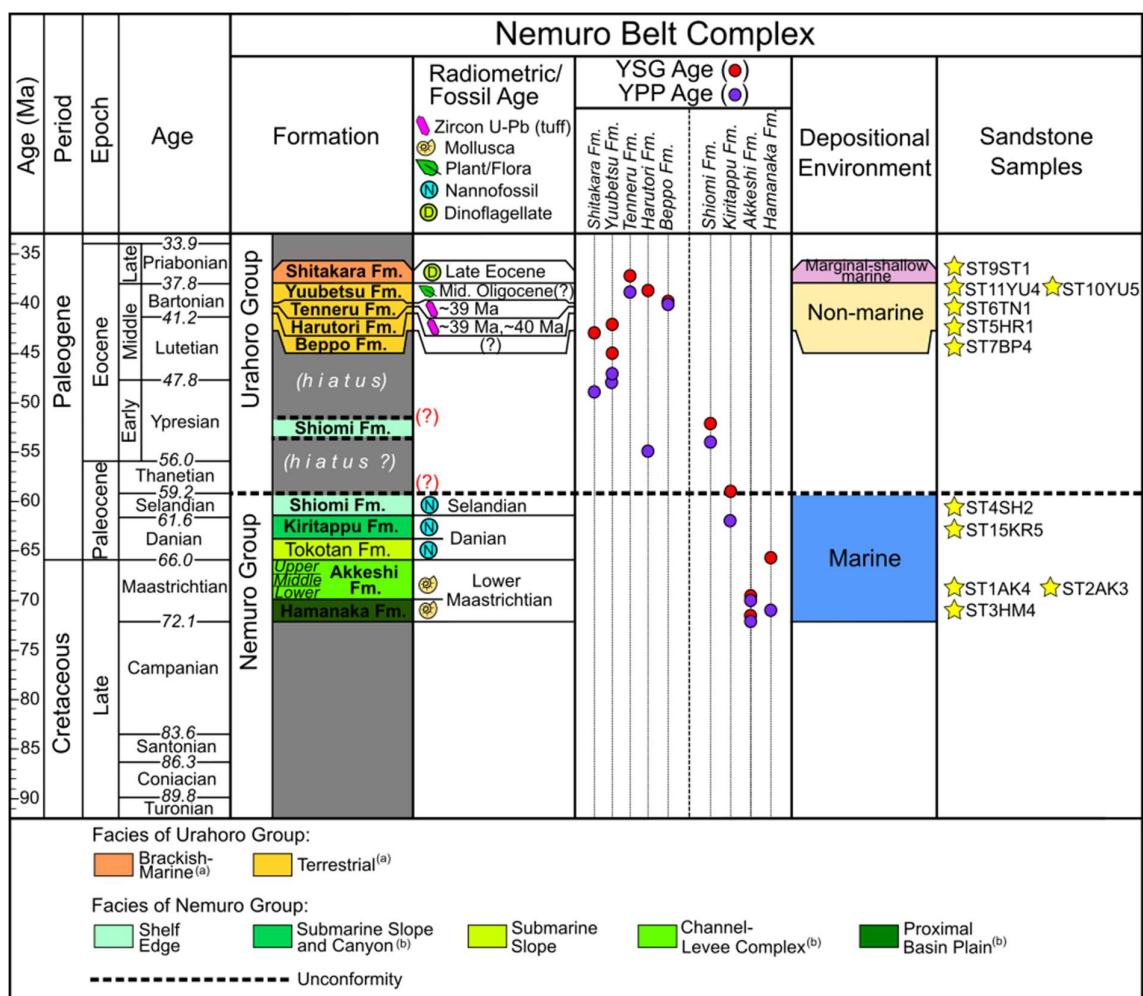


Figure 5. The stratigraphic column of the Nemuro and Urahoro Groups (based on Kiminami, 1983; Matsui, 1962; Okada et al., 1987). Names of sampled stratigraphic units are shown in bold type. U-Pb zircon ages two members are indicated by color: purple (Katagiri et al., 2016, 2019), and fossil ages by reference: mollusca (Naruse et al., 2000); plant/flora (Tanai, 1970); nannofossil (Okada et al., 1987); dinoflagellate (Kurita, 2004). Geological age was adopted from Geologic Time Scale (Walker et al., 2013). Abbreviations: Fm. = Formation, YPP = Youngest Graphical Peak; YSG = Youngest Single Grain.

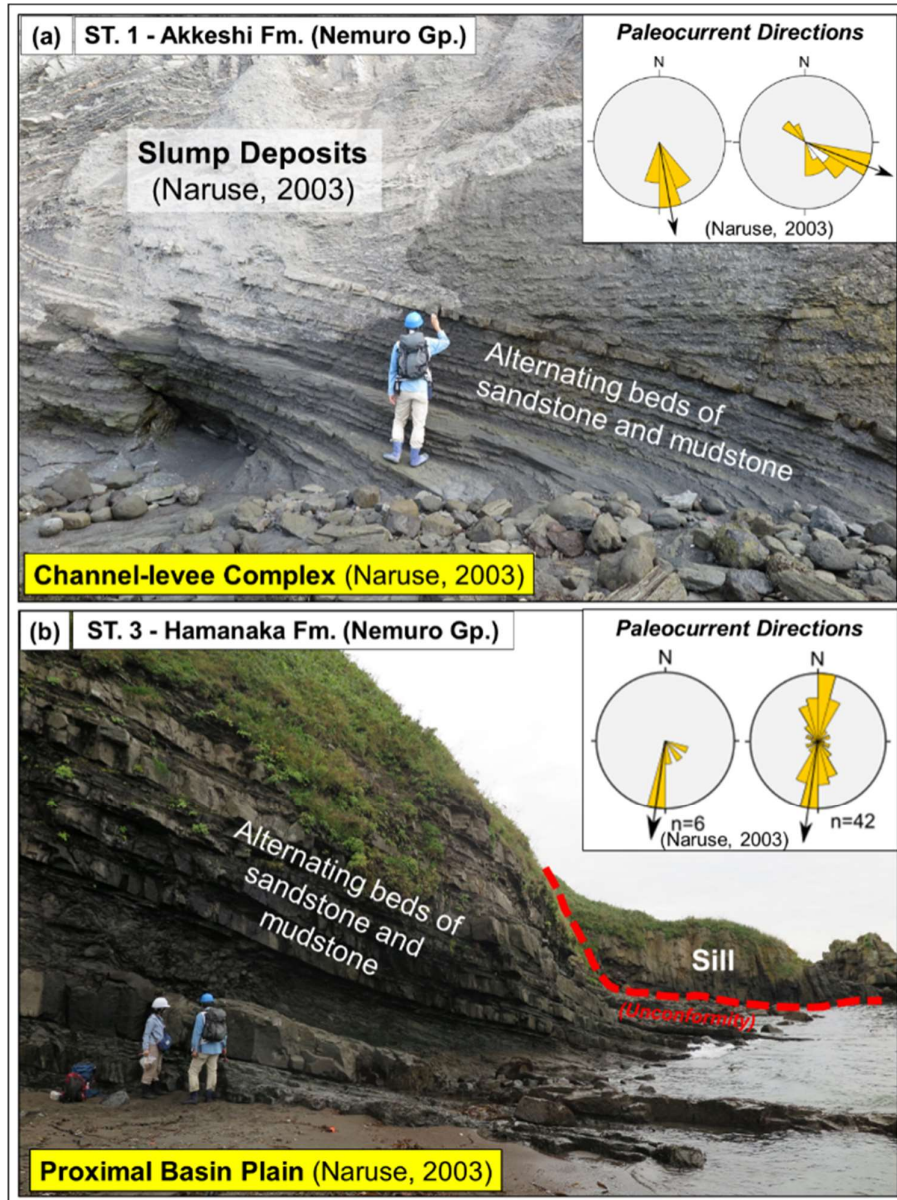


Figure 6. Selected field outcrop photos and paleocurrent data from Nemuro Group. (a) Outcrop photo from Akkeshi Formation, and (b) outcrop photo from Hamanaka Formation. Interpretations of outcrops and paleocurrent directions were adopted from Naruse (2003). Abbreviations: ST. = Station, Fm. = Formation, Gp = Group.

2.3 Sampling and Analytical Methods

2.3.1 Sampling

To understand the provenance sources of the Nemuro Belt complex, this study measured four formations within the Nemuro Group (i.e., Hamanaka, Akkeshi, Kiritappu, and

Shiomi Formations) and five formations within the Urahoro Group (i.e., Beppo, Harutori, Tenneru, Yuubetsu, and Shitakara Formations). The samples have various grain sizes ranging from fine to coarse sandstones, but most were medium-grained. The information on sample stations for detrital zircon U-Pb analysis in the Nemuro Belt of the Paleo-Kuril Arc is shown in Appendix 6.1.

2.3.2 Detrital Zircon U-Pb Geochronology

Detrital zircon grains were separated using the standard mineral separation techniques at Kyoto University. The first process was rock fragmentation, where sandstone samples were crushed using a mortar rock crusher and were sieved with 246 μm mesh. The second process was micro-separation, which involved panning, magnetic separation to separate grains from magnetic minerals, and gravity separation using a heavy Sodium Polytungstate (NaPT) solution. About 200 zircon grains from each sample were mounted under a binocular microscope, embedded in a 10 mm epoxy resin disk, and continued to polish process to approach half of the zircon grains thickness. I mounted zircons in different grain sizes and shapes to obtain age information in this study. The zircon imaging process was conducted through two steps. The first step was to photograph zircon grains under transmitted light and reflected light using an optical microscope. The second step was to take images of cathodoluminescence (CL) and backscattered electron (BSE) using JEOL Superprobe JXA-8105 at the Laboratory of the Department of Petrology and Mineralogy, Kyoto University. These CL and BSE images were purposed to observe the internal structure of zircon grain for defining the potential target spots for U-Pb dating.

For U-Pb dating, zircon sampling was made using a 260 nm femtosecond laser ablation system (i.e., Jupiter solid nebulizer, ST Japan INC.) connected to a triple quadrupole ICP-MS (iCAP TQ, Thermo Fisher Scientific, Bremen, Germany). Generally, the femtosecond laser prompts the downsizing of laser-induced aerosols to suppress Pb/U fractionation during the laser ablation (Makino et al., 2019; Yokoyama et al., 2011). The laser fluence of 3.5–4.0 J cm^{-2} and the repetition rate of 20 Hz was used for a raster ablation of 20 $\times$ 20 μm square area. Helium gas (0.6 L min^{-1}) was used as a carrier gas, improving sample transport efficiency from the sample cell to the ICP (Eggins et al., 1998; Günther & Heinrich, 1999). An Ar make-up gas was admixed at the exit of the sample cell at a flow rate of 0.85–0.91 L min^{-1} . As for instrumental parameters of the ICP-MS, the torch position and lens voltages were optimized to achieve the maximum signal intensity for ^{238}U of the NIST SRM 610 glass with maintaining a

low oxide formation rate (ThO^+/Th^+ being $< 0.5\%$). A small amount of He gas (0.2–2.0 mL min^{-1}) was introduced into a collision/reaction cell to reduce the contribution of polyatomic ions with a kinetic energy discrimination (KED) process. The signal intensities of ^{29}Si , ^{31}P , ^{44}Ca , ^{202}Hg , $^{204}(\text{Hg} + \text{Pb})$, ^{206}Pb , ^{207}Pb , ^{232}Th , and ^{238}U were acquired by a mass scanning mode. At the signal intensity of 2×10^6 counts per second (cps), pulse counting detection on an electron multiplier was switched to an analog detection. The detailed analytical condition is summarized in Table 1.

Table 1. Instrumentation and Operational Setting of the LA-ICP-MS in this Study

<u>Laser ablation system</u>	
Instrument	: Jupiter solid nebulizer (ST Japan INC.)
Laser wavelength	: 260 nm
Sampling mode	: Raster mode
Fluence	: 3.5–4.0 J cm^{-2}
Spot size	: 20 μm
Repetition rate	: 20 Hz
Ablation pit size	: 20 $\times$ 20 μm square
He gasses flow rate	: 0.60 L/min
Ar make-up gas flow rate	: 0.85–0.91 L/min
<u>ICP mass spectrometer</u>	
Instrument	: iCAP TQ (Thermo Fisher Scientific)
Data reduction	: Integration of total ion counts per single ablation. Signals obtained from the first few seconds were not used for data reduction. Next, signals accumulated during the integration time (20 or 34 s) were integrated for further calculations, respectively. The intensity of ^{238}U is calculated assuming $^{238}\text{U}/^{235}\text{U} = 137.818^a$
Detection mode	: Scanning mode
Monitored isotopes (dwell time)	: ^{29}Si , ^{31}P , ^{44}Ca , ^{202}Hg , $^{204}\text{Hg} + ^{204}\text{Pb}$, ^{206}Pb , ^{207}Pb , ^{232}Th , and ^{238}U
The integration time per peak	: 16–22 s
Primary standard	: NIST SRM 612, Nancy 91500
Secondary standard	: OD-3, GJ-1
<u>Data processing</u>	
Normalization values	: $^{207}\text{Pb}/^{235}\text{U} = 1.8678$ and $^{206}\text{Pb}/^{238}\text{U} = 0.17928$ (Nancy 91500 ^{b,c}), $^{207}\text{Pb}/^{206}\text{Pb} = 0.9073$ (NIST SRM 612 ^d), Si mass fraction = 72.1 wt%, Th mass fraction = 37.79 $\mu\text{g g}^{-1}$, U mass fraction = 37.38 $\mu\text{g g}^{-1}$ ^{e,f}
<i>Note.</i> ^a Hiess et al. (2012). ^b Sakata et al. (2017). ^c Wiedenbeck et al. (1995). ^d Jochum & Brueckner (2008). ^e Jochum et al. (2011). ^f Pearce et al. (1997).	

The raw signal was monitored in the time-resolved analysis (TRA) mode to check the occurrence of any inclusions or cracks within the analytical spot. Data acquisition was based on integrating the total signals per single ablation. The integration time of 16 to 22 s was applied for all samples. The sample-standard bracketing technique was adopted to correct an elemental fractionation at a sample ablation and an instrumental mass bias on the analyses. The analytical session includes three spot analyses of Nancy 91500 zircon and NIST SRM 612 for calibration, fourteen spot analyses of unknown samples, and one spot analysis of OD-3 zircon. The ^{235}U signal intensity was calculated based on the ^{238}U signal intensity by normalizing the $^{238}\text{U}/^{235}\text{U}$ ratio to 137.818 (Hiess et al., 2012). In data reduction, we first implemented gas blank subtraction. The external correction was made for both $^{207}\text{Pb}/^{235}\text{U}$ and $^{206}\text{Pb}/^{238}\text{U}$ ratios of the unknown samples based on those of the Nancy 91500 zircon ($^{207}\text{Pb}/^{235}\text{U} = 1.8678$ and $^{206}\text{Pb}/^{238}\text{U} = 0.17928$; Sakata et al., 2017; Wiedenbeck et al., 1995). The $^{207}\text{Pb}/^{206}\text{Pb}$ ratios were also corrected by the NIST SRM 612 glass ($^{207}\text{Pb}/^{206}\text{Pb} = 0.9073$; Jochum & Brueckner, 2008). The Th and U abundances were calibrated using $^{232}\text{Th}/^{29}\text{Si}$ and $^{238}\text{U}/^{29}\text{Si}$ ratios of the NIST SRM 612 glass (Si mass fraction = 72.1 wt%, Th mass fraction = 37.79 $\mu\text{g g}^{-1}$, U mass fraction = 37.38 $\mu\text{g g}^{-1}$; Jochum et al., 2011; Pearce et al., 1997). The total uncertainties on isotopic data of the unknown samples sum the statistical error estimated from the signal intensity and the repeatability of standard measurements. To test the data quality, OD-3 and GJ-1 were used as secondary standards (see Appendix B and C) (Iwano et al., 2013).

This study applied Stacey-Kramers age correction using an IsoplotR software (Stacey & Kramers, 1975; Vermeesch, 2018) because the discordant gains were detected where the $^{207}\text{Pb}/^{235}\text{U}$ age was older than the $^{206}\text{Pb}/^{235}\text{U}$ age. In this correction, the cause of discordance was assumed to be the lead contamination at the crystal growth, judged based on the signal intensity of ^{204}Pb . The Stacey-Kramers correction also requires that the system be maintained as a closed system. Since Pb diffusion in zircon is very slow (Cherniak & Watson, 2001), this assumption generally satisfies zircon grains. This Stacey-Kramers correction is significant for determining the youngest grain age precisely and enables to minimize of the effect of loss of Pb (Cherniak & Watson, 2001), while the effect of primary lead is relatively tiny for zircons older than 300 Ma. Therefore, it does not affect the discussion on the existence of Paleozoic and Precambrian zircons described later. Our raw data of U-Pb LA-ICP-MS detrital zircon measurement and U-Pb LA-ICP-MS detrital zircon data files are provided in the supporting information (Data Set S1 and S2, respectively) (See chapter 2.7) and in Appendix B and C.

The concordia diagrams of the sandstone samples from the Urahoro and Nemuro Groups are provided in the supporting information (See chapter 2.7) and in Appendix B and C.

2.4 Results

2.4.1 Analysis of MDA and Th/U Ratio

The maximum depositional ages (MDA) were estimated from the ages of the youngest single grain (YSG) and the youngest graphical peak (YPP) based on the method from Dickinson & Gehrels (2009). The YSG is obtained from the youngest single grain for each sample, and the YPP is determined by identifying the first age peak from the age distribution of detrital zircon grains (Table 2).

The Th/U ratios were calculated to distinguish the zircon grains between the magmatic and metamorphic origins (Hoskin & Black, 2000; Rubatto, 2002). We divided the Th/U ratios of zircon grains between sandstones Type 1 (Figure 7a) and sandstones Type 2 (Figure 7b). In the zircon grains from sandstones Type 1, we identified 311 zircon grains, and 97.43% of grains have Th/U > 0.1, suggesting their magmatic origin. Most Precambrian zircons exhibited Th/U ratios of > 0.1 so that they are also of the magmatic origin (Figure 7a). The character of growth zoning within a zircon crystal predominates in the sandstones Type 1 (i.e., Kiritappu, Akkeshi, and Hamanaka Formations) and can be well observed in the CL images (Figure 8), indicative of magmatic origin (Corfu et al., 2003). In the case of sandstones Type 2 (Figure 7b), we analyzed 552 zircon grains, and 99.46% of grains have Th/U > 0.1 suggesting their magmatic origin (Figure 7b). The typical growth zoning is also well observed and predominates in the sandstones Type 2 (i.e., Shitakara, Yuubetsu, Tenneru, Harutori, Beppo, and Shiomi Formations) (Figure 8), it suggests a magmatic origin.

This study applied degree of the discordant filter is 10% due to yields of this study being a mix between Phanerozoic and Precambrian ages, and the relative proportion of those ages is important, so that way can still retain the Precambrian ages (Gehrels, 2012). This study also only filtered 10% discordant cutoff for old ages (>1.0 Ga) due to application of a discordance filter for young ages is generally not possible because of the large uncertainty of $^{206}\text{Pb}/^{207}\text{Pb}$ ages, and filtering based on discordance would bias the resulting age distribution toward young ages (Gehrels, 2012). The ages of young zircon grains (<1.0 Ga) use $^{206}\text{Pb}/^{238}\text{U}$ ages, whereas the ages of old zircon grains (>1.0 Ga) use $^{207}\text{Pb}/^{206}\text{Pb}$ ages (Dickinson &

Gehrels, 2008, 2009; Gehrels, 2012; Gehrels et al., 2008). Zircon U-Pb ages with high discordance (>10%) were excluded from the calculations (See Appendix B for the results of the calculation). The formula of discordant in percentage is below:

When the age^{206Pb/238U} of zircon <1.0 Ga:

$$\text{Discordance} = \{1 - (^{206}\text{Pb}/^{238}\text{U Age}/(^{207}\text{Pb}/^{235}\text{U Age}))\} \times 100\%$$

When the age^{206Pb/238U} of zircon >1.0 Ga:

$$\text{Discordance} = \{1 - (^{206}\text{Pb}/^{238}\text{U Age})/(^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$$

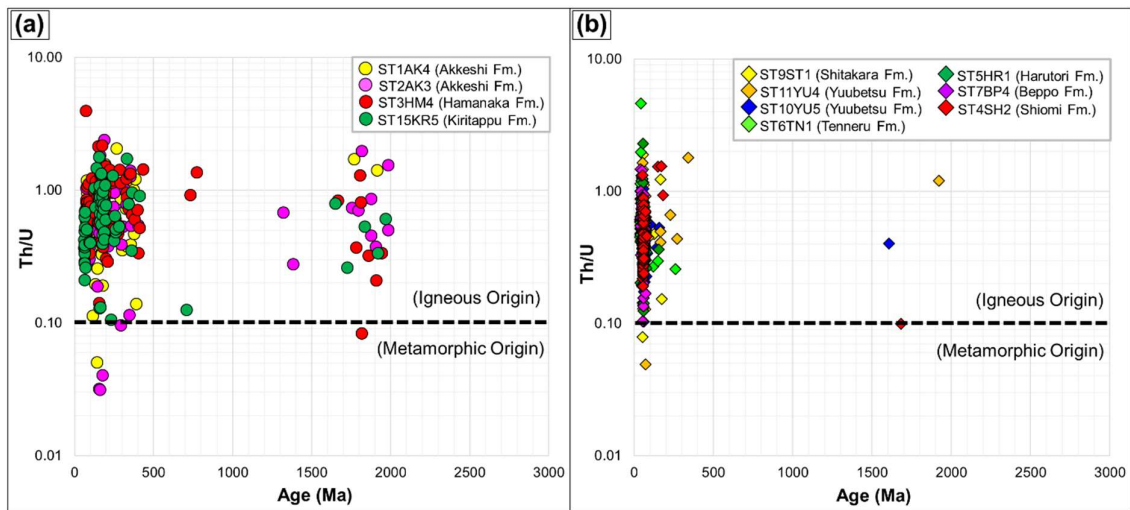


Figure 7. The Th/U ratio of zircon grains from (a) sandstones Type 1 and (b) sandstones Type 2. The zircon grains with Th/U >0.1 usually indicate a magmatic origin, and Th/U <0.1 indicates a metamorphic origin (e.g., Hoskin & Black, 2000; Rubatto, 2002). Abbreviation: Fm = Formation.



Figure 8. Cathodoluminescence (CL) and backscattered electron (BSE) images of selected detrital zircon for the Urahoro Group (left) and Nemuro Group (right). Red circles indicate the locations of the U-Pb spots. White scale bars are 50 μ m long.

2.4.2 U-Pb Age Distribution of Detrital Zircons in the Nemuro Belt Complex

In total, eleven sandstone samples from the Nemuro and Urahoro Groups in the Nemuro Tectonic Belt complex were analyzed for the U-Pb age distribution of detrital zircon grains (Figure 9). We analyzed five sandstone samples from four formations of the Nemuro Group: The Hamanaka Formation (ST3HM4), the Akkeshi Formation (ST1AK4 and ST2AK3), the Kiritappu Formation (ST15KR5), and the Shiomi Formation (ST4SH2). In the Hamanaka Formation (ST3HM4), 92 zircon grains were analyzed, and the age spectrum ranged broadly. Detrital zircon grains in this sample range from Proterozoic to Cenozoic and are classified into

six groups (Figure 10): Proterozoic (10.87%), Paleozoic (19.57%), Triassic (10.87%), Jurassic (23.91%), Cretaceous (33.70%), and Cenozoic (1.09%). The most prominent age peak was 78 Ma, and subordinate peaks were 1.81 Ga, 345 Ma, and 175 Ma (Figure 9). The YSG age for the Hamanaka Formation is 65.8 ± 3.6 Ma (Table 2), corresponding to the Danian (Paleocene). Two samples were taken from the Akkeshi Formation (ST1AK4 and ST2AK3), containing 68 and 86 zircon grains. Both specimens exhibited broad age distributions similar to those in the Hamanaka Formation. Detrital zircon grains in ST1AK4 range from Proterozoic to Late Cretaceous and are classified into five groups (Figure 10): Proterozoic (2.94%), Paleozoic (19.12%), Triassic (7.35%), Jurassic (38.24%), and Cretaceous (32.35%). This specimen's most prominent age peak was at 158 Ma, and subordinate peaks were at 1.9 Ga, 1.8 Ga, 350 Ma, and 85 Ma (Figure 9). The YSG age in ST1AK4 is 69.6 ± 2.0 Ma (Table 2), corresponding to the Maastrichtian (Late Cretaceous). Detrital zircon grains in the sample ST2AK3 are also classified into five groups (Figure 10): Proterozoic (11.63%), Paleozoic (15.12%), Triassic (6.98%), Jurassic (33.72%), and Cretaceous (32.56%). This sample's most prominent age peak was at 168 Ma, and subordinate peaks were at 1.87 Ga, 1.35 Ga, 340 Ma, 250 Ma, and 82 Ma (Figure 9). The YSG age in ST2AK3 is 71.5 ± 1.6 Ma (Table 2), corresponding to the Maastrichtian (Late Cretaceous). In the Kiritappu Formation (ST15KR5), a total of 65 zircon grains were analyzed, and the age spectrum ranged broadly. Detrital zircon grains in this sample range from Proterozoic to Cenozoic and are classified into six groups (Figure 10): Proterozoic (10.77%), Paleozoic (13.85%), Triassic (4.62%), Jurassic (40.0%), Cretaceous (10.77%), and Cenozoic (20.0%). The most prominent age peak was 169 Ma, and subordinate peaks were 1.92 Ga, 1.68 Ga, 350 Ma, 255 Ma, and 64 Ma (Figure 9). The YSG age for the Kiritappu Formation is 59.0 ± 1.5 Ma (Table 2), corresponding to the Thanetian (Paleocene). A sample from the Shiomi Formation (ST4SH2) contained 76 zircon grains, exhibiting a single age peak at 57 Ma (Figure 9). Detrital zircon grains in this sample range from Proterozoic to Eocene and are classified into four groups (Figure 10): Proterozoic (1.32%), Jurassic (3.95%), Cretaceous (2.63%), and Cenozoic (92.11%). The YSG age for the Shiomi Formation is 52.1 ± 0.8 Ma (Table 2), corresponding to the Ypresian (Early Eocene).

Regarding the Urahoro Group, we collected six sandstone samples (Table 2; Figure 9) from five formations: the Beppo Formation (ST7BP4), the Harutori Formation (ST5HR1), the Tenneru Formation (ST6TN1), the Yuubetsu Formation (ST11YU4 and ST10YU5), and the Shitakara Formation (ST9ST1). In the Beppo Formation (ST7BP4), a total of 73 zircon grains were analyzed and contained a single peak at 58 Ma (Figure 9). Detrital zircon grains in this

sample range from Late Cretaceous to Eocene and are classified into two groups (Figure 10): Cretaceous (10.96%) and Cenozoic (89.04%). The YSG age for the Beppo Formation is 39.8 ± 1.2 Ma (Table 2), corresponding to the Bartonian (Middle Eocene). In the Harutori Formation (ST5HR1), the U-Pb age data for 76 zircon grains yielded a single peak at 56 Ma (Figure 9). Detrital zircon grains in this sample range from Late Jurassic to Eocene and are classified into three groups (Figure 10): Jurassic (1.32%), Cretaceous (3.95%), and Cenozoic (94.74%). The YSG age for the Harutori Formation is 38.7 ± 1.2 Ma (Table 2), corresponding to the Bartonian (Middle Eocene). In the Tenneru Formation (ST6TN1), a total of 86 zircon grains were analyzed and contained a single peak population at 52 Ma (Figure 9). Detrital zircon grains in this sample range from Paleozoic to Eocene and are divided into four groups (Figure 10): Paleozoic (1.16%), Jurassic (1.16%), Cretaceous (11.63%), and Cenozoic (86.05%). The YSG age for the Tenneru Formation is 37.2 ± 1.1 Ma (Table 2), corresponding to the Priabonian (Late Eocene). In the Yuubetsu Formation, two sandstone samples (ST11YU4 and ST10YU5) were analyzed, which contained 74 and 82 zircon grains, respectively. The sandstone samples from Yuubetsu Formation yielded similar peaks at 60 Ma (Figure 9). Detrital zircon grains in the samples of ST11YU4 and ST10YU5 have a range from Proterozoic to Eocene, and for ST11YU4 sample is classified into six groups (Figure 10): Proterozoic (1.35%), Paleozoic (2.70%), Triassic (1.35%), Jurassic (2.70%), Cretaceous (24.32%), and Cenozoic (67.57%), whereas for ST10YU5 sample is classified into four groups (Figure 10): Proterozoic (1.22%), Jurassic (1.22%), Cretaceous (20.73%), and Cenozoic (76.83%). The YSG age for the ST11YU4 and ST10YU5 is 45.1 ± 1.6 Ma and 42.1 ± 2.1 Ma (Table 2), corresponding to the Lutetian (Middle Eocene). In the Shitakara Formation (ST9ST1), 85 zircon grains were analyzed and contained a single peak at 55 Ma (Figure 9). Detrital zircon grains in this sample range from Jurassic to Eocene and are classified into three groups (Figure 10): Jurassic (2.35%), Cretaceous (12.94%), and Cenozoic (84.71%). The YSG age for the Shitakara Formation is 42.9 ± 1.3 Ma (Table 2), corresponding to the Lutetian (Middle Eocene).

Table 2. Summary of detrital zircon U-Pb analysis comparing with depositional ages from biostratigraphy/radiometric dating and MDA for sandstone samples in the Urahoro and Nemuro Groups.

No.	Formation (Sample Code)	Location	Sample Type	No. of U-Pb Analyses	Stratigraphy Age (Biostratigraphy/Radiometric Dating)	Age Spectra (Ma)	MDA		
							YSG (Ma ± 2σ)	YPP (Ma)	
<u>Urahoro Group (Nemuro Belt)</u>									
1.	Shitakara (ST9ST1)	Akkeshi Bay	Sst	85 (104)	Paleogene	late/middle Eocene	55	42.9 ± 1.3	49
2.	Yuubetsu (ST10YU5)	Akkeshi Bay	Sst	82 (104)		middle Oligocene	60	42.1 ± 2.1	48
3.	Yuubetsu (ST11YU4)	Shiranuka-hill	Sst	74 (104)		middle Oligocene	60	45.1 ± 1.6	47
4.	Tenneru (ST6TN1)	Akkeshi Bay	Sst	86 (104)		39.1 ± 0.2 Ma	52	37.2 ± 1.1	39
5.	Harutori (ST5HR1)	Akkeshi Bay	Sst	76 (104)		39.5 ± 0.2 & 40.8 ± 1.1 Ma	56	38.7 ± 1.2	55
6.	Beppo (ST7BP4)	Akkeshi Bay	Sst	73 (104)		N/A (no fossil record)	58	39.8 ± 1.2	40
<u>Nemuro Group (Nemuro Belt)</u>									
7.	Shiomi (ST4SH2)	Akkeshi Bay	Sst	76 (104)	Late Cretaceous – Paleogene	Selandian	57	52.1 ± 0.8	54
8.	Kiritappu (ST15KR5)	Hamanaka Bay	Sst	65 (65)		Danian	64, 169 , 255, 350, 1680, 1920	59.0 ± 1.5	62
9.	Akkeshi (ST1AK4)	Hamanaka	Sst	68 (104)		Danian	85, 158 , 350, 1800, 1900	69.6 ± 2.0	70
10.	Akkeshi (ST2AK3)	Hamanaka	Sst	86 (104)		Danian	82, 168 , 250, 340, 1350, 1870	71.5 ± 1.6	72
11.	Hamanaka (ST3HM4)	Hamanaka	Sst	92 (117)		Lower Maastrichtian	78 , 175, 345, 1810	65.8 ± 3.6	71
12.	Nokkamappu (ST13NKP1,3,4)	Nemuro	Sst	N/A ^{*)}		middle – upper Campanian	N/A ^{*)}		

Note: ^{*)}Observation in the ST13NKP1, ST13NKP3, and ST13NKP4 samples showed no zircons were found.

The bold numbers at age spectra show the most prominent age peak.

See Appendix B for YSG results from samples in the Nemuro Belt

Abbreviations: MDA–Maximum Depositional Age; Sst–Sandstone; YPP–The Youngest Graphical Age Peak; YSG–The Youngest Single Grain Age.

2.4.3 Classification of U-Pb Age Distribution

The resulting zircon U-Pb age distributions in the Nemuro Belt complex show two types of characteristics for age distributions based on proportions of the detrital zircons from sandstone samples of the Nemuro and Urahoro Groups. Type 1 is characterized by a broad age distribution observed from the Hamanaka to Kiritappu Formations (Nemuro Group). Meanwhile, Type 2 is characterized by a single peak population observed from the Shiomi Formation (Nemuro Group) and all formations of the Urahoro Group (Figure 9).

The Type 1 signatures were identified in the four sandstone samples from the Nemuro Group (i.e., ST3HM4, ST1AK4, ST2AK3, and ST15KR5), characterized by a broad age range (i.e., multimodal ages distributions) from Precambrian to Cenozoic. In this type, the Mesozoic ages are dominant, ranging from Jurassic (175–158 Ma) to Late Cretaceous (78–85 Ma) (Figure 9). The population of Precambrian zircon ages is distinctive in this Type 1, which exhibits scattered age distribution at the Proterozoic (e.g., ~1.9–1.8 Ga, ~1.6 Ga, and ~1.3 Ga) (Figure 9). Cenozoic zircon ages were also detected in this Type 1 (sample from Kiritappu Formation), showing a peak at 64 Ma (Figure 9).

The Type 2 signatures were identified in the seven sandstone samples from the Nemuro Group (i.e., ST4SH2) and all formations of the Urahoro Group (ST7BP4, ST5HR1, ST6TN1, ST10YU5, ST11YU4, and ST9ST1). This Type 2 is characterized by the unimodal distribution of Cenozoic age populations (Figure 9), whose peak ranges from 60–52 Ma (Figure 9). Another distinct character in Type 2 is the limited number of Precambrian zircons. This characteristic is opposite to sandstones Type 1. The distributions of Precambrian zircons can be observed only in the three sandstone samples taken from the Shiomi Formation of the Nemuro Group and the Yubetsu Formation of the Urahoro Group (ST4SH2, ST10YU5, and ST11YU4) (Figure 10). The Precambrian zircons occupy only about 1% of the distributions in these samples (Figure 10).

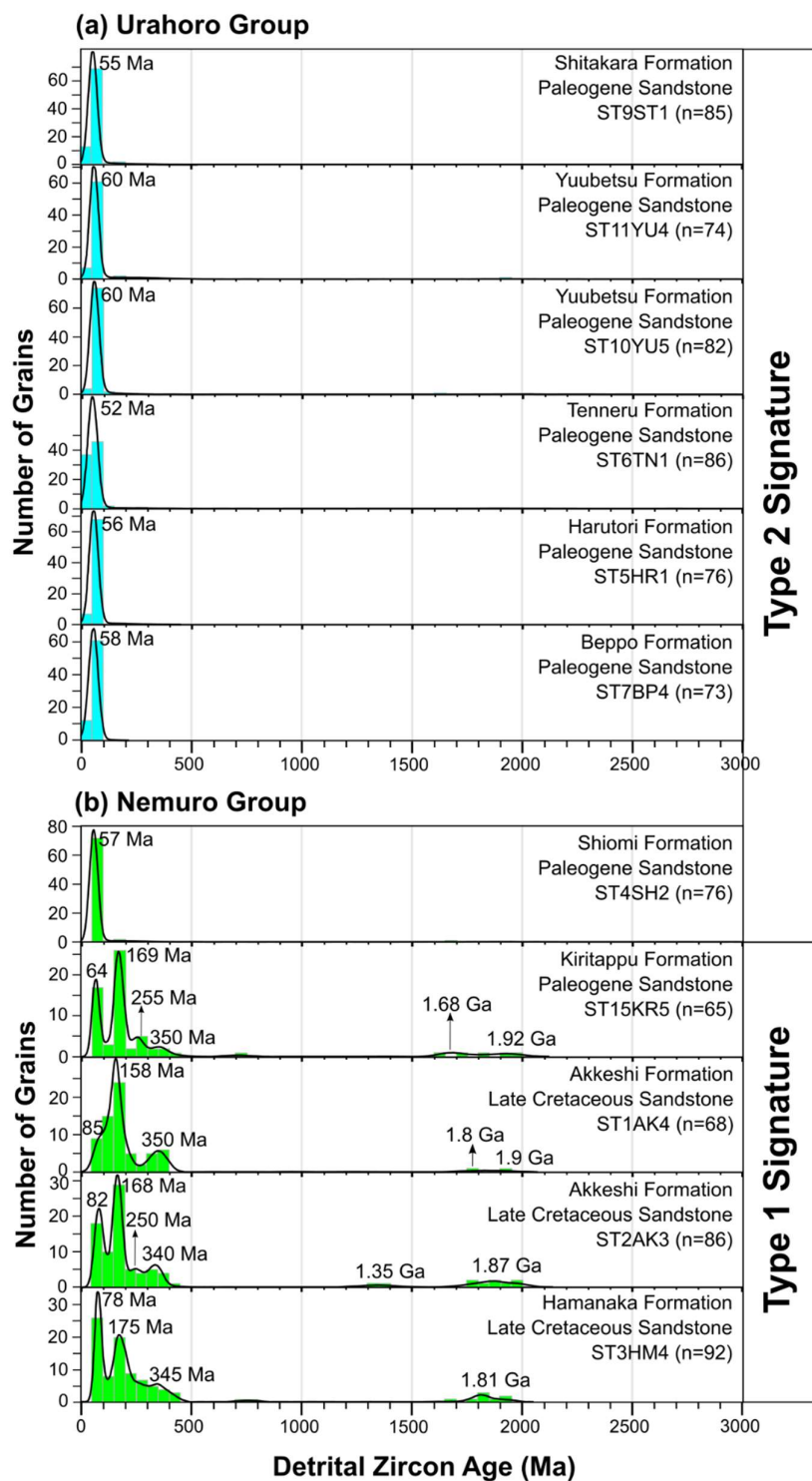


Figure 9. Detrital zircon U-Pb age distributions for sandstone samples in the (a) Urahoro Group and (b) Nemuro Group. Blackline: KDE has 20 Myr bandwidth, and histograms have 50 Myr bandwidth. Data of U-Pb LA-ICP-MS detrital zircon of the Urahoro and Nemuro Groups is provided in the supporting information (Data Set S2). Abbreviation: n = number of zircon grain analyses.

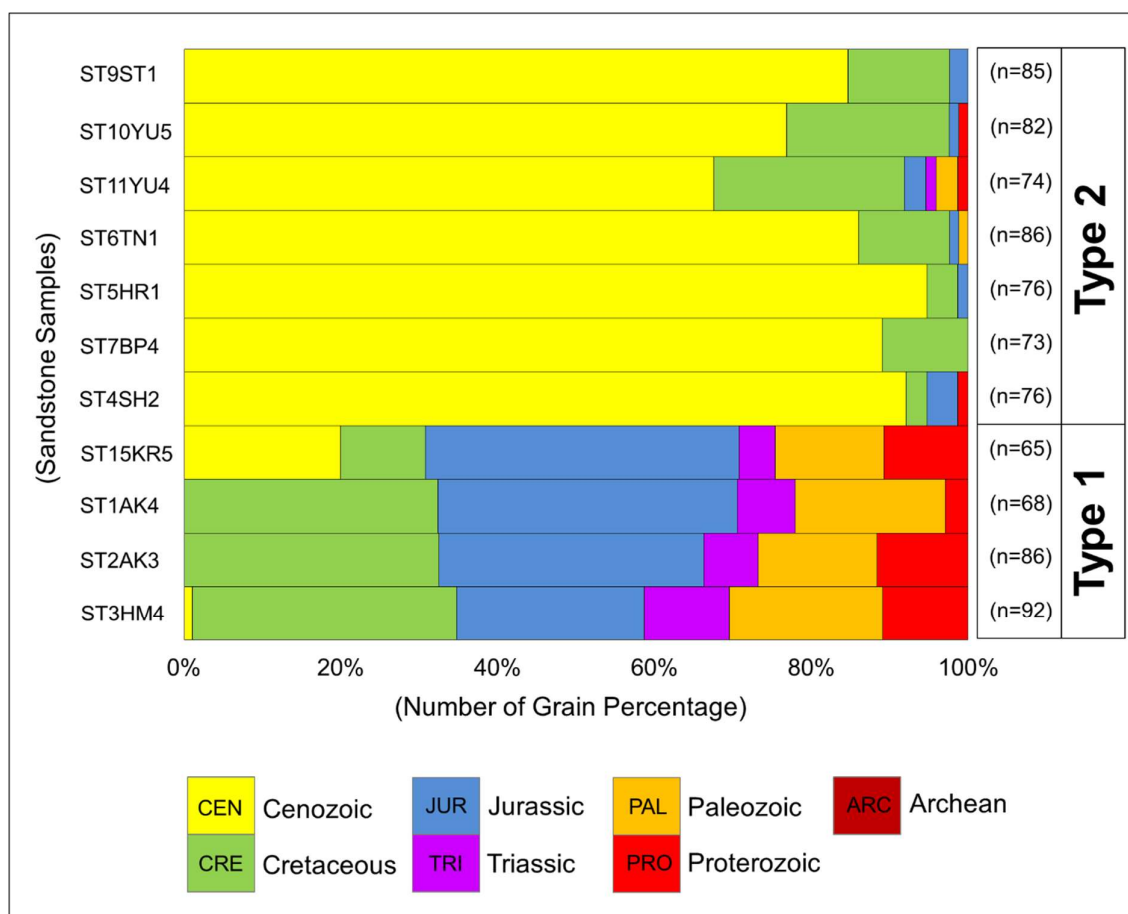


Figure 10. Stacked bar graphs showing the percentage of detrital zircon age distributions for sandstones Type 1 and Type 2 in the Nemuro Belt complex through time. Abbreviation: n = number of zircon grain analyses.

2.5 Discussion

2.5.1 Depositional Ages and Hiatus of the Nemuro and Urahoro Groups

This study examined the maximum depositional ages of the Nemuro and Urahoro Groups from U-Pb ages of detrital zircons to constrain the depositional ages of the Nemuro Belt complex. The age of the Nemuro Group has been considered to range from the Late Cretaceous to the Paleogene based on the paleontological evidence (Figure 11). The molluscan fossils in the Hamanaka and Akkeshi Formations indicated the Early Maastrichtian (Late Cretaceous) (Naruse et al., 2000) (Figure 11). This study's YSG ages from these formations range from ca. 71 to 69 Ma (Figure 11; Table 2), corresponding to the Late Cretaceous. This range of the YSG ages is consistent with the biostratigraphic results.

Regarding the uppermost formations in the Nemuro Group, the nannofossils study in the Kiritappu and the middle part of the Shiomi Formations confirms that the depositional ages of formations are the Danian (66.0 to 61.6 Ma) and Selandian (61.6 to 59.2 Ma) (Figure 11) of the Paleocene (Okada et al., 1987). In this study, the YSG ages of the detrital zircon from the uppermost horizon of the Shiomi Formation is ca. 52 Ma (Figure 11; Table 2), corresponding to the Ypresian (Early Eocene). Thus, this study identified the age gap between the middle and the uppermost Shiomi Formation (Figures 5 and 11). This gap may occur due to the upper stratigraphic horizon of our sampling point. Still, it could also be that there is an unexposed unconformity in the Shiomi Formation that caused the hiatus.

In the Urahoro Group, the radiometric ages of tuff beds and the biostratigraphic analysis imply that its depositional age is the middle Eocene (Figure 11). Kaiho (1983) and Sasa (1940a, 1940b) correlated the Urahoro Group to the lower to the middle part of the Poronai Formation of the Ishikari Group based on benthic foraminifers and molluscan fossils, corresponding to the late Eocene (36.7 Ma). A recent study of U-Pb zircon dating from tuff layers in the Tenneru and Harutori Formations revealed that the depositional age of the Urahoro Group was the middle Eocene (ca. 40 Ma) (Figure 5 and 11) (Katagiri et al., 2016, 2019). Our result of the YSG ages of the detrital zircon grains from six Urahoro Group formations shows that the depositional age of the group is the Eocene, ranging from ca. 45 to 37 Ma (Figure 11; Table 2), therefore supporting previous estimates.

In summary, our findings from U-Pb dating of zircons from sedimentary rocks revealed that the youngest single grain ages of the detrital zircons are consistent with the depositional ages reported in the previous studies, ranging from ca. 71 to 37 Ma (Late Cretaceous – Late Eocene) (Figure 11; Table 2). The Nemuro Group deposited from the Late Cretaceous (ca. 71 Ma) to the Early Eocene (ca. 52 Ma) with a possible unexposed unconformity. The hiatus can range from 59 to 52 Ma (Figures 5 and 11). The depositional age of the Urahoro Group was reported as around 40 Ma (Figures 5 and 11), and the youngest ages of detrital zircons were consistent with this value. Judging from the age difference between the uppermost part of the Shiomi Formation (Nemuro Group) and the Beppo Formation (Urahoro Group), the hiatus between these two groups is shorter than 12 Ma (Figures 5 and 11).

As mentioned above, following the conventional method for analyzing detrital zircons, the discordant filter was not applied to the younger (<1 Ga) zircons in this study. However, this does not necessarily mean that the results for younger zircon particles were accurate. In the case of samples obtained from the Akkeshi and Hamanaka Formations, many particles show a

significant difference between $^{206}\text{Pb}/^{238}\text{U}$ and $^{207}\text{Pb}/^{235}\text{U}$ ages. Considering this, the possibility of Pb loss in zircon due to diagenesis cannot be completely ruled out. Therefore, the accuracy of the YSG and YPP ages of these formations should be carefully evaluated in future studies.

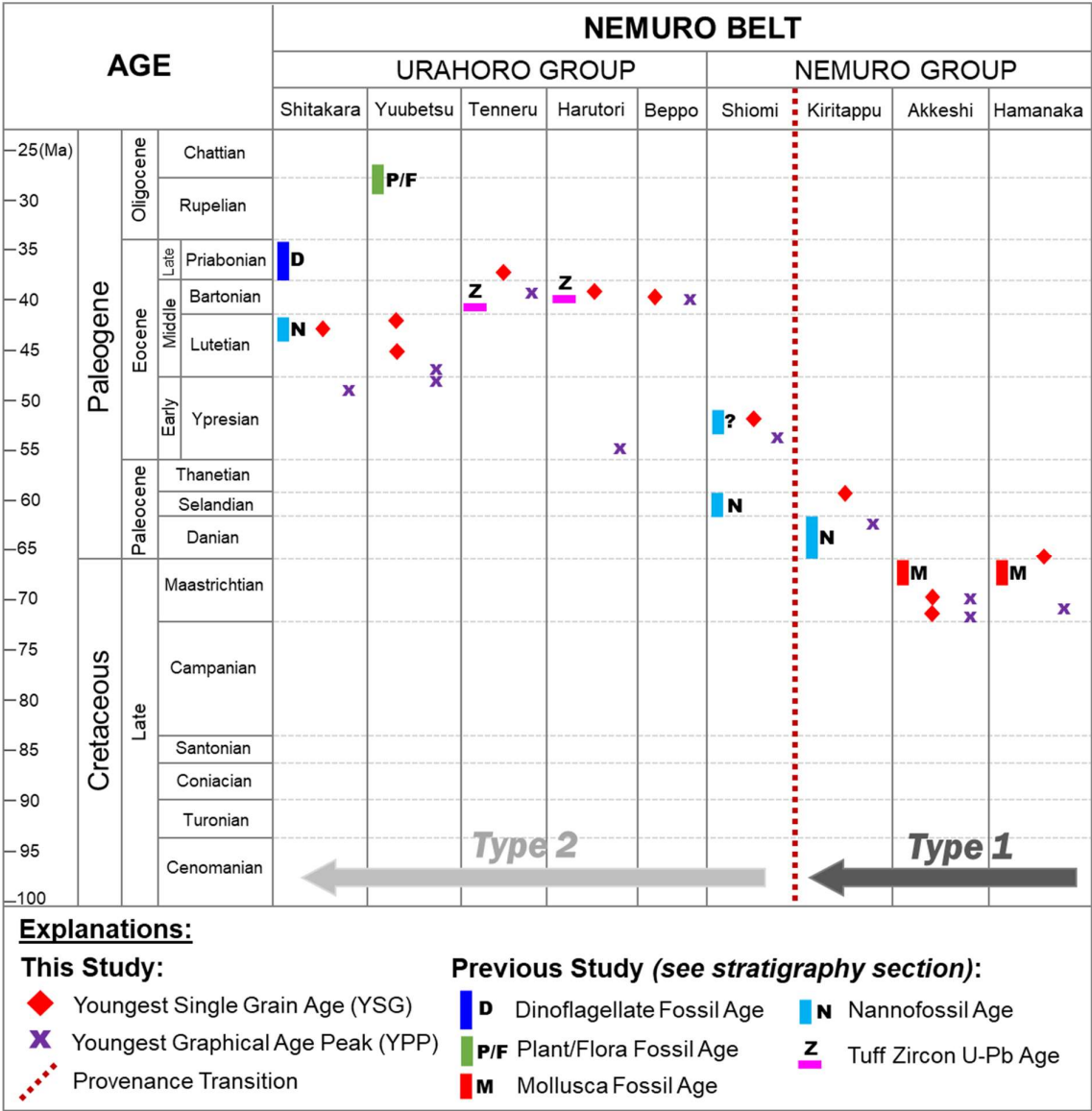


Figure 11. Relationship of YSG and YPP to depositional age (fossil assemblages and radiometric dating from previous studies). Provenance transition (red dotted line) was identified in the Nemuro Belt between sandstones Type 1 (dark gray arrow) and Type 2 (light gray arrow).

2.5.2 Provenance Transition in the Nemuro Belt

The result of detrital zircon U-Pb age distributions showed that there was a provenance transition that occurred in the Nemuro Belt between the deposition of the Kiritappu and Shiomi Formations (Figure 9). This provenance transition can be well recognized from different distributions. The age distribution of sandstones collected from the Kiritappu Formation is characterized by multimodal age distribution and to be unimodal distribution in the deposition of the Shiomi Formation (Figure 9). This distinct evidence reveals that a provenance transition occurred in the Nemuro Belt during the deposition of the Nemuro Group between the Kiritappu and Shiomi Formations, and the period can be estimated in the Paleogene between 62 Ma (YPP age of the Kiritappu Formation) and 54 Ma (YPP age of the Shiomi Formation) (Figure 9; Table 2).

2.6 Conclusions

Based on U-Pb dating of detrital zircon grains from the Nemuro and Urahoro Groups in the Nemuro Belt complex, the conclusions are as follows:

1. There are two detrital zircon U-Pb type signatures developed in the sandstones of the Nemuro Belt complex. Type 1 signature is characterized by widespread peaks from Precambrian to Cenozoic ages. It can be found in the Late Cretaceous to Paleocene sandstone samples of the Nemuro Group (e.g., Hamanaka, Akkeshi, and Kiritappu Formations). A single peak characterizes the Type 2 signature, dominated mainly by the Cenozoic ages. This type is found in the Paleogene sandstone samples from the Nemuro Group (Shiomi Formation) to the Urahoro Group (Beppo, Harutori, Tenneru, Yuubetsu, and Shitakara Formations).
2. These two signatures indicate a provenance transition in the Paleo-Kuril Arc from multiple sources (Type 1) to a single source (Type 2). This transition occurred in the Paleogene between the deposition of the Kiritappu and Shiomi Formations (between 62 to 54 Ma).

2.7 Data Availability (Supporting Information)

Data for this study are available at **Appendix B**, containing the U-Pb LA-ICP-MS detrital zircon data and concordia age plot.

3. Detrital Zircon U-Pb Ages from Late Cretaceous to Paleogene Sandstones of the Saroma and Yubetsu Groups in the Tokoro Belt, Eastern Hokkaido, Northern Japan

3.1 Introduction

The spatial and temporal variation in provenance source recorded in clastic sedimentary rocks can contribute reconstruction of the tectonic history of the region (Cawood et al., 2012; Fedo et al., 2003). For this purpose, the detrital zircon age distribution in sandstones is a well-established approach (e.g., Dickinson et al., 2012; Fedo et al., 2003; Gehrels & Dickinson, 1995). This technique can assign specific igneous or metamorphic crystallization ages to provenance components that contain zircon as a significant phase and therefore help analyze the geological terranes that formed the provenance (McLennan et al., 2001).

Investigation of detrital zircon grains that occur in almost all sedimentary deposits can play an essential role in interpreting the history of modern and ancient deposits because its ability is highly refractory to the development history of Earth's surface. Therefore, it provides a critical link in understanding the source history of a deposit (Fedo et al., 2003).

The Tokoro Belt has been regarded as a tectonic belt and formed along the Paleo-Kuril Arc (PKA) system (Figure 12) (e.g., Nanayama et al., 1993). This belt is exposed in the western part of the PKA system (Figure 12) and is notably different from the Nemuro Belt in the eastern part of the PKA system. The Tokoro Belt represents the Late Cretaceous accretionary complex with forearc basin deposits. The basaltic and volcanoclastic rocks also occur in this tectonic belt (Sakai et al., 2019). Several models for the tectonic evolution of the Tokoro Belt have suggested that this belt originated from the NW Pacific region during the Late Cretaceous period and developed as an intra-oceanic arc system (e.g., Bazhenov et al., 2001; Domeier et al., 2017). Numerous biostratigraphic studies were also conducted in this belt, suggesting that the Tokoro Belt ranges in age from the Late Jurassic (Nikoro Group) to Paleogene (Yubetsu Group) (e.g., Iwata et al., 1983; Iwata & Tajika, 1986; Kiminami et al., 1990; Kurita & Tajika, 1998b; H. Okada et al., 1989). Various studies have been conducted in the Tokoro Belt to understand the stratigraphy age (e.g., Iwata & Tajika, 1986; H. Okada et al., 1989), tectonic evolution (e.g., Bazhenov et al., 2001; Domeier et al., 2017; Nanayama et al., 2021), up to the distribution of volcanic and volcanoclastic rock units and geochemistry of basaltic rocks (e.g., Sakai et al., 2019; Yamasaki & Nanayama, 2017).

However, the origin of the Tokoro Belt is still poorly constrained (Bazhenov & Burtman, 1994; Nanayama et al., 1993). The Tokoro Belt has been considered a part of the Paleo-Kuril Arc (e.g., Nanayama et al., 1993), but it has not been clarified that the arc developed in the Pacific or continent. In addition, the Yubetsu Group of the Tokoro Belt is often assigned to the Hidaka Belt, which is a part of the Northeast Japan (Tohoku) Arc. Thus, a geochronology study is necessary to be conducted in the Tokoro Belt to obtain additional geological information, which is helpful for understanding the origin of the Tokoro Belt of the Paleo-Kuril Arc.

This study provides the first report of the U-Pb zircon geochronological data of the Late Cretaceous to Paleogene sandstones in the Tokoro Belt of the Paleo-Kuril Arc. In total, five sandstone samples were collected from the Saroma and Yubetsu Groups in the Tokoro Belt. This study conducted U-Pb dating of detrital zircon grains by employing laser ablation–inductively coupled plasma–mass spectrometry (LA-ICP-MS).

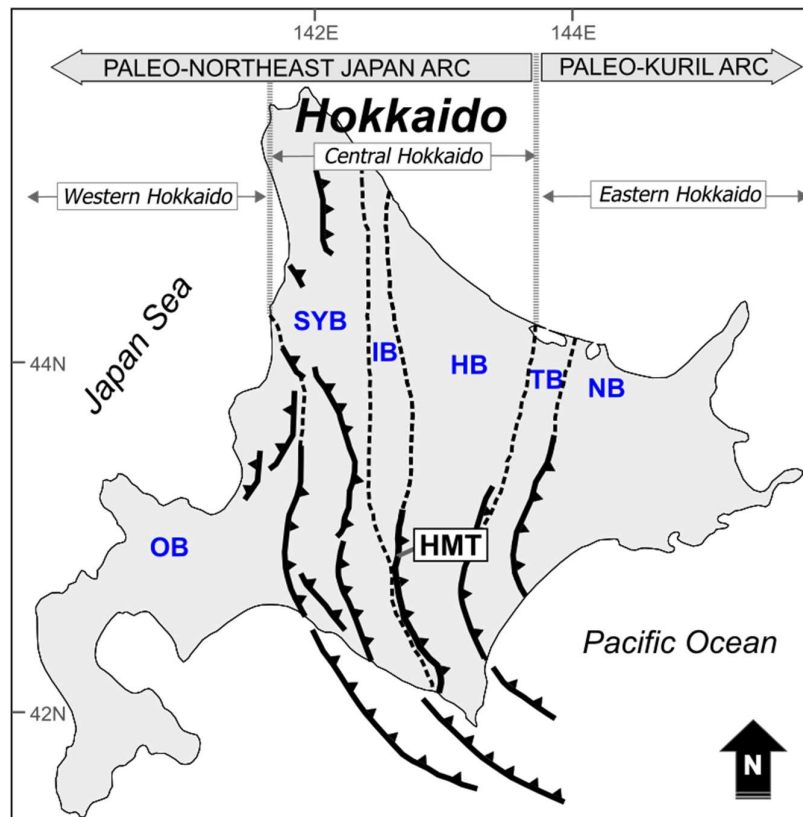


Figure 12. Tectonic framework of Hokkaido, showing the division Hokkaido between PKA and Paleo-NE Japan Arc systems (modified after Iwasaki et al., 2004). Abbreviations: HB–Hidaka Belt; HMT–Hidaka Main Thrust; IB–Idonnappu Belt; NB–Nemuro Belt; OB–Oshima Belt; SYB–Sorachi-Yezo Belt; TB–Tokoro Belt.

3.2 Geological Setting

The Tokoro Belt is located in the eastern Hokkaido (Figure 13) and was considered a subduction complex that elongated from north to south exceeding 150 km long and up to 40 km wide (Yamasaki & Nanayama, 2017). It is composed of three groups: The Nikoro, Saroma, and Yubetsu Groups (e.g., Iwata & Tajika, 1986). The Nikoro Group is the complex of the Late Jurassic to Late Cretaceous sedimentary and volcanic successions that consist of greenstone, limestone, chert, and terrigenous rocks (Bamba, 1984; H. Okada et al., 1989). The Saroma Group is the Late Cretaceous (Coniacian and Santonian) deposits composed of sandstones and mudstones. The Yubetsu Group is also composed of sandstones and mudstones. Previous studies implied that the Yubetsu Group range in age from the Campanian to Paleogene (Iwata and Tajika, 1986; Kiminami et al., 1990) on the basis of the biostratigraphy and the radiometric dating of the tuff bed. Some researchers consider that the Yubetsu Group belongs to the Hidaka Belt (e.g., Kiminami & Kontani, 1979; Nanayama et al., 1993, 2019, 2021) or the Yubetsu Belt (e.g., Iwata & Tajika, 1986; Sakai et al., 2019) (see the following section). Bazhenov et al. (2001) considered that this belt continues to Anniva Penninsula of South Sakhalin, while some researchers (e.g., Kiminami & Kontani, 1979; Nanayama et al., 1993, 2019, 2021) interpreted that the strata exposed in that region are correlated to the Hidaka Belt. Based on Kiminami & Kontani (1983), The provenance source of the Tokoro Belt was interpreted to be an active magmatic arc located in the east of the basin. This study investigated two groups in this belt: the Saroma and Yubetsu Groups.

3.2.1 Nikoro Group

The Nikoro Group (Figure 13a) consists of greenstones associated with basaltic and trachytic pillow lavas, dykes of dolerite and trachyte, hyaloclastites, and ultramafic cumulates. The group also contains pelagic to hemipelagic deposits, including mudstones, chert, limestone, and manganiferous hematite ore (Sakakibara et al., 1986). The thickness of this group is approximately 4 km (Okada et al., 1989). This group has been interpreted as deposits on oceanic plates and volcanoclastics in seamounts (Sakakibara, 1986; Sakakibara et al., 1986). It is unconformably overlain by the Saroma Group (Sakakibara et al., 1986). The microfossil assemblages that occurred in the pelagic deposits of the Nikoro Group implied the age from the Late Jurassic to the Early Cretaceous (Kimmeridgian – early Albian) (Okada et al., 1989).

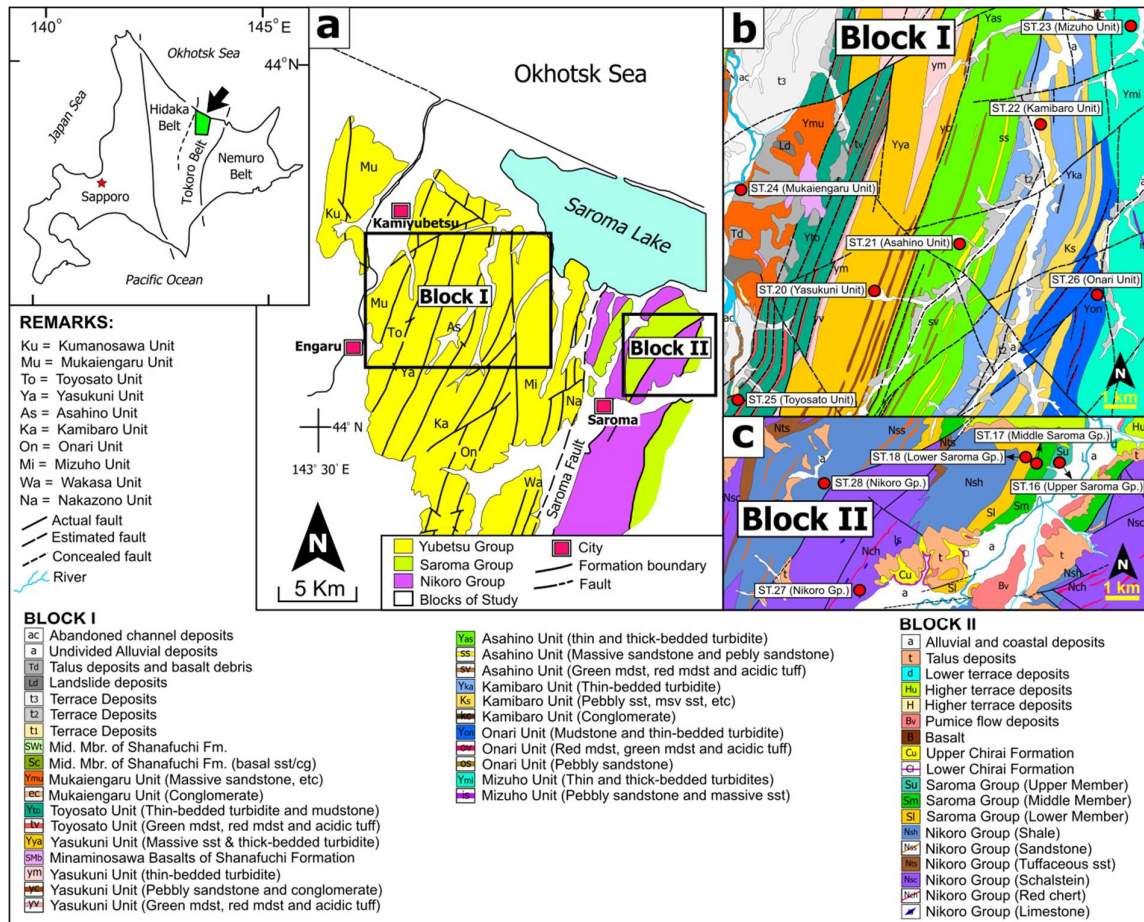


Figure 13. Geologic map of the Tokoro Belt and sample localities. (a) Geological map of the NW margin of the Tokoro Belt (modified after Kurita & Tajika, 1998a). The map shows the distribution of three groups: Nikoro (purple color), Saroma (light green color), and Yubetsu (yellow color) Groups. Black squares are showing the blocks of the study area. (b) Study area of the Block I (Yubetsu Group) with sampling locations (red filled rounds). (c) Study area of the Block II (Nikoro and Saroma Groups) with sampling locations (red filled rounds). Block I and II are modified from GeomapNavi, 2022 <https://gbank.gsj.jp/geonavi/datastore/>.

3.2.2 Saroma Group

This group (Figure 13a) consists of sedimentary sequences of conglomerate, sandstone, and mudstone in ascending stratigraphic order and unconformably overlies the Nikoro Group (Bamba, 1984; H. Okada et al., 1989). The Saroma Group has been considered to represent forearc basin deposits (Kiminami et al., 1985). The thickness of this formation exceeds 500 m (Bamba, 1984). The age of this formation was reported to be the Late Cretaceous (Coniacian–Santonian) (Figure 14) based on the analysis of radiolarian biostratigraphy (Iwata et al., 1983).

In addition, Sakakibara & Tanaka (1986) discovered *Sphenocerasmus schmidtii* in the Saroma Group and indicated the age to be the Late Cretaceous (Campanian) (Figure 14).

The Saroma Group is subdivided into three units (the Lower, Middle, and Upper) based on their lithology (Figure 13c). The Lower (*Sl*) of the Saroma Group consists of sandstone interbedded with conglomerate, and the Middle (*Sm*) consists of alternations of shale and sandstone. The Upper (*Su*) of the Saroma Group consists of shale.

3.2.3 Yubetsu Group

The Yubetsu Group (Figure 13a) has been considered an accretionary prism deposit, consisting mainly of hemipelagic shales and turbidite sandstones. The reverse fault separates the Yubetsu Group from the Nikoro and Saroma Groups (Figure 13a and 14) (Sakakibara et al., 1986; Jun Tajika, 1988). This group is subdivided into ten units: The Kumanosawa, Mukaiengaru, Toyosato, Yasukuni, Asahino, Kamibaro, Onari, Mizuho, Wakasa, and Nakazono Units in ascending stratigraphic order (Figure 13a). A previous study interpreted that these units are formations, but Tajika (1988) suggested that the boundary between these lithologic units are faults. Thus, their stratigraphic relations are unknown. This study follows Tajika (1988)'s interpretation so that they are named here as the Units. The age of the Yubetsu Group is indicated to be the Late Cretaceous to Paleogene on the basis of radiolarian assemblages, dinoflagellate, and radiometric dating analysis of the tuff beds (Iwata & Tajika, 1986; Kiminami et al., 1990; Kurita & Tajika, 1998b). This study investigated six units in this group: The Mukaiengaru, Toyosato, Yasukuni, Asahino, Kamibaro, and Mizuho Units (Figure 14).

The Mukaiengaru Unit consists mainly of sandstones. The dinoflagellate cyst assemblage suggested that the age of this unit is the Early Eocene (Figure 14) (Kurita & Tajika, 1998). The Toyosato Unit has a total thickness of around 2 km and consists of sandstones with intercalations of thin conglomerate beds in the lower interval. In the upper interval of this unit, mud-prone alternations of thin sandstones and mudstones with intercalation of tuff and tuffaceous shale (Iwata & Tajika, 1986). The occurrence of the radiolarians assemblage suggested that this unit is the early Paleocene (Figure 14) (Iwata & Tajika, 1992). The Yasukuni Unit consists of sand-dominated alternations of sandstones and mudstones with intercalation of pebbly sandstone. It exceeds 1.5 km in total thickness (Iwata & Tajika, 1986). Iwata & Tajika (1986) reported that small numbers of radiolarians occurred in the upper part of the

Yasukuni Unit, which suggested the Late Cretaceous (Campanian) (Figure 14). Due to the low amount of radiolarian fossils, this unit is to be suggested as undetermined (see Figure 14). The Asahino Unit consists of mud-dominated alternating beds of sandstones and mudstones in the lower part. The unit becomes sand-rich successions in the upper part. The total thickness of this unit is approximately 1.4 km (Iwata & Tajika, 1986). The analysis of radiolarian fossils suggested the age to be the early Paleocene (Figure 14) (Iwata & Tajika, 1992). The Kamibaro Unit mainly consists of sandstone in the lower and upper parts and is predominated by mud-prone alternating beds in the middle part (Iwata & Tajika, 1986). The thickness of this unit exceeds 2 km (Iwata & Tajika, 1986). Iwata & Tajika (1986) reported the occurrence of the radiolarian fossils, implying the Late Cretaceous (Campanian) (Figure 14). However, they only discovered small amounts of radiolarians, so that this age estimation is uncertain (see Figure 14). The Onari Unit has a thickness of approximately 1 km and is composed mainly of shale intercalated with thin-bedded sandstones, acidic tuff, tuffaceous shale, color-varying shales, and calcareous nodules (Iwata & Tajika, 1986). Slump blocks of sandstone can also be observed in this unit (Iwata & Tajika, 1986). The analysis of radiolarian fossils suggested that the age of this unit is the Late Cretaceous (Upper Campanian) (Figure 14) (Iwata & Tajika, 1986). Alternating beds of sandstones and mudstones predominate the Mizuho Unit, sometimes intercalated with conglomerate and pebbly sandstone (Figure 14). It is approximately 4 km in thickness (Iwata & Tajika, 1986). Kiminami et al. (1990) reported that the radiometric age of this unit is 58.5 ± 1.3 Ma (Paleocene) (Figure 14) based on K-Ar age analysis from the tuff bed. The Wakasa Unit is composed mainly of sandstones and pebbly sandstones. Mud-prone successions of alternating beds are sometimes intercalated in this unit. The total thickness of this unit is approximately 0.8 km (Iwata & Tajika, 1986). Iwata & Tajika (1986) reported that no radiolarian fossils had been found in this unit. The Nakazono Unit consists of equal to mud-rich alternating beds of sandstone and mudstone, and the total thickness of this unit can exceed 1 km (Iwata & Tajika, 1986). The age of this unit was considered to be the Late Cretaceous (Uppermost Campanian or Lower Maastrichtian) (Iwata & Tajika, 1986).

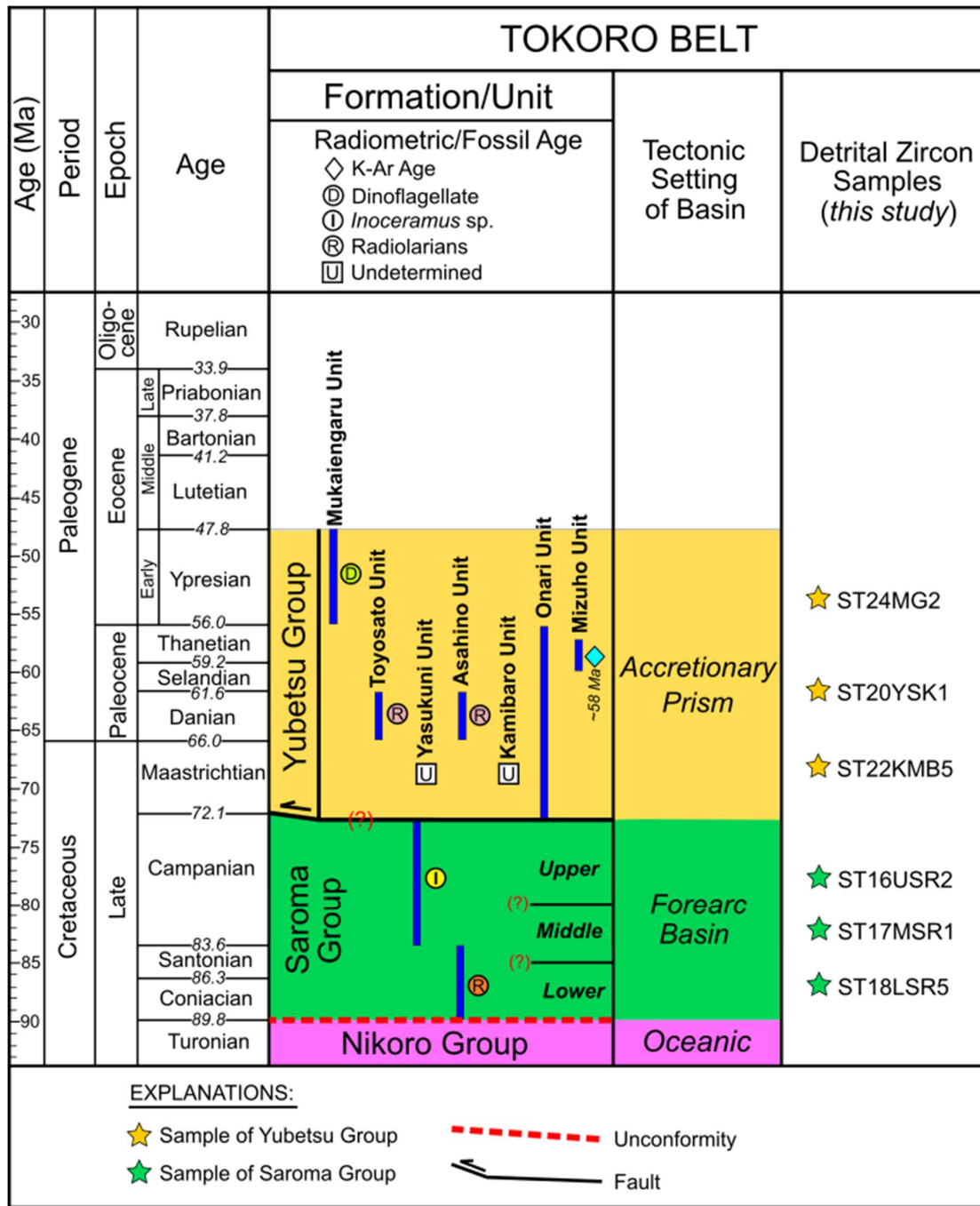


Figure 14. Stratigraphy column of the Nikoro, Saroma, and Yubetsu Groups in the Tokoro Belt. Radiometric dating is indicated by color: blue (Kiminami et al., 1990), and fossil ages from Radiolarians by colors: purple (Iwata & Tajika, 1992); red (Iwata et al., 1983). Dinoflagellate fossil from (Kurita & Tajika, 1998a). *Sphenoceramus schmidtii* from Sakakibara & Tanaka (1986). Interpretation of tectonic setting of basin: oceanic crust from Sakakibara (1986), Sakakibara et al. (1986); forearc basin from Kiminami et al. (1985); accretionary prism from Sakakibara et al. (1986), Tajika (1988).

3.3 Methods

3.3.1 Samples

The samples of sedimentary rocks were collected for the detrital zircon analysis from the outcrops in the Saroma, and Yubetsu Groups of the Tokoro Belt, eastern Hokkaido (Figure 13b and 13c; see Appendix 6.1 for information on all sampling locations in the Tokoro Belt). Three samples were taken from the Saroma Group (Figure 13c), and three samples were collected from the Yubetsu Group (Kamibaro, Yasukuni, and Mukaiengaru Units) (Figure 13b). Most of the samples are sandstones except for the mudstone from the Upper of the Saroma Group (see Table 3). The photographs of selected outcrops for sampled formations in the Tokoro Group are shown in Figure 15.

Table 3. Samples for U-Pb ages of detrital zircons from the Tokoro Belt, eastern Hokkaido.

Station	Strata Unit	Sample	Coordinate		Location	Sample
	(Gp./Un.)	Code	Longitude	Latitude		
<u>Saroma Group (Late Cretaceous)</u>						
ST.16	Upper Saroma	ST16USR2	143°55'19.69''	44°04'06.29''	Saroma	Mdst
ST.17	Middle Saroma	ST17MSR1	143°54'46.75''	44°04'08.34''	Saroma	Sst
ST.18	Lower Saroma	ST18LSR5	143°54'35.12''	44°04'11.88''	Saroma	Sst
<u>Yubetsu Group (Late Cretaceous – Paleogene)</u>						
ST.20	Yasukuni Unit	ST20YSK1	143°35'48.49''	44°03'57.82''	Saroma	Sst
ST.22	Kamibaro Unit	ST22KMB5	143°39'22.84''	44°06'43.69''	Saroma	Sst
ST.24	Mukaiengaru Unit	ST24MG2	143°32'27.54''	44°05'37.43''	Engaru	Sst
<i>Abbreviations: Gp. = Group; Mdst = Mudstone; Sst = Sandstone; ST = Station; Un. = Unit.</i>						



Figure 15. Photographs of selected outcrops for sampled formations from the Tokoro Group in eastern Hokkaido. (a) Nikoro Group from station 27. (b) Nikoro Group from station 28. (c) Upper of the Saroma Group from station 16. (d) Middle of the Saroma Group from station 17. (e) Mizuho Unit of Yubetsu Group from station 23. (f) Yasukuni Unit of Yubetsu Group from station 20.

3.3.2 Sample Preparation

The samples of sedimentary rocks were prepared for the geochronological analysis using the standard mineral separation techniques at the Kyoto University (e.g., crushing, panning, magnetic separation, and heavy-liquid density). About 200 zircon grains from each

sample were mounted under a binocular microscope, embedded in a 10 mm epoxy resin disk, and continued to polish process to approach half of the thickness of the zircon grains. This study mounted zircon grains in different grain sizes and shapes to obtain all ages information. The zircon imaging process was conducted through two steps. The first step was to photograph zircon grains under transmitted light (TL) and reflected light (RL) using an optical microscope. The second step was to take images of cathodoluminescence (CL) and backscattered electron (BSE) using JEOL Superprobe JXA-8105 at the Laboratory of the Department of Petrology and Mineralogy, Kyoto University. The photographs of the sample preparation steps are shown in Figure 16.

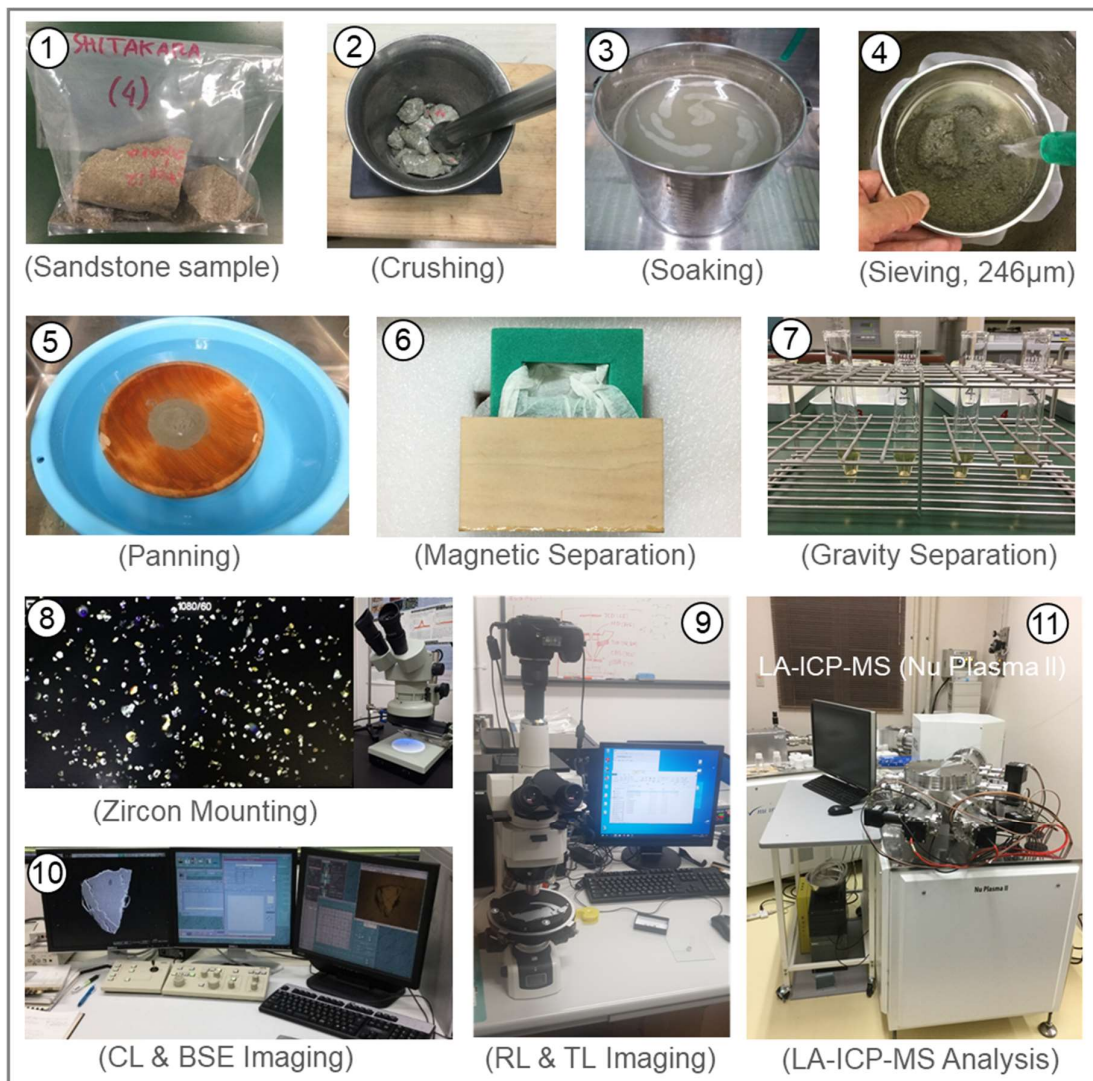


Figure 16. Steps of sample preparation for geochronological analysis.

3.3.3 Measurement of U-Pb Zircon Age

The laser ablation determined the zircon U-Pb ages from all samples in the Tokoro Belt–inductively coupled plasma–mass spectrometry (LA-ICP-MS) in the Geochemical Research Center at the University of Tokyo. The Nu Plasma II instrument was used in this study. Measurements were conducted using a wavelength of 260 nm, a fluence of 3.5–4.0 J/cm², and a spot size of 20 µm. NIST SRM 612 and Nancy 91500 were used as primary standards, and OD-3 and GJ-1 were used as secondary standards. The U-Pb concordia diagrams and probability density plots were illustrated using IsoplotR software (Vermeesch, 2018). The information on the operational setting of the LA-ICP-MS is summarized in Figure 17. This study applied Stacey-Kramers age correction (Cherniak & Watson, 2001) using IsoplotR software. This Stacey-Kramers correction is required for determining the youngest grain age precisely and enables to minimize the effect of loss of Pb (Cherniak & Watson, 2001).

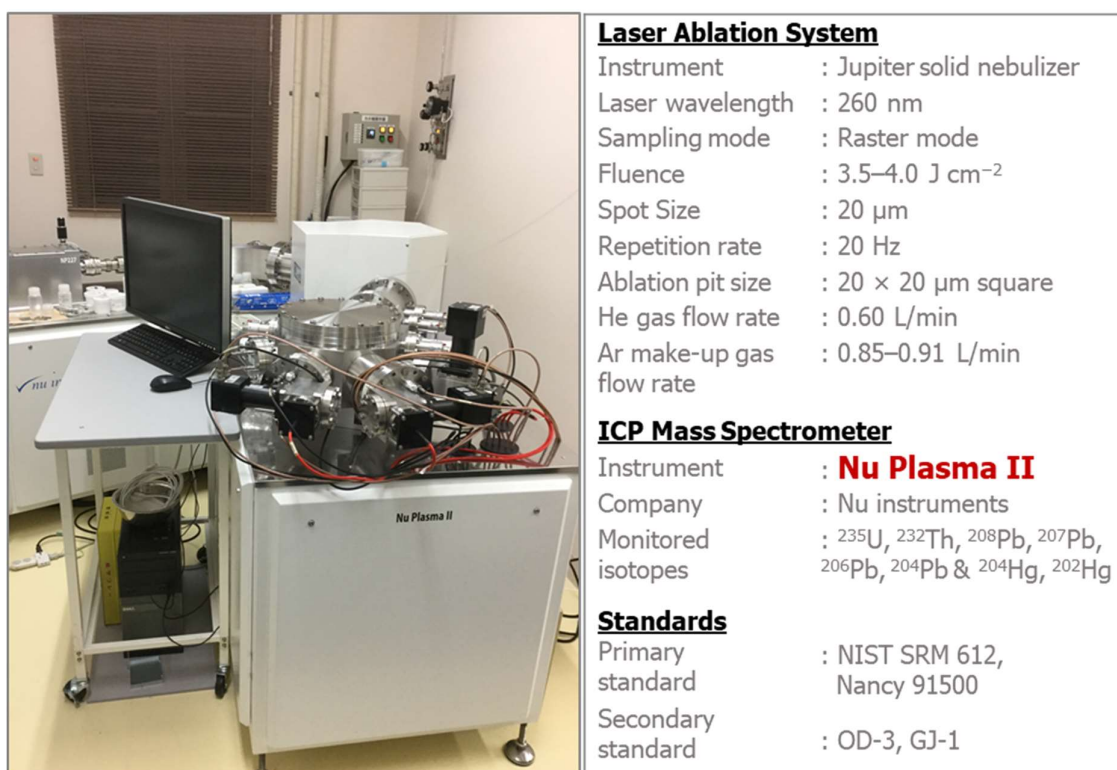


Figure 17. Instrumentation and operational setting of the LA-ICP-MS in this study. The measurement was performed at the Geochemical Research Center, The University of Tokyo.

3.3.4 Maximum Depositional Age

In this study, the maximum depositional ages (MDA) of the sedimentary rock samples were estimated from the calculated age of the youngest single grain (YSG) and the youngest graphical peak (YPP) based on the method of Dickinson & Gehrels (2009). The YSG is the age of the youngest single grain of the detrital zircon for each sample. On the other hand, the YPP is determined by identifying the first age peak from the age distribution of detrital zircon grains, whereas a single grain age peak is ignored (Dickinson & Gehrels, 2009).

This study applied degree of discordant filter is 10% due to yields of this study is a mix between Phanerozoic and Precambrian ages, and the relative proportion of those ages are important, so that way can still retain the Precambrian ages (Gehrels, 2012). This study also only filtering 10% discordant cutoff for old ages (>1.0 Ga) due to application of a discordance filter for young ages is generally not possible because of the large uncertainty of $^{206}\text{Pb}/^{207}\text{Pb}$ ages, and filtering based on discordance would bias the resulting age distribution toward young ages (Gehrels, 2012). The ages of young zircon grains (<1.0 Ga) use $^{206}\text{Pb}/^{238}\text{U}$ ages, whereas the ages of old zircon grains (>1.0 Ga) use $^{207}\text{Pb}/^{206}\text{Pb}$ ages (Dickinson & Gehrels, 2008, 2009; Gehrels, 2012; Gehrels et al., 2008). Zircon U-Pb ages with high discordance (>10%) were excluded from the calculations (See Appendix B for the results of the calculation). The formula of discordant in percentage is below:

When the age $^{206}\text{Pb}/^{238}\text{U}$ of zircon <1.0 Ga:

$$\text{Discordance} = \{1 - (^{206}\text{Pb}/^{238}\text{U Age}) / (^{207}\text{Pb}/^{235}\text{U Age})\} \times 100\%$$

When the age $^{206}\text{Pb}/^{238}\text{U}$ of zircon >1.0 Ga:

$$\text{Discordance} = \{1 - (^{206}\text{Pb}/^{238}\text{U Age}) / (^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$$

3.4 Results

3.4.1 Th/U Ratio

Th/U ratio of the detrital zircon grains in the samples was analyzed to distinguish the zircon grains between the magmatic and metamorphic origin (Hoskin & Black, 2000; Rubatto, 2002). The Th/U ratios of detrital zircon grains were calculated from sandstone samples of the Saroma and Yubetsu Groups in the Tokoro Belt. In the sandstone samples from the Tokoro Belt, a total of 472 detrital zircon grains were analyzed, and 99.79% of grains have Th/U >0.1 suggesting their magmatic origin and only 0.21% of grains have Th/U <0.1 suggesting the

metamorphic origin (Figure 18). The character of growth zoning texture within a zircon crystal predominates in sandstones from the Tokoro Belt and can be well observed in the cathodoluminescence (CL) images (Figure 19), indicative of magmatic origin (Corfu et al., 2003).

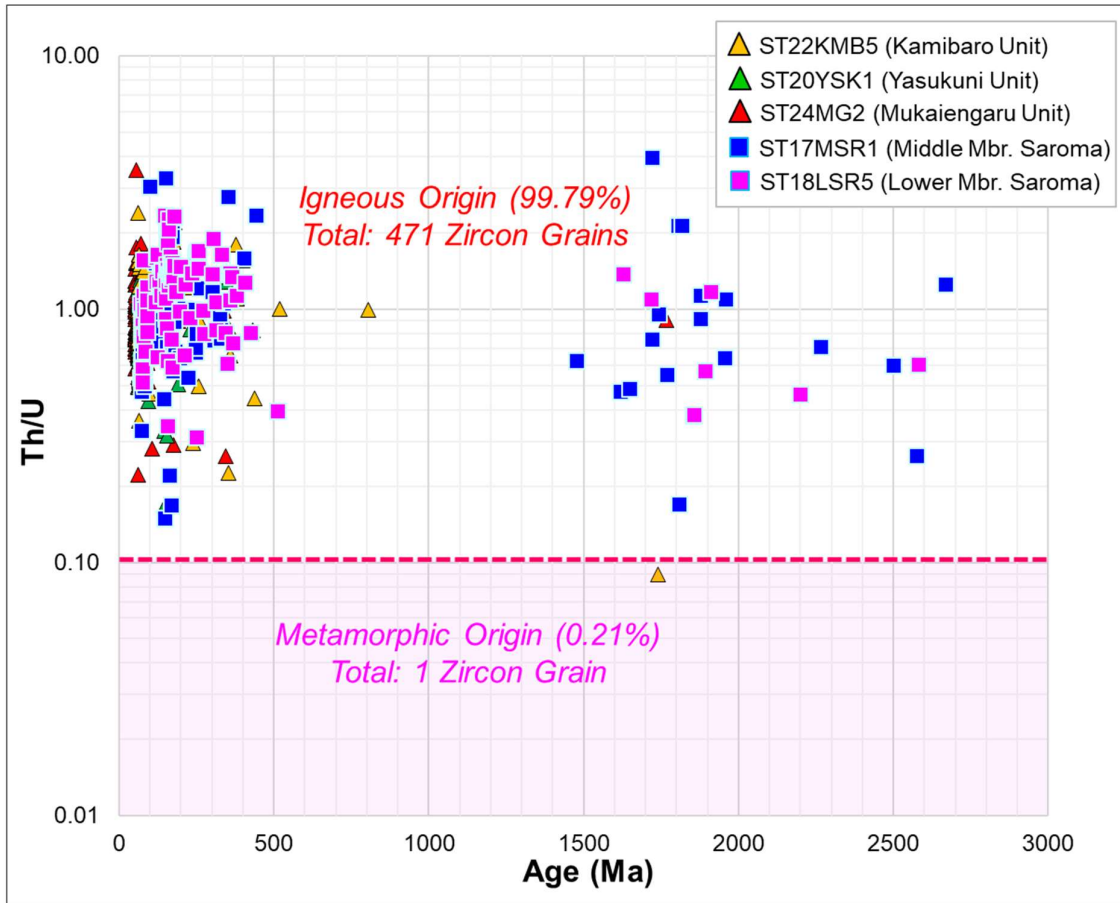


Figure 18. The Th/U ratio of detrital zircon grains from the Tokoro Belt. The zircon grains with Th/U > 0.1 usually indicates a magmatic origin and Th/U < 0.1 indicates a metamorphic origin (e.g., Hoskin & Black, 2000; Rubatto, 2002). Abbreviation: Mbr = Member.

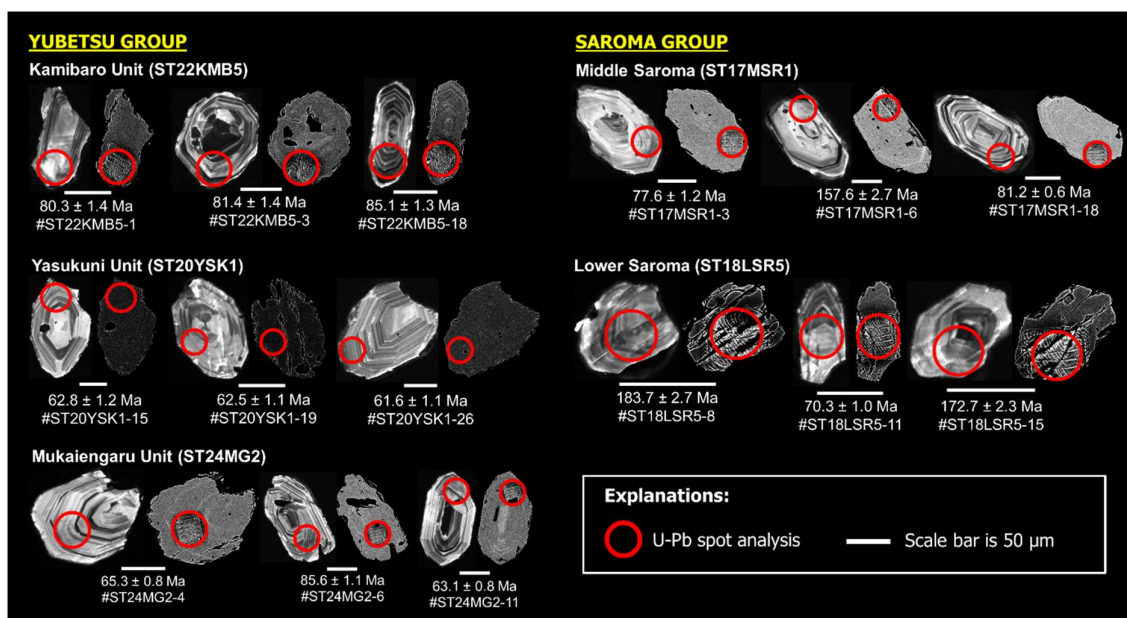


Figure 19. The cathodoluminescence (CL) and backscattered electron (BSE) images of selected zircon grains for sandstone samples of the Saroma and Yubetsu Groups in the Tokoro Belt. Red circles indicate the locations of the U-Pb spots. White scale bars are 50 μm long.

3.4.2 Detrital Zircon U-Pb Age Distributions

3.4.2.1 Saroma Group

In the Saroma Group, three samples of sedimentary rocks were analyzed: sandstone from the Lower of the Saroma Group (ST18LSR5), sandstone from the Middle of the Saroma Group (ST17MSR1), and mudstone from the Upper of the Saroma Group (ST16USR2).

In the sample taken from the Lower of the Saroma Group (ST18LSR5), a total of 84 zircon grains were analyzed, which exhibited a broad age spectrum. Detrital zircon grains in this sample ranged from the Archean to Cretaceous and were classified into six groups (Figure 21): Archean (1.19%), Proterozoic (8.33%), Paleozoic (22.62%), Triassic (5.95%), Jurassic (32.14%), and Cretaceous (29.76%). The most prominent age peak was 162 Ma, and subordinate peaks were 2.58 Ga, 2.20 Ga, 1.87 Ga, 350 Ma, and 82 Ma (Figure 20; Table 4). The YSG and YPP ages for the Lower of Saroma Group are 69.2 ± 1.1 Ma and 70 Ma (Table 4), corresponding to the Maastrichtian (Late Cretaceous).

In the Middle of the Saroma Group (ST17MSR1), a total of 104 zircon grains were analyzed, which exhibited a broad age spectrum. Detrital zircon grains in this sample ranged from Archean to Cretaceous and were classified into six groups (Figure 21): Archean (1.92%),

Proterozoic (15.38%), Paleozoic (11.54%), Triassic (8.65%), Jurassic (38.46%), and Cretaceous (24.04%). The most prominent age peak was 164 Ma, and subordinate peaks were 2.57 Ga, 1.80 Ga, 330 Ma, 245 Ma, and 77 Ma (Figure 20; Table 4). The YSG and YPP ages for the Middle of Saroma Group are 71.9 ± 2.0 Ma and 74 Ma (Table 4). Both ages correspond to the Maastrichtian and Campanian (Late Cretaceous), respectively.

A mudstone sample (ST16USR2) was taken from the Upper of the Saroma Group. However, no zircon grain was found during the hand-picking process.

3.4.2.2 Yubetsu Group

In the Yubetsu Group, three sandstone samples from three units were analyzed, i.e., the Mukaiengaru (ST24MG2), Yasukuni (ST20YSK1), and Kamibaro (ST22KMB5) Units.

In the sample taken from the Mukaiengaru Unit (ST24MG2), a total of 101 zircon grains were analyzed, which exhibited a single peak at 61 Ma (Figure 20; Table 4). Detrital zircon grains in this sample ranged from Proterozoic to Cenozoic and are classified into six groups (Figure 21): Proterozoic (0.99%), Paleozoic (2.97%), Triassic (0.99%), Jurassic (3.96%), Cretaceous (36.63%), and Cenozoic (54.46%). The YSG and YPP ages for the Mukaiengaru Unit are 52.5 ± 0.6 Ma and 54 Ma (Table 4), corresponding to the Ypresian (Early Eocene).

In the sample taken from the Yasukuni Unit (ST20YSK1), a total of 94 zircon grains were analyzed. The most prominent age peak was at 64 Ma, and the subordinate peak was at 170 Ma (Figure 20; Table 4). Detrital zircon grains in this sample ranged from Paleozoic to Cenozoic and were classified into five groups (Figure 21): Paleozoic (1.06%), Triassic (1.06%), Jurassic (10.64%), Cretaceous (11.70%), and Cenozoic (75.53%). The YSG and YPP ages for the Yasukuni Unit are 61.2 ± 1.1 Ma and 62 Ma (Table 4), corresponding to the Selandian and Danian (Paleocene), respectively.

In the sample taken from the Kamibaro Unit (ST22KMB5), a total of 89 detrital zircon grains were analyzed, and the age spectrum ranged broadly. The most prominent age peak was 74 Ma, and subordinate age peaks were 360 Ma and 174 Ma (Figure 20; Table 4). Detrital zircon grains in this sample ranged from Proterozoic to Cenozoic and were classified into six groups (Figure 21): Proterozoic (2.25%); Paleozoic (12.36%), Triassic (2.25%), Jurassic (15.73%), Cretaceous (49.44%), and Cenozoic (17.98%). The YSG and YPP ages for the

Kamibaro Unit are 63.1 ± 1.0 Ma and 64 Ma (Table 4), which both correspond to the Danian (Paleocene).

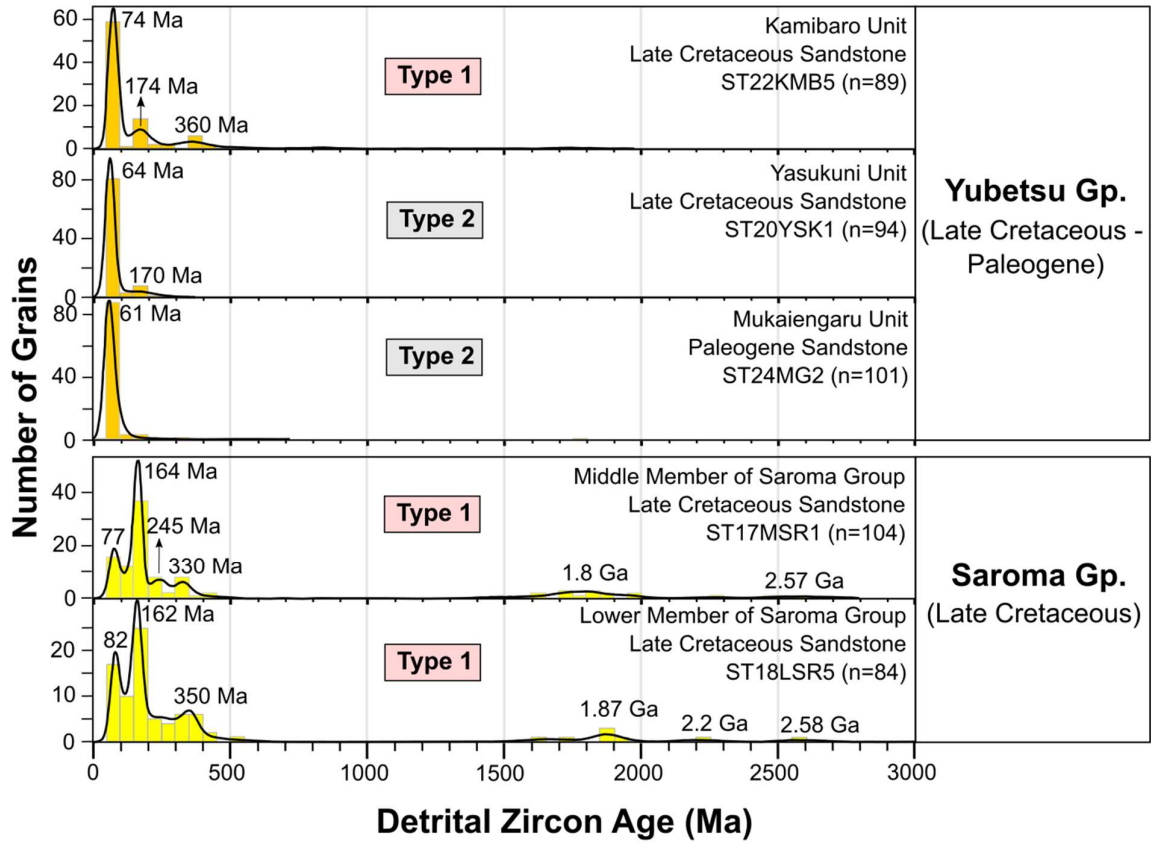


Figure 20. Detrital zircon U-Pb age distribution of the Saroma and Yubetsu Groups in the Tokoro Belt. Black line: KDE with 20 Myr bandwidth, and histograms are 50 Myr binwidth. Abbreviations: Gp. = Group, n = number of zircon grain analyses.

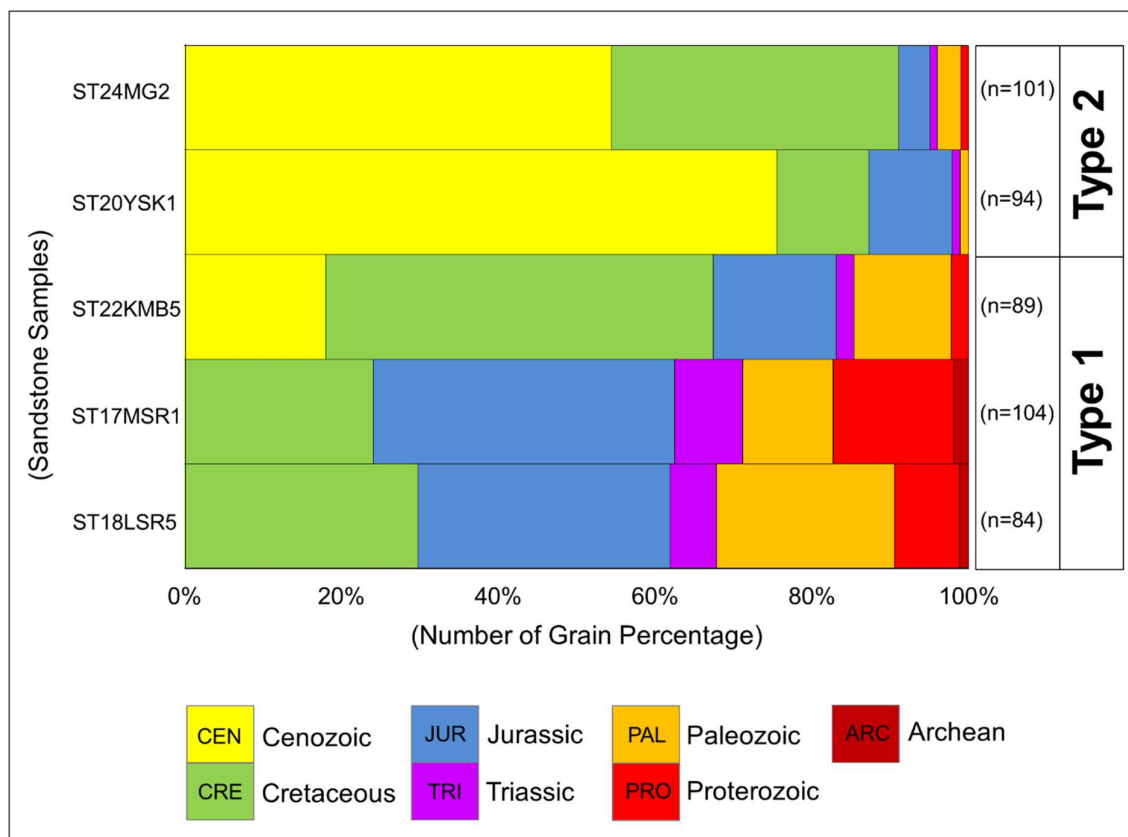


Figure 21. Stacked graph showing the percentage of detrital zircon age distributions for sandstones Type 1 and Type 2 of the Saroma and Yubetsu Groups in the Tokoro Belt through time. Abbreviation: n = number of zircon grain analyses.

Table 4. Summary of detrital zircon U-Pb analysis comparing with depositional ages from biostratigraphy/radiometric dating and MDA in the Saroma and Yubetsu Groups of the Tokoro Belt.

Unit/Member (Sample Code)	Sample Type	No. of U-Pb Analyses	Stratigraphy Age (Biostratigraphy/Radiometric Dating)	Age Spectra (Ma)	MDA		
					YSG (Ma ± 1σ)	YPP (Ma)	
<u>Saroma Group</u>							
Upper Member of Saroma (ST16USR2)	Mudstone	<i>N/A</i> ^{*)}	Late Cretaceous	Coniacian – Santonian	<i>N/A</i> ^{*)}		
Middle Member of Saroma (ST17MSR1)	Sandstone	104 (104)		Coniacian – Santonian	77, 164 , 245, 330, 1800, 2570	71.9 ± 2.0	74
Lower Member of Saroma (ST18LSR5)	Sandstone	84 (88)		Coniacian – Santonian	82, 162 , 350, 1870, 2200, 2580	69.2 ± 1.1	70
<u>Yubetsu Group</u>							
Kamibaro Unit (ST22KMB5)	Sandstone	89 (91)	Late Cretaceous – Paleogene	<i>Undetermined</i> ^{**)}	74 , 174, 360	63.1 ± 1.0	64
Yasukuni Unit (ST20YSK1)	Sandstone	94 (100)		<i>Undetermined</i> ^{**)}	64 , 170	61.2 ± 1.1	62
Mukaiengaru Unit (ST24MG2)	Sandstone	101 (104)		Early Eocene	61	52.5 ± 0.6	54

Note: ***)** Observation in the sample of the Upper of the Saroma Group (ST16USR2) showed no zircon grain existed.

****)** Both units (Kamibaro & Yasukuni) suggest the age to be undetermined due to small amount of radiolarian fossils (Iwata & Tajika, 1986).

The bold numbers at age spectra show the most prominent age peak.

See Appendix C for YSG results from samples in the Tokoro Belt

Abbreviations: MDA–Maximum Depositional Age; YPP–Youngest Graphical Age Peak; YSG–Youngest Single Grain Age.

3.4.3 Classification of U-Pb Age Distributions

Two types of the U-Pb age distributions can be identified in the results of the detrital zircons in the Saroma and Yubetsu Groups of the Tokoro Belt. Their characteristics are relatively similar to the types observed in sandstone samples of the Nemuro Belt. Here the sandstones Type 1 and 2 are defined by the multimodal and unimodal age distributions. Type 1 signature in the sandstone samples of the Tokoro Belt is characterized by the multimodal distribution with a broad range of the age containing Precambrian. On the other hand, Type 2 in the Tokoro Belt is characterized by the distribution with a single or two peak(s) without Precambrian grains.

Sandstones Type 1 were identified at three samples in the Tokoro Belt, two samples from Saroma Group (ST17MSR1 and ST18LSR5) and one sample from Yubetsu Group (ST22KMB5). The characteristic of this type is multimodal age distributions, ranging from Precambrian to Cenozoic (Figures 20 and 21). In this type, the Mesozoic age distributions are dominant, ranging from the Jurassic (174–162 Ma) to the Late Cretaceous (82–74 Ma) (Figure 20). The population of Precambrian zircon ages is distinctive in this Type 1, which exhibits scattered age distribution from Archean (~2.5 Ga) to Proterozoic (~1.8 Ga) (Figure 20). Cenozoic zircon ages were detected in this Type 1 (i.e., ST22KMB5) with 17.98% (Figure 21). Cenozoic zircon ages in this Tokoro Belt were the same as detected in the Nemuro Belt (i.e., ST15KR5).

The Type 2 signatures were identified in two sandstone samples from the Tokoro Belt. Both samples were from Yasukuni (ST20YSK1) and Mukaiengaru (ST24MG2) Units of the Yubetsu Group (Figure 20). This Type 2 is characterized by the unimodal distribution which is predominantly by Cenozoic age populations, whose peaks were 64 and 61 Ma for Yasukuni and Mukaiengaru Units, respectively (Figure 20). Another distinct characteristic of Type 2 is the scarcity of Precambrian zircons (Figures 20 and 21), with the same evidence as found in the samples from the Nemuro Belt. This characteristic is opposite to sandstones Type 1. The Precambrian zircons in Type 2 were only identified in the Mukaiengaru Unit (ST24MG2) with a minor amount, less than 1% of the distribution (Figure 21).

Type 1 distribution of the Tokoro Belt is identical to that of Type 1 in the Nemuro Belt (see Chapter 2). Characteristics of Type 2 distribution of the Tokoro Belt are nearly similar to

those of Type 2 in the Nemuro Belt. However, the Type 2 distribution in the Yasukuni Unit of the Tokoro Belt also exhibits a subordinate peak around 170 Ma (Jurassic).

3.5 Discussion

3.5.1 Depositional Ages of the Tokoro Belt (the Saroma and Yubetsu Groups)

This study examined the maximum depositional ages of the Yubetsu and Saroma Groups from the U-Pb age distributions of detrital zircon grains to constrain the depositional ages of the Tokoro Belt.

In this study, the YSG and YPP ages resulted at ca. 72 Ma and 74 Ma for the ages of the Middle of the Saroma Group (ST17MSR1) and ca. 69 Ma and 70 Ma for the ages of the Lower of the Saroma Group (ST18LSR5) (Figure 22; Table 4). The age of the Saroma Group has been considered the Late Cretaceous based on radiolarians analysis (Iwata et al., 1983). In addition, a study from Sakakibara & Tanaka (1986) reported the occurrence of the inoceramid fossil (*Sphenoceras schmidtii*), which is the index fossil of the Campanian, the Late Cretaceous (Shigeta & Tsutsumi, 2018). Therefore, the YPP ages are consistent with the biostratigraphic results of the previous studies (Figure 22).

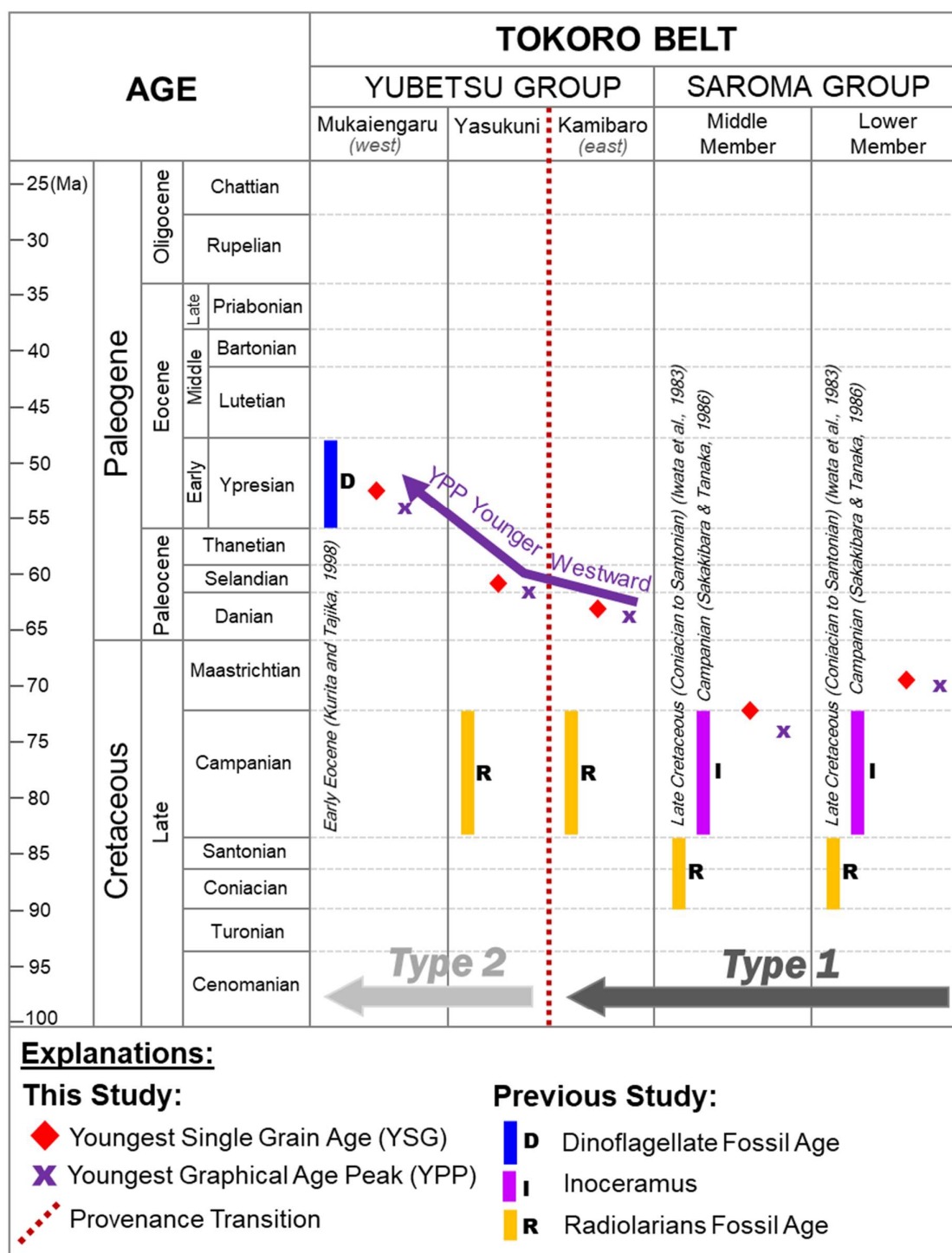
This study calculated the YSG and YPP ages from three units, i.e., Mukaiengaru (ST24MG2), Yasukuni (ST20YSK1), and Kamibaro (ST22KMB5) Units. In the Yubetsu Group, the age has been considered to range from the Paleocene to the Eocene based on radiolarian assemblages, dinoflagellate, and the radiometric dating analysis of the tuff beds (Iwata & Tajika, 1986; Kiminami et al., 1990; Kurita & Tajika, 1998b). Iwata & Tajika (1986) and Tajika (1988) investigated the radiolarian biostratigraphy in this region. They reported that the radiolarian assemblages of the Onari and Mizuho Units were highly similar to the *Amphipindax ensseffi* assemblage that occurred in the Kamchatka Peninsula (Vishnevskaya, 1986). This assemblage is of the middle to the late Campanian (Iwata & Tajika, 1986; Vishnevskaya, 1986). On the other hand, the radiolarian assemblages of the Toyosato and Asahino Units were defined as *Lithostrobos* sp. and *Protoxiphotractus perplexus* assemblage. This assemblage also contained *Clathrocyclas diceros* that is the index fossil of the late Campanian to the early Maastrichtian, according to Vishnevskaya (1986). However, no index radiolarian fossils occurred in the Mukaiengaru, Yasukuni and Kamibaro Units in their studies (Iwata & Tajika, 1986; Jun Tajika, 1988). Later, Iwata & Tajika (1992) reexamined the

radiolarian biostratigraphy of the Yubetsu Group, and suggested that both the Toyosato and Asahino Units are Early Paleocene. Also, Tajika & Yahata (1991) implied that the Onari Formation could be correlated to the period from the Maastrichtian to Paleocene. Later, Kurita & Tajika (1998a) reported that the dinoflagellate assemblage from the Mukaiengaru Unit implies the Early Eocene. In addition, Kiminami et al. (1990) examined the radiometric age of the tuff bed in the Mizuho Unit and indicated that the Unit was deposited in the Paleocene (58.5 Ma). In summary, the Yubetsu Group ranges in age from the early Paleocene to the early Eocene, while the ages of several units, including the Yasukuni and Kamibaro Units, have been undetermined.

This study revealed that the YSG and YPP ages from the Mukaiengaru Unit (ST24MG2) were ca. 52 Ma and 54 Ma, corresponding to the Ypresian (Early Eocene) (Figure 22; Table 4). The previous study from the dinoflagellate assemblage implied the age of this unit to be the Early Eocene (Kurita & Tajika, 1998a) is coeval with the previous estimation (Figure 22).

Also, this study first reports the age estimates of the Yasukuni and Kamibaro Units. The YSG and YPP ages from the Yasukuni Unit (ST20YSK1) were ca. 61 Ma and 62 Ma, respectively, which is correlated to the Paleocene (Figure 22; Table 4). In the Kamibaro Unit (ST22KMB5), the YSG and YPP ages were ca. 63 Ma and 64 Ma (Figure 22; Table 4) correspond to the Paleocene. Thus, both ages from YSG and YPP of this unit are almost coeval.

To summarize, our U-Pb dating of the detrital zircon grains revealed that the Mukaiengaru, Yasukuni, and Kamibaro Units of the Yubetsu Group were deposited after the early Paleocene. Both the YPP and YSG ages were consistent with the depositional ages estimated by the biostratigraphic studies. The YPP's ages in the Yubetsu Group are getting younger westward from the Kamibaro to Mukaiengaru Units (Figure 22).



3.5.2 Provenance Transition in the Tokoro Belt

The U-Pb age distribution of detrital zircon grains in sandstones implied that the provenance transition in the Tokoro Belt occurred between the deposition of the Kamibaro and Yasukuni Units (Figures 20 and 21). This transition was identified from the different age distributions between Type 1 and Type 2 sandstones (Figure 20). Type 1 sandstones occurred in the Upper Cretaceous successions (the Saroma Group) and the succession deposited after the early Paleocene (the Kamibaro Unit of the Yubetsu Group). Type 2 sandstones occurred in the Yasukuni and Mukaiengaru Units of the Yubetsu Group that were deposited after the early Paleocene and the early Eocene. The YPP ages of the Kamibaro and Yasukuni Units yielded 64 Ma and 62 Ma, respectively. Thus, based on the maximum depositional age, the provenance transition in the Tokoro Belt occurred during the deposition of the Yubetsu Group between the Kamibaro and Yasukuni Units, and the period is presumably during Paleocene (after ~63 Ma) (Figure 20; Tabel 4). This transition of the Tokoro Belt's sediment provenance occurred nearly similar period in the Nemuro Belt, which was also confirmed during the Paleogene between 62 Ma and 54 Ma.

3.5.3 Younger Westward of the YPP Ages in the Yubetsu Group

This study identified the trend of the maximum depositional age (the YPP ages) of the lithostratigraphic units tend to be younger westward, particularly in the Yubetsu Group (see purple arrow in Figure 22). The sandstone samples of the Kamibaro to Mukaiengaru Units exhibited the YPP ages as follows: 64 Ma (Kamibaro Unit), 62 Ma (Yasukuni Unit), and 54 Ma (Mukaiengaru Unit).

The trend of the depositional ages in the Yubetsu Group contradicts the apparent stratigraphic position in the Group, suggesting the hypothesis that the origin of the Group is the accretionary complex of the Paleo-Kuril Arc (Tajika & Yahata, 1991; Tajika, 1988). The Yubetsu Group in this study area strikes NNE to SSW and dips eastward (Tajika & Yahata, 1991). Thus, the younger-eastward trend is supposed from this monoclinic geological structure. However, the biostratigraphy implied the younger westward trend in the depositional age. Tajika & Yahata (1991) proposed that the Yubetsu Group is the accretionary complex, and thrust faults bound the lithostratigraphic units. The YPP ages of the Mukaiengaru, Yasukuni, and Kamibaro Units newly obtained in this study support their view. Thus, it can be supposed that the Yubetsu Group was initially deposited in the trench of the Paleo-Kuril Arc.

The same evidence was also reported by Nanayama et al. (2021), wherein they suggested that the deposition in the Yubetsu Group has a trend younging to the west, indicating that the accretionary prism in front of the Paleo-Kuril Arc.

3.6 Conclusions

Based on detrital zircon U-Pb dating from the Saroma and Yubetsu Groups in the Tokoro Belt, this study reaches the following conclusions:

1. There are two detrital zircon U-Pb type signatures developed in the sandstones of the Tokoro Belt. Type 1 signature is characterized by widespread peaks (multimodal age distribution) from Precambrian to Cenozoic ages. Sandstones of this Type 1 occurred in the Late Cretaceous Saroma Group and the Paleocene Kamibaro Unit of the Yubetsu Group. A single peak (unimodal age distribution) characterizes the Type 2 signature, dominated mainly by the Paleogene ages. Sandstones of this Type 2 were collected in the Paleocene Yasukuni and the Eocene Mukaiengaru Units of the Yubetsu Group.
2. Provenance transition can be identified in the Tokoro Belt during the deposition of the Yubetsu Group between Kamibaro and Yasukuni Units. This transition occurred during the Paleocene period after ~63 Ma (Danian).

4 Provenance Analysis and Tectonic Evolution of the Paleo-Kuril Arc

This study analyzed the provenance sources of the Paleo-Kuril Arc based on detrital zircon age spectra from sandstone samples in the Nemuro and Tokoro Belts. The result shows two types of signatures developed in the study area, which recognize as sandstones of Type 1 and Type 2, as described below.

4.1 Provenance Analysis of the Paleo-Kuril Arc

4.1.1 Sandstone Type 1 Signature

The detrital zircon age distributions of Type 1 in the Nemuro and Tokoro Belts exhibit a multimodal distribution with peaks ranging from Cenozoic to Precambrian (e.g., ca. 1.9–1.8 Ga) (Figures 9 and 20). The spectrum of zircon ages in all samples shows a relatively similar pattern (Figures 10 and 21), indicating a stable provenance during their deposition. Most of the zircon grains of Type 1 have high Th/U ratios of >0.10 (Figures 7a and 18) and show typical oscillatory zoning under the cathodoluminescence images (Figures 8 and 19). This evidence indicates their derivation from magmatic rocks. In the case of the Nemuro Belt, paleocurrent data suggested that the formations yielding Type 1 sandstones had sediment sources in north/northwest regions (Figure 6) (Naruse, 2003).

As in deposits of other continental arcs, the signature of Type 1 is interpreted to be a mixture of both local volcanic sources and continental cratons (or recycled deposits). Type 1 distribution contains young clastic zircons with a peak at ca. 80 Ma (Figure 9). This age is close to that of the volcanic rocks near the base of the Nemuro Group. Shibata (1986) reported that the volcanic rocks in the Nokkamappu Formation, the lowermost formation of the Nemuro Group, were formed at ca 75–76.2 Ma based on the K-Ar ages. The Nemuro and Saroma Groups are the forearc deposits of the magmatic arc, and therefore, it is natural that the Jurassic to Late Cretaceous age peaks of detrital zircons were also sourced from the local magmatic region. In most areas in the East Asia regions, such as Sakhalin (Zhao, Li, et al., 2017), Sikhote-Alin (Nadanhada Terrane) (Zhou et al., 2014), South Korean (Choi et al., 2016), North Korean (Choi et al., 2016), Kamchatka (Sredinny Massif) (Bindeman et al., 2002), southwest Japan (Aoki et al., 2012), and northeast Japan (Ishizaka et al., 2021), predominant zircon ages range from Early Jurassic to Late Cretaceous (Figure 23). Thus, this period is characterized by intense magmatic activity and metamorphism. The Jurassic to Cretaceous magmatic rocks have been

widely reported from northeast China (Wu et al., 2011), South China (Li, 2000), South Korea (Kim et al., 2016; Zhang et al., 2012), southwest Japan (Sato et al., 2016; Yamamoto, 2003), and Sikhote-Alin (Zhao, Jahn, et al., 2017).

On the other hand, Precambrian zircons are essential features in this Type 1 signature. The prominent peaks exist at ~ 1.9 – 1.8 and ~ 1.7 – 1.6 Ga (Figure 9). This evidence indicates that the Paleo-Kuril Arc, which covers the Nemuro and Tokoro Belts, was connected to some continental cratons until the Paleocene (70 Ma). This age distribution of detrital zircon grains is similar to those observed in the metamorphic rock of the Sredinny Massif distributed in the Kamchatka Peninsula (Figure 23) (Bindeman et al., 2002). The Sredinny Massif is the Upper Mesozoic high-grade metamorphic rocks (i.e., granulites, amphibolites, migmatites, and granites) exposed in the southern part Sredinny Range, the western Kamchatka (Vaes et al., 2019). Bindeman et al. (2002) indicated that the zircon grains in the Sredinny Massif are composed of mixtures of the detrital and metamorphic origins, exhibiting the older (2800–96 Ma) and the younger (77 and 53–47 Ma) ages, respectively. Detrital zircon age distributions from Sredinny Massif contain a broad spectrum, and Precambrian zircons ranging in age from Archean to Proterozoic are abundant (i.e., more than 30%). The Late Cretaceous zircons also exhibit a prominent peak (Figure 23). They interpreted that the Sredinny Massif was a part of the Okhotsk Plate (Okhotomorsk Block), and the sediment in the Sredinny Massif was sourced from both the Siberian continent and the local, continental magmatic arc. Considering the similar pattern in the zircon age distribution of the Nemuro and Tokoro Belts (Figure 23), the Paleo-Kuril Arc is also interpreted to have developed as a continental magmatic arc and to have had a sediment provenance similar to other regions around the margin of the Okhotsk Plate.

Although unlikely, given possible paleogeographic reconstructions, it cannot be excluded entirely the possibility that the North China Craton (NCC) or South China Craton (SCC) was the sediment source of the Paleo-Kuril Arc. Previous studies of East Asian arcs such as the southwestern Japan Arc and Sakhalin regions suggested that the potential provenance for Precambrian zircons in those regions deposited before 90 Ma were derived mainly from the NCC and SCC (e.g., Aoki et al., 2012; Isozaki et al., 2010; Wu et al., 2008; Zhang et al., 2014; Zhao & Zhai, 2013; Zhao, Li, et al., 2017). The age distribution of zircon grains obtained from NCC is characterized by abundant Paleoproterozoic age peaks at ca. 1.8 Ga (Rojas-Agramonte et al., 2011) were detected in the sandstone samples of this study area (Figure 23). In contrast, this peak is not prominent in the age distribution of the detrital zircon grains of the SCC (Xiang & Shu, 2010) (Figure 23).

4.1.2 Sandstone Type 2 Signature

Type 2 signature of detrital zircons is characterized by unimodal distribution with the predominant peaks ranging from ca. 64 to 52 Ma (Figures 9 and 20), corresponding to the Paleocene–Early Eocene. Type 2 signature is found from the uppermost Nemuro Group (i.e., Shiomi Formation) to the Urahoro Group (i.e., the Beppo, Harutori, Tenneru, Yuubetsu, and Shitakara Formations) (Figure 9), and the Yubetsu Group (i.e., the Mukaiengaru and Yasukuni Units) (Figure 20). This Type 2 signature is an entirely different pattern from Type 1. Similarity and consistent patterns in zircons distribution from samples of Type 2 indicate a stable provenance system during deposition of all formations (Figures 9 and 20). Most of the Cenozoic detrital zircons have high Th/U ratios of >0.10 (Figures 7b and 18) and show typical oscillatory zoning under the cathodoluminescence images (Figures 8 and 19). This evidence indicates their derivation from magmatic rocks.

Paleocurrent data of the Urahoro Group that yielded zircon grains showing Type 2 signatures are more diverse than zircon grains of Type 1 signature in the Hamanaka and Akkeshi Formations of the Nemuro Group. The paleocurrents measured from the conglomerates in the Beppo and Harutori Formations, which are the lowermost formations of the Urahoro Group, exhibited directions from northeast or east. In contrast, all other formations except the Shitakara Formation exhibit paleocurrent directions from south or southwest (Nanayama et al., 1994). The paleocurrent direction in the Shitakara Formation is bi-directional from south and north, suggesting that this formation may have been deposited in the tide-influenced environment. This transition of the paleocurrent directions at the upper boundary of the Harutori Formation has been attributed to change in provenance areas of the Urahoro Group (Nanayama et al., 1994). However, the distribution of the detrital zircon ages exhibited no significant difference in all formations of the Urahoro Group. In addition, the sandstone taken from the Shiomi Formation of the Nemuro Group indicated the Type 2 signature of age distribution. Thus, changes in the source of sandstone cannot be detected in the Urahoro Group. However, the transition of the paleocurrent directions was reported between the Harutori and Tenneru Formations. This could be explained by the possibility that source rocks with similar zircon age distributions were exposed in northern and southwestern source areas.

Paleogene age peaks (ca. 64–52 Ma) characterize this Type 2 feature. Although detrital zircons exhibiting Paleoproterozoic ages were also obtained in this Type 2, their occurrences were minimal (only about 1%) which probably recycled (Figure 10), indicating that Type 2 only derived from a single source of the Paleogene magmatic region. Other cratons/blocks, as

shown in Type 1, did not contribute as sediment sources. Thus, there was a transition of provenance in both the Nemuro and Tokoro Belts from multiple to local source regions (Figures 10 and 21). The Paleo-Kuril Arc might have been isolated between ca. 64–52 Ma, judging from the depositional ages of the uppermost Nemuro Group and the Yubetsu Group. The deposits of the Paleo-Kuril Arc after this period were probably sourced from volcanic rocks that erupted in the Arc or their recycled sediments.

During the period 60–52 Ma, several studies suggested that the subduction of the ridge between the Izanagi and Pacific Plates led to an increase of volcanic activity at many subduction margins in the North Pacific region. For example, intense magmatic activity during Paleocene to the early Eocene was reported in the Sikhote-Alin region (Grebennikov et al., 2021; Liu et al., 2020). Yamasaki et al. (2021) also revealed three magmatic periods from 46 to 18 Ma (i.e., middle Eocene to early Miocene) developed in the Hidaka magmatic zone, which could be related to the Izanagi-Pacific ridge subduction. Judging from the ages of detrital zircons, volcanic activity in the Paleo-Kuril Arc increased simultaneously with these areas, suggesting that the arc may have experienced a similar tectonic activity in the continental arcs as described above.

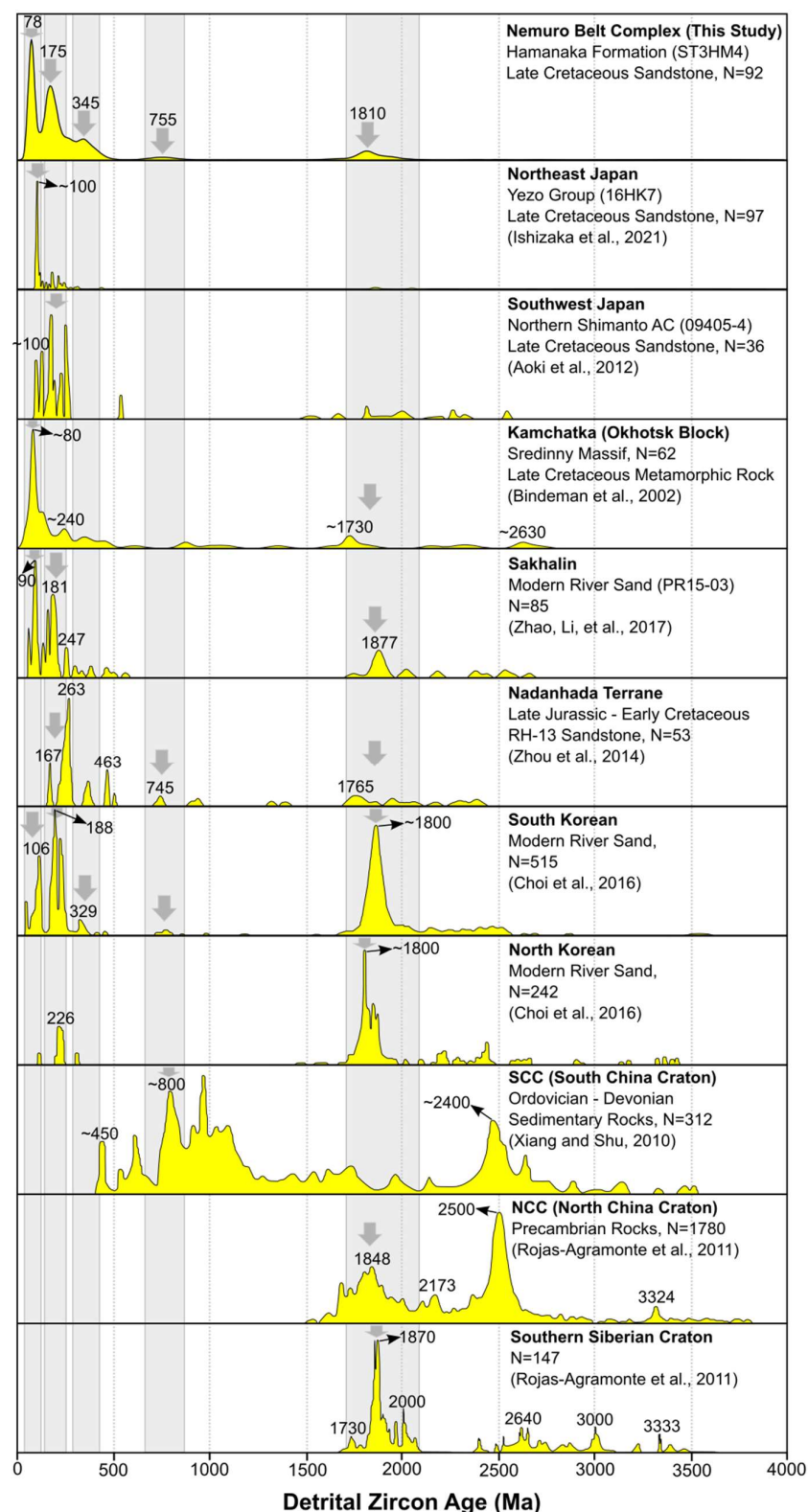


Figure 23. Comparison of detrital zircon age distribution from Nemuro Belt complex (this study) and other regions. The gray bars exhibit ranges of detrital zircon age from ca. 1.8 Ga, 755 Ma, 345 Ma, 175 Ma, and 78 Ma. Abbreviation: N = number of analyses.

4.2 Comparison of Detrital Zircon U-Pb age Distributions between the Paleo-Kuril and Paleo-Northeast Japan Arcs

Here this study compares characteristics of the U-Pb age distributions of detrital zircon grains between the Paleo-Kuril Arc and Paleo-Northeast Japan Arc (Ishizaka et al., 2021). Ishizaka et al. (2021) examined the detrital zircon data of the sedimentary rocks in the Early Cretaceous to Paleogene Yezo Group of the Sorachi-Yezo Belt, the Paleo-NE Japan Arc. Their study measured eleven samples of sedimentary rocks in the Mikasa and Oyubari areas (Figure 24).

The zircon grains in sedimentary rock samples of the Sorachi-Yezo Belt are characterized by gradual change in the age distributions, while those obtained from the Late Cretaceous to Paleogene sandstones in the Nemuro and Tokoro Belts exhibit the instantaneous change from the multimodal to unimodal distributions (Figure 24). Sandstones collected from the Cretaceous successions in the Sorachi-Yezo Belt and the tectonic belts in the PKA contained abundant Cretaceous zircons. Precambrian zircon grains are common in the PKA and the Lower Cretaceous of the Yezo Group (Figure 24), but their proportion decreases in time in the case of the Yezo Group. The detrital zircon grains exhibiting the Jurassic, Triassic, and Paleozoic ages also temporally decrease so that the age distribution of zircons in the Sorachi-Yezo Belt becomes nearly unimodal in the Upper Cretaceous to the Paleogene sandstones. In contrast, the proportion of the zircon grains showing the U-Pb ages from the Precambrian to Jurassic remains almost constant until the Paleocene sandstones in the Nemuro and Tokoro Belts of the PKA. Then, they suddenly disappear in the Eocene sandstones, resulting in the unimodal age distribution of the detrital zircon grains.

These results indicate that the two adjacent arc-trench systems experienced considerably different tectonic histories. Given the presence of Precambrian zircon, both the Paleo-Kuril Arc and the Northeast Japan Arc were undoubtedly connected to the continental crusts during the Cretaceous. It has also been known that the detrital zircon grains exhibiting ages older than the syn-depositional ages decrease gradually with time in the Cretaceous sandstones of the Southwest Japan and Northeast Japan Arcs, not only in the Sorachi-Yezo Belt (Isozaki et al., 2010). Isozaki et al. (2010) interpreted that the formation of a sizeable topographic barrier in the middle axis of the Arcs in the Late Cretaceous, such as a granitic mountain range, caused the disappearance of the detrital zircon grains that had the origins of the continental crusts. On the other hand, the trend of zircon age distribution in the Paleo-Kuril

Arc is quite different, indicating that this area experienced some major tectonic event(s) from the Paleocene to the Eocene. The possible tectonic events that influenced the provenance transition in the PKA are discussed in the next section.

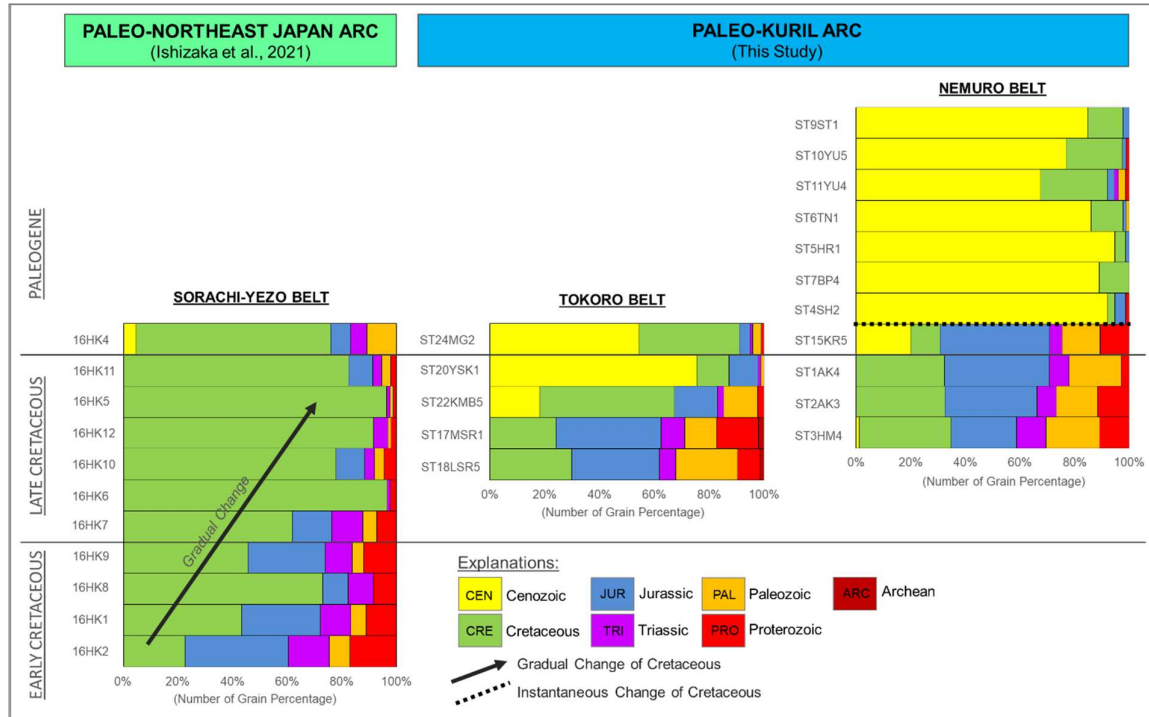


Figure 24. Comparison of percentage of detrital zircons age distributions for sedimentary rocks between Paleo Kuril-Arc (this study) and Paleo-Northeast Japan Arc (Ishizaka et al., 2021), Hokkaido, northern Japan.

4.3 Tectonic Evolution of the Paleo-Kuril Arc

We propose a tectonic evolution model of the Paleo-Kuril Arc based on the models of Kimura & Tamaki (1986) and Katagiri et al. (2019), and compared it with the contradictory tectonic model from Domeier et al. (2017). This study's tectonic model is based on U-Pb geochronological data obtained from sandstone samples in the Nemuro and Tokoro Belts. The paleomagnetic data of Katagiri et al. (2019) in the Nemuro Belt complex is also considered. The tectonic history of the Paleo-Kuril Arc can be divided into four stages: The Late Cretaceous, the Paleocene to the early Eocene, the middle to late Eocene, and the early Miocene to the present (Figure 26).

4.3.1 Late Cretaceous Period

This study proposes that the Paleo-Kuril Arc during the Late Cretaceous was a continental magmatic arc located at the southern end of the Okhotsk Plate (Figure 26a). During this period, the sandstone Type 1 was deposited in the Hamanaka, Akkeshi, and Kiritappu Formations of the Nemuro Belt, the Lower, and Middle of the Saroma Group, and the Yasukuni Unit of the Tokoro Belt. This Type 1 signature had multiple provenance sources, including Precambrian cratons. Thus, this study suggests that the Paleo-Kuril Arc was a part of the Okhotsk Plate during this period. As described above, Bindeman et al. (2002) reported that the U-Pb detrital zircon dating of metamorphic basements in the Sredinny Massif of Kamchatka (Figure 23), showed similar peaks and ages spectrum with our samples obtained from the Nemuro and Tokoro Belts (Figure 23). Thus, although the Kuril Arc is currently separated from the Okhotsk Plate by the Kuril Basin, it is reasonable to consider that the basin had not developed yet in this period. The siliciclastic materials in the Paleo-Kuril Arc were provided directly from the cratons in the Okhotsk Plate. Several studies (Kiminami, 1983; Maeda, 1990) also proposed that the Okhotsk Plate partially or entirely provided the sediment in the Nemuro Group. Since the sedimentary rocks of the Nemuro Group also contain a large number of zircons showing syn-sedimentary ages (~80 Ma), the Paleo-Kuril Arc is considered to have been a magmatic arc that developed on the margin of the Okhotsk Plate.

During this period, the oceanic plate subducting into the Okhotsk Plate has been estimated to be the Izanagi Plate (Seton et al., 2015; Yamasaki et al., 2021) (Figure 26a). At this period, the Cretaceous Yezo Group, which distributes from NE Japan to the northern Sakhalin, was formed as a forearc basin deposit along the eastern margin of the Eurasian Plate (Kimura et al., 2019), so that the Okhotsk Plate had not yet been joined to the Eurasian Plate (Figure 26a). Thus, Izanagi Plate was subducting to both Okhotsk Plate and the Eurasian Plate in the Late Cretaceous (Figure 26a).

Our proposed model appears to contradict the hypotheses assuming that the Paleo-Kuril Arc developed as an intra-oceanic island arc between the Izanagi and the Pacific Plates in the middle Pacific Ocean (Figure 26e) (e.g., Bazhenov & Burtman, 1994; Domeier et al., 2017). Judging from the detrital zircon analysis, this hypothesis of the intra-oceanic origin of the Paleo-Kuril Arc is difficult to accept. If the Paleo-Kuril Arc system developed along the boundary between two oceanic plates, the sediment in the forearc basins of the arc system should not contain abundant Precambrian clastic particles, which must be supplied from continental cratons. If any, only a minimal number of reworked particles would be present.

However, it should be noted that the paleomagnetic data suggested that the Arc had located south of the current location or almost no translation (Bazhenov & Burtman, 1994; Katagiri et al., 2019). The paleomagnetism of the Nemuro Group in the Shikotan Island suggested paleolatitudes of $36.5^{\circ} \pm 4.0^{\circ}$ and $34.5^{\circ} \pm 5.9^{\circ}$ (Bazhenov & Burtman, 1994), which are significantly southward from its current position ($\sim 43^{\circ}$). Nifuku et al. (2009) also measured the paleomagnetic data from the mudstones of the Nemuro Group. They indicated that the paleomagnetic inclination was in the range similar to measurements of Bazhenov & Burtman (1994). In addition, Katagiri et al. (2019) reported that the Eocene Urahoro Group in the Paleo-Kuril Arc did not exhibit significant northward or southward translation from the current position based on the comparison of paleomagnetic measurements with an APWP for East Asia observed by Cogné et al. (2013). If these reconstructions of the paleolatitudes are correct, and if the Kuril Arc finally moved southward along the dextral slip zone, it should be assumed that the Kuril Arc moved initially northward and then southward for thousands of kilometers, respectively.

Further research is needed to explain the discrepancy between the paleomagnetic evidence and the existence of the craton-sourced sediment in the Nemuro Group. The hypothesis to explain the shallow inclination is the post-depositional shallowing of paleomagnetism (Anson & Kodama, 1987; Blow & Hamilton, 1978; Celaya & Clement, 1988; Jackson et al., 1991). It is known that the inclination of paleomagnetic poles becomes shallower due to post-depositional compaction, indicating a southward latitude than the original location (Celaya & Clement, 1988; Jackson et al., 1991). All paleomagnetic studies in this region have not considered adjusting this effect (Bazhenov & Burtman, 1994; Fujiwara et al., 1995; Katagiri et al., 2019; Nifuku et al., 2009), so future research is necessary to examine this possibility. Another possibility is that the Kuril Arc and the Okhotsk Plate were actually located in the south and have moved slightly north to their present positions. In this case, the dextral slip movement between the central part of Hokkaido and the Paleo-Kuril Arc that occurred from Paleogene to Neogene (described below) becomes difficult to explain. This contradiction may be explained by considering that the dextral slip was not caused by the southward movement of the Kuril Arc but by the northward translation of the Eastern margin of the Eurasian Plate, including NE Japan and Sakhalin. Several paleomagnetic studies implied that the NE Japan Arc might have migrated significantly northward after the Cretaceous (Otofuji et al., 1997; Tamaki et al., 2008).

4.3.2 Paleocene to Early Eocene Period

During the Paleocene to early Eocene, the significant provenance transition of the Paleo-Kuril Arc system occurred together with the two major tectonic events in this region: (1) the subduction of the ridge between the Izanagi and Pacific Plates and (2) the collision between the Eurasian and the Okhotsk Plates (Figure 26b). With this transition of the provenance, clastic particles previously supplied from the continental cratons no longer reached the Paleo-Kuril Arc, and only sediment from the local magmatic arc was deposited in this region after this period.

(1) The subduction of the ridge between Izanagi and Pacific Plates to the eastern margin of the Eurasian Plate was estimated to have occurred along the subduction zone extending from the SW Japan through NE Japan and the central Hokkaido to Sakhalin (Kimura et al., 2019). Seton et al. (2015) inferred that this event occurred during the Paleocene to Early Eocene (60–50 Ma). Based on the unconformity of the forearc basins and geologic records of volcanic activities, Kimura et al. (2019) considered that this subduction occurred earlier in the southern part of the margin, including the SW Japan regions in the Paleocene, while it continued later in the NE Japan and the central Hokkaido until the Eocene. Yamasaki et al. (2021) implied that the subduction of the ridge-transform intersection occurred in central Hokkaido and created magmatism from 46 to 37 Ma based on ages and geochemical data granitic rocks in the Hidaka magmatic zone. Similarly, Maeda (1990) suggested that the Hidaka magmatism event in the central Hokkaido was initiated during 43 to 16 Ma by the subduction event of the Kula-Pacific ridge.

(2) During this period, the collision and the succeeding dextral strike-slip movement between the Okhotsk and Eurasian Plates started. The dextral strike-slip zone extends from central Hokkaido to the Sakhalin region, the boundary between the Okhotsk and the Eurasian Plates (Jolivet, 1992). It has been known that the tectonic belts (i.e., the Tokoro and Nemuro Belts) in the western margin of the Paleo-Kuril Arc were bent clockwise about 90° because of the collision and the dextral strike-slip along the collisional zone (Fujiwara et al., 1995). Katagiri et al. (2019) indicated that the western part of the Urahoro Group in the Nemuro Belt was rotated clockwise at 34° after 40 Ma. Thus, the collision of two continental plates already occurred before the middle Eocene.

During the same period as these two events, the provenances of sediment of the Nemuro Belt complex changed significantly. The Akkeshi (ca. 69 Ma) formation yields the Precambrian

zircons provided from cratons. In contrast, the Shiomi Formation (ca. 52 Ma) yields zircons exhibiting syn-sedimentary ages (ca. 60 Ma). This transition (Figure 25) may have been related to the tectonic events described above. For instance, the collision of the two continental crusts might have caused the uplifting of the crust, which produced the topographic barrier to supply sediment from the inland craton areas. Although regional and tectonic factors differ from the Paleo-Kuril Arc, Isozaki et al. (2010) found that zircon grains of the Precambrian ages significantly decreased at around 90 Ma in the SW Japan Arc. They suggested that this was due to a mountain belt in the central axis of the Arc system created by large-scale igneous activity. They inferred that the mountain belts in the arc system prevented the supply of clastic materials from the continental cratons. A similar process may have occurred in the Paleo-Kuril Arc region. The crustal uplifting, which might be related to the hiatus observed in the Paleo-Kuril Arc in this period, could also be caused by igneous activity due to the Izanagi-Pacific ridge subduction. However, the exact timing and influence of the ridge subduction to the Paleo-Kuril Arc have not been clarified yet.

The opening of the Kuril Basin may be considered a cause of the transition of sediment provenance in the Paleo-Kuril Arc. The age of formation of the Kuril Basin has often been regarded as the same as the Japan Sea (Maeda, 1990). Thus, the expansion of the Kuril Basin has been estimated to have begun during the Miocene (Figure 25) (Maeda, 1990; Schellart et al., 2003). However, this estimate of the timing of the back-arc basin opening lacks solid evidence. No ages were reported from the basement rocks of the Kuril Basin. Maeda (1990) inferred that the dextral slip movement along the two plate boundaries ceased at 17-16 Ma based on the volcanic activity in the Hidaka Belt and speculated that the Kuril Basin was formed around this age. Although this cessation of volcanism implies the end of the expansion of the Basin, there is no evidence that the dextral slip was caused only by the opening of the back-arc basin. Considering that the dextral slip already occurred in the period from Paleocene to early Eocene (Figure 25), it cannot be ruled out that the development of the Kuril Basin began at a very early stage (Figure 25). The coring of filling deposits is necessary to reveal the timing of the development of this back-arc basin.

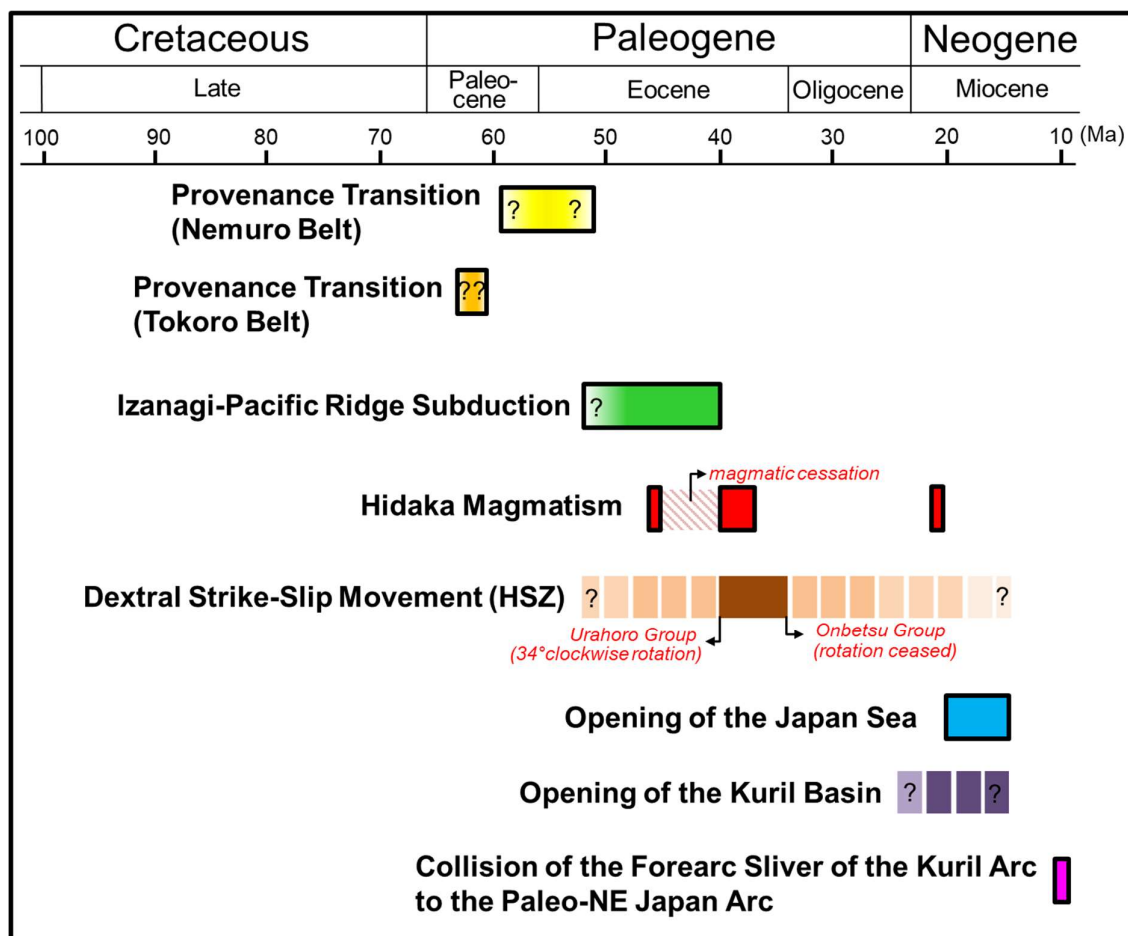


Figure 25. Summary of key geological events in the Nemuro Belt complex. References for the geological event periods: Izanagi-Pacific ridge subduction (Seton et al., 2015); Hidaka magmatism (Yamasaki et al., 2021); Dextral strike-slip movement (Katagiri et al., 2019); Opening of the Japan Sea (Otofuiji, 1996) and (Van Horne et al., 2017); Opening of the Kuril Basin (Maeda, 1990) and (Schellart et al., 2003); Collision of the forearc sliver of the Kuril Arc to the Paleo-NE Japan Arc (Kusunoki & Kimura, 1998). Abbreviation: HSZ = Hidaka Shear Zone; NB = Nemuro Belt; TB = Tokoro Belt.

4.3.3 Middle to Late Eocene Period

In this period, the Paleo-Kuril Arc (and possibly the Okhotsk Plate) had already collided with the eastern margin of the Eurasian Plate (Figure 26c) because the paleomagnetic data of Katagiri et al. (2019) indicated a 34° of clockwise rotation of the terrain before the middle Eocene (40 Ma) (Figure 25), that is, the onset of the deposition of the Urahoro Groups. The bending of the tectonic belts caused this rotation in the Paleo-Kuril Arc, which is associated with the dextral slip between the eastern margin of the Eurasian Plate (i.e., the Paleo-NE Japan

Arc systems in Sakhalin and the central Hokkaido) and the Okhotsk Plate (Fujiwara & Kanamatsu, 1994; Katagiri et al., 2019). The bending of the tectonic belt was estimated to have ceased before the deposition of the Onbetsu Group (ca. 34 Ma) (Figure 25) (Katagiri et al., 2019). However, Kusunoki and Kimura (1998) suggested that the dextral slip movement along the Hidaka Shear Zone continued until the early Miocene (ca. 25 Ma) (Figure 25).

The uniform syn-sedimentary ages of detrital zircons suggest that one of the main sediment provenances of the Nemuro Belt was an active magmatic arc during this period (Figure 25; Figure 26c). However, the abundant occurrence of conglomerates composed of chert gravels in the Urahoro Group (Nanayama et al., 1994) indicates that the uplifted accretionary complex was also the sediment source of the Nemuro Belt. The Tokoro Belt, another tectonic belt in the Paleo-Kuril Arc, is a candidate for the sediment provenance of the Nemuro Belt because it is composed of Cretaceous accretionary complexes containing chert, limestones, and basaltic rocks.

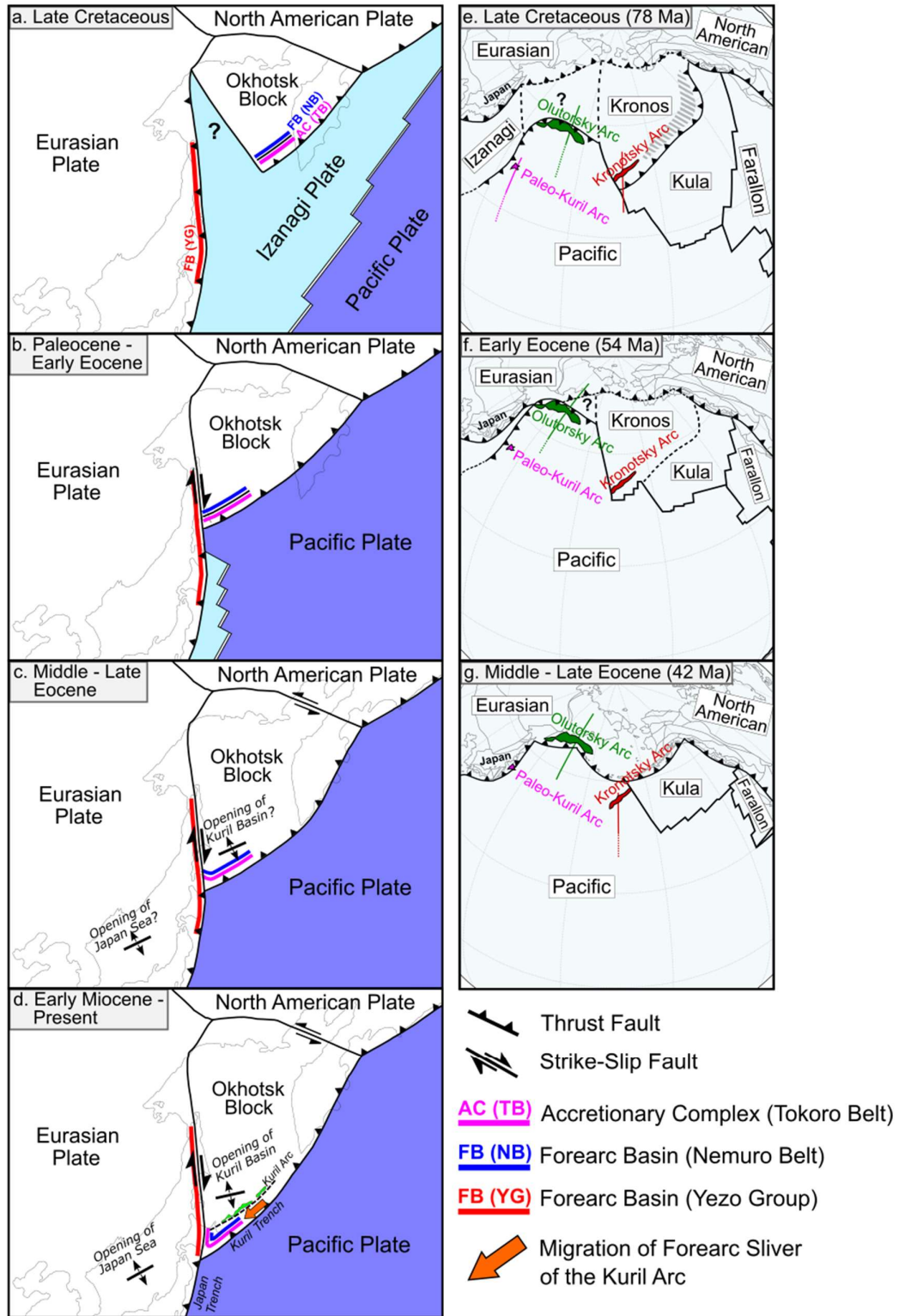


Figure 26. Simplified tectonic model showing the evolution of the Paleo-Kuril Arc in the Okhotsk Plate during the Late Cretaceous to the Present. We compare our propose tectonic model in the figures a to d (modified after Zhao et al., 2018) with tectonic model from Domeier et al. (2017) in the figures e to g.

4.4 Conclusions

1. The sandstones collected from the Nemuro and Tokoro Belts, the Paleo-Kuril Arc, identified two types of age distributions of the detrital zircon grains. Type 1 sandstones exhibit a multimodal age distribution of the detrital zircons with peaks ranging from Cenozoic to Precambrian. The provenances of these Type 1 sandstones are interpreted to be a mixture of both local volcanic sources and continental cratons, which is presumably the Okhotsk Plate. Type 2 signature of detrital zircons is characterized by unimodal distribution with the predominant peaks ranging from 64 to 52 Ma. These Type 2 sandstones of the Paleo-Kuril Arc were probably sourced from volcanic rocks that erupted in the Arc or their recycled sediments.
2. The temporal variation of the U-Pb age distributions of the detrital zircon in the Paleo-Kuril Arc differs largely from that of the adjacent Paleo-Northeast Japan Arc. The zircon grains in sedimentary rock samples of the Sorachi-Yezo Belt are characterized by gradual change in the age distributions, while those obtained in the Nemuro and Tokoro Belts exhibit the instantaneous change from the multimodal to unimodal distributions during the Paleocene. These results indicate that the two adjacent arc-trench systems experienced considerably different tectonic histories.
3. Based on detrital zircon analysis in the Nemuro and Tokoro Belts, this study proposes that the Paleo-Kuril Arc initially developed in the Okhotsk Plate as a continental arc system in the Late Cretaceous and not developed as an intra-oceanic arc between the Izanagi and the Pacific Plates. A provenance transition occurred during the early Paleogene as observed in the sandstone samples from the Nemuro and Tokoro Belts, which both belts were recorded at the same time during the early Paleogene. A collision of the PKA with the Eurasian Plate was recorded in the Middle to Late Eocene which was indicated by clockwise rotation before ~40 Ma, and this event could be associated with dextral slip between the eastern margin of the Eurasian and Okhotsk Plates.

5 Summary

Based on the U-Pb age distributions of the detrital zircon grains, this study revealed that the Paleo-Kuril Arc initially developed as a continental arc system in the Late Cretaceous and did not originate as an intra-oceanic arc system in the Pacific Ocean as suggested by previous studies. Here this dissertation is summarized, and the future directions of research are presented.

5.1 Chapter Summaries

In Chapter 2, a study of detrital zircon U-Pb age distributions in the Nemuro Belt (Nemuro and Urahoro Groups) of the Paleo-Kuril Arc identified two detrital zircon U-Pb type signatures developed in the sandstone samples of the Nemuro Belt. Type 1 signature is characterized by widespread peaks from Precambrian to Cenozoic ages. It can be found in the Late Cretaceous to Paleocene sandstone samples of the Nemuro Group (e.g., Hamanaka, Akkeshi, and Kiritappu Formations). A single peak characterizes the Type 2 signature, dominated mainly by the Cenozoic ages. This type is found in the Paleogene sandstone samples from the Nemuro Group (Shiomi Formation) to the Urahoro Group (Beppo, Harutori, Tenneru, Yuubetsu, and Shitakara Formations). This study also suggests that these different signatures indicate a provenance transition in the Paleo-Kuril Arc from Type 1 (multimodal age distribution) to Type 2 (unimodal age distribution), which can be observed in the uppermost interval of the Nemuro Group between the Kiritappu (62 Ma) and the Shiomi (54 Ma) Formations.

In Chapter 3, the detrital zircon U-Pb age distributions in the Tokoro Belt (Saroma and Yubetsu Groups) of the Paleo-Kuril Arc also implied two U-Pb age signatures developed in the sandstone samples of the Tokoro Belt. Type 1 signature is characterized by widespread peaks (multimodal) from Precambrian to Cenozoic ages. It can be found in the Late Cretaceous sandstones of the Lower and Middle of the Saroma Group and the Kamibaro Unit of the Yubetsu Group. A single peak (unimodal) characterizes the Type 2 signature, which is predominated by the Cenozoic ages. This type is found in the Paleogene sandstones of the Yasukuni and the Mukaiengaru Units of the Yubetsu Group. This study also suggests that these different signatures indicate a provenance transition in the Paleo-Kuril Arc, similar to the

Nemuro Belt. The timing of the provenance transition can be identified between the deposition of the Kamibaro (64 Ma) and Yasukuni (62 Ma) Units of the Yubetsu Group.

In Chapter 4, the sediment provenance of the Paleo-Kuril Arc (PKA) is considered. Type 1 and 2 were compared with the age distributions of the detrital zircon of sandstone samples in other regions. The results suggest that the Type 1 sandstones are derived from the continental cratons in the Okhotsk Plate and the in-situ volcanic arc. Type 2 sandstones occurred in the Paleogene, and the primary source of the sediment in this period was the volcanic arc. A comparison of the temporal variation in the age distribution of the zircon grains shows that the PKA and the adjacent NE Japan Arc have had quite different tectonic histories. Based on the comparison of the zircon ages and the paleomagnetic data from the existing studies, the PKA developed as the continental arc along the margin of the Okhotsk Plate during the Late Cretaceous. Later, around the Paleocene, the PKA collided obliquely with NE Japan and started to move southward while bending. The PKA lost its link with the continental crust by Eocene, which could be related to the expansion of the Kuril Basin. Although the tectonic bending of the PKA ceased by the Oligocene, its southward movement continued after that. The plate configuration became the same as the present day, probably in the Miocene.

This study supports the hypothesis that the ridge subduction occurred due to the subduction of the Izanagi Plate, as proposed by Seton et al. (2015). The subsidence of the plate boundary did not develop trench subduction as proposed by Domeier et al. (2017) because the Late Cretaceous sandstones in PKA contained the Precambrian zircons commonly.

5.2 Future Research Directions

This study proposes four recommendations for the future research directions in Paleo-Kuril Arc (Nemuro and Tokoro Belts) as follows:

1. Additional detrital zircon U-Pb data, particularly in the Yubetsu Group of the Tokoro Belt, to get the complete results of the sediment provenance analysis for the Tokoro Belt as already obtained in the Nemuro Belt from this study.
2. The biostratigraphic analysis is still needed, especially for the samples from the Yubetsu Group. This recommendation is important because previous studies suggested a lack of index fossils for age determination.

3. The paleomagnetic data of the Paleo-Kuril Arc is still an enigma, despite numerous previous studies that have been conducted. Even though much evidence indicates that PKA moved south relative to the Northeast Japan Arc, there is no clear answer to whether the paleomagnetic data derived from sedimentary rocks indicates the same latitude as present or south. A more comprehensive analysis of the paleomagnetic data is still required, particularly in the Nemuro and Tokoro Belts region.
4. Geophysical and marine geological data are required to integrate the tectonic history of the origin of the Paleo-Kuril Arc. Especially, the timing of the development of the Kuril Basin needs to be clarified.

APPENDIXES:

Appendix A: Outcrop Stations in the Nemuro and Tokoro Belts

Appendix B: U-Pb Detrital Zircon Data of the Nemuro Belt

Appendix C: U-Pb Detrital Zircon Data of the Tokoro Belt

Appendix A: Outcrop Stations in the Nemuro and Tokoro Belts

Station	Strata (Fm./Un.)	Group	Sample Code	Coordinate		Location	Sample Type	DZ U-Pb Analysis
				Longitude	Latitude			
ST.1	Akkeshi Fm.	Nemuro	ST1AK4	145°07'41.56"	43°08'07.40"	Hamanaka	Sandstone	√
ST.2	Akkeshi Fm.	Nemuro	ST2AK3	145°08'14.28"	43°08'24.32"	Hamanaka	Sandstone	√
ST.3	Hamanaka Fm.	Nemuro	ST3HM4	145°13'09.08"	43°08'20.47"	Hamanaka	Sandstone	√
ST.4	Shiomi Fm.	Nemuro	ST4SH2	144°28'19.16"	42°56'49.92"	Akkeshi Bay	Sandstone	√
ST.5	Harutori Fm.	Uraho	ST5HR1	144°28'00.01"	42°56'41.57"	Akkeshi Bay	Sandstone	√
ST.6	Tenneru Fm.	Uraho	ST6TN1	144°28'37.99"	42°56'34.33"	Akkeshi Bay	Sandstone	√
ST.7	Beppo Fm.	Uraho	ST7BP4	144°27'51.95"	42°56'55.36"	Akkeshi Bay	Sandstone	√
ST.8	Yuubetsu Fm.	Uraho	ST8YU	144°29'25.58"	42°56'34.98"	Akkeshi Bay	Sandstone	-
ST.9	Shitakara Fm.	Uraho	ST9ST1	144°29'33.61"	42°56'48.81"	Akkeshi Bay	Sandstone	√
ST.10	Yuubetsu Fm.	Uraho	ST10YU5	144°27'03.13"	42°56'42.22"	Akkeshi Bay	Sandstone	√
ST.11	Yuubetsu Fm.	Uraho	ST11YU4	144°03'48.06"	43°12'59.91"	Shiranuka-hill	Sandstone	√
ST.12	Shiomi Fm.	Nemuro	ST12SH	144°37'00.03"	42°57'06.21"	Akkeshi Bay	Sandstone	-
ST.13	Nokkamappu Fm.	Nemuro	ST13NKP1	145°38'19.09"	43°22'29.89"	Nemuro	Sandstone	N/A ^{*)}
ST.14	Tokotan Fm.	Nemuro	ST14TK5	145°31'04.05"	43°11'14.35"	Nemuro	Sandstone	-
ST.15	Kiritappu Fm.	Nemuro	ST15KR5	145°08'26.96"	43°04'51.94"	Hamanaka Bay	Sandstone	√
ST.16	Upper Saroma	Saroma	ST16USR2	143°55'19.69"	44°04'06.29"	Saroma	Mudstone	N/A ^{*)}
ST.17	Middle Saroma	Saroma	ST17MSR1	143°54'46.75"	44°04'08.34"	Saroma	Sandstone	√
ST.18	Lower Saroma	Saroma	ST18LSR5	143°54'35.12"	44°04'11.88"	Saroma	Sandstone	√
ST.19	Lower Saroma	Saroma	ST19LSR3	143°53'57.03"	44°04'24.33"	Saroma	Sandstone	-
ST.20	Yasukuni Unit	Yubetsu	ST20YSK1	143°35'48.49"	44°03'57.82"	Saroma	Sandstone	√
ST.21	Asahino Unit	Yubetsu	ST21ASH	143°37'39.89"	44°04'52.60"	Saroma	Sandstone	-
ST.22	Kamibaro Unit	Yubetsu	ST22KMB5	143°39'22.84"	44°06'43.69"	Saroma	Sandstone	√

ST.23	Mizuho Unit	Yubetsu	ST23MZH2	143°41'39.72''	44°08'24.25''	Saroma	Sandstone	-
ST.24	Mukaiengaru Unit	Yubetsu	ST24MG2	143°32'27.54''	44°05'37.43''	Engaru	Sandstone	√
ST.25	Toyosato Unit	Yubetsu	ST25TYT	143°32'33.43''	44°02'14.07''	Saroma	Sandstone	-
ST.26	Onari Unit	Yubetsu	ST26ONR	143°40'56.27''	44°03'51.71''	Saroma	Mudstone	-
ST.27	Nikoro Group	Nikoro	ST27NK	143°50'47.07''	44°02'06.73''	Saroma	Chert & Limestone	-
ST.28	Nikoro Group	Nikoro	ST28NK	143°50'01.34''	44°03'51.07''	Saroma	Mudstone	-

Notes: Only 16 sandstone samples were identified for U-Pb ages from stations 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 15, 17, 18, 20, 22, and 24.

*) Identification of zircon grains in the stations 13 (Nokkamappu Fm.) and 16 (Upper Saroma) were showing no zircon existed.

Abbreviation: DZ = Detrital Zircon; Fm = Formation; N/A = Not Available; ST = Station; Un = Unit

Appendix B: U-Pb Detrital Zircon Data of the Nemuro Belt

B.1 Shitakara Formation (ST9ST1)

U-Pb LA-ICP-MS Detrital Zircon Data of Shitakara Formation

Sample Location: Station-9, Akkeshi Bay Area, Eastern Hokkaido, Japan

Formation / Group: Shitakara Formation / Urahoro Group

Belt: Nemuro Belt

Sample Type: Sandstone (medium - coarse sandstone)

Grain Number	Th (PPM)	U (PPM)	Th /U	Isotopic Ratios							U-Pb Age (Ma)								U-Pb Age (Ma)								Preferr ed Age	± 2σ	Disc. (%)
											before Stacey-Kramers Correction				after Stacey-Kramers Correction														
				207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	Error Corr.	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ							
ST9ST1-1	80	176	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.34	39.5	654.3	54.2	4.9	55.2	14.2	54.1	301.7	54.1	2.4	54.1	7.1	54.1	2.4	0.0	(Ce)			
ST9ST1-2	76	101	0.8	0.07	0.02	0.01	0.00	0.08	0.02	0.39	854.0	609.4	55.1	5.9	80.0	21.5	53.5	451.7	53.5	2.8	53.5	10.2	53.5	2.8	- 0.1	(Ce)			
ST9ST1-3	110	281	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.44	210.2	433.2	58.2	4.6	63.6	10.9	57.9	207.8	57.9	2.3	57.9	5.4	57.9	2.3	0.0	(Ce)			
ST9ST1-5	156	165	0.9	0.07	0.02	0.01	0.00	0.08	0.02	0.45	952.5	444.3	50.1	4.6	76.5	15.1	48.5	337.1	48.5	2.2	48.5	7.0	48.5	2.2	0.0	(Ce)			
ST9ST1-6	54	129	0.4	0.04	0.02	0.01	0.00	0.04	0.02	0.27	-130.1	964.3	44.6	4.6	42.6	15.9	44.6	417.2	44.6	2.3	44.6	8.0	44.6	2.3	0.0	(Ce)			
ST9ST1-7	80	196	0.4	0.06	0.01	0.01	0.00	0.06	0.01	0.41	434.5	494.6	52.3	4.5	63.0	12.9	51.6	278.1	51.6	2.2	51.6	6.3	51.6	2.2	0.0	(Ce)			
ST9ST1-8	155	327	0.5	0.06	0.01	0.01	0.00	0.07	0.01	0.51	586.0	345.2	54.4	4.1	70.0	10.1	53.4	199.0	53.5	2.0	53.5	4.8	53.5	2.0	0.0	(Ce)			
ST9ST1-9	207	288	0.7	0.05	0.01	0.01	0.00	0.06	0.01	0.46	239.6	412.7	55.2	4.3	61.1	10.1	54.8	199.9	54.8	2.1	54.8	4.9	54.8	2.1	0.0	(Ce)			
ST9ST1-10	49	318	0.2	0.05	0.01	0.03	0.00	0.19	0.02	0.65	128.6	250.6	173.4	11.1	174.5	15.9	173.3	88.1	173.3	5.5	173.3	7.9	173.3	5.5	0.0	(Ce)			
ST9ST1-11	223	395	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.50	115.5	363.7	53.8	3.9	56.6	8.0	53.7	158.2	53.7	1.9	53.7	4.0	53.7	1.9	0.0	(Ce)			
ST9ST1-12	150	224	0.7	0.06	0.01	0.01	0.00	0.07	0.01	0.46	514.4	412.9	56.9	4.6	70.8	12.2	56.1	236.2	56.1	2.2	56.1	5.8	56.1	2.2	0.0	(Ce)			
ST9ST1-13	227	395	0.6	0.06	0.01	0.01	0.00	0.06	0.01	0.52	612.7	326.8	48.2	3.5	63.0	8.7	47.3	190.6	47.3	1.7	47.3	4.1	47.3	1.7	0.0	(Ce)			
OD3	431	389	1.1	0.10	0.02	0.01	0.00	0.07	0.01	0.54	1604.8	327.6	33.2	2.9	70.9	11.0	30.9	353.6	30.9	1.3	30.9	4.7	30.9	1.3	0.0	(Ce)			
GJ1	18	341	0.1	0.06	0.00	0.10	0.01	0.87	0.06	0.92	667.6	157.6	610.9	35.6	635.2	31.2	608.6	28.9	608.6	17.7	608.6	15.2	608.6	17.7	0.0	(Ce)			
NIST	26	71	0.4	0.07	0.01	0.19	0.01	1.92	0.16	0.82	976.4	178.4	1115.6	69.7	1086.5	55.4	1120.2	45.3	1120.2	35.1	1120.2	27.8	1120.2	45.3	0.0	(Ce)			
NIST	26	73	0.4	0.07	0.01	0.18	0.01	1.80	0.15	0.82	950.7	177.4	1066.2	66.3	1045.7	53.4	1069.2	45.1	1069.2	33.3	1069.2	26.8	1069.2	45.1	0.0	(Ce)			
NIST	25	69	0.4	0.08	0.01	0.18	0.01	1.93	0.16	0.84	1103.0	171.4	1061.0	66.1	1092.0	54.1	1056.6	46.9	1056.6	32.8	1056.6	26.9	1056.6	46.9	0.0	(Ce)			
91500	25	72	0.3	0.08	0.01	0.18	0.01	1.87	0.16	0.81	1072.8	179.0	1042.4	66.1	1069.2	55.9	1038.6	51.8	1038.6	32.8	1038.6	27.8	1038.6	51.8	0.0	(Ce)			

91500	26	76	0.3	0.07	0.01	0.17	0.01	1.84	0.15	0.82	1062.9	177.9	1034.3	65.3	1060.4	55.1	1030.7	50.9	1030.7	32.4	1030.7	27.4	1030.7	50.9	0.0	(Ce)
91500	26	77	0.3	0.07	0.01	0.18	0.01	1.85	0.16	0.81	1022.9	179.9	1058.5	66.9	1063.9	55.6	1057.8	49.8	1057.8	33.4	1057.8	27.8	1057.8	49.8	0.0	(Ce)
ST9ST1-14	144	282	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.36	281.5	410.5	55.3	3.4	61.2	10.1	54.9	210.6	54.9	1.7	54.9	5.0	54.9	1.7	0.0	(Ce)
ST9ST1-15	155	237	0.7	0.05	0.01	0.01	0.00	0.06	0.01	0.35	278.9	445.8	56.2	3.6	62.1	11.2	55.8	229.8	55.8	1.8	55.8	5.5	55.8	1.8	0.0	(Ce)
ST9ST1-16	2416	1649	1.5	0.06	0.00	0.01	0.00	0.07	0.00	0.59	507.1	154.0	55.1	2.0	67.3	4.0	54.4	72.9	54.4	1.0	54.4	1.9	54.4	1.0	0.0	(Ce)
ST9ST1-18	34	124	0.3	0.05	0.02	0.01	0.00	0.07	0.02	0.30	341.7	645.6	61.8	5.1	70.0	18.6	61.3	355.0	61.3	2.5	61.3	9.2	61.3	2.5	0.0	(Ce)
ST9ST1-20	67	117	0.6	0.05	0.02	0.01	0.00	0.06	0.02	0.28	50.4	782.9	55.2	4.9	55.5	17.1	55.2	365.0	55.2	2.5	55.2	8.6	55.2	2.5	0.0	(Ce)
ST9ST1-21	393	312	1.3	0.06	0.01	0.01	0.00	0.06	0.01	0.39	621.0	355.6	49.5	3.0	63.7	9.6	48.6	220.9	48.6	1.4	48.6	4.6	48.6	1.4	0.0	(Ce)
ST9ST1-22	43	92	0.5	0.05	0.02	0.01	0.00	0.06	0.02	0.27	332.3	881.1	53.0	5.3	60.0	22.0	52.5	492.9	52.5	2.6	52.5	10.9	52.5	2.6	-0.1	(Ce)
ST9ST1-23	105	176	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.33	381.9	547.2	52.0	4.0	60.2	13.6	51.5	304.5	51.5	2.0	51.5	6.7	51.5	2.0	0.0	(Ce)
ST9ST1-24	195	159	1.2	0.05	0.01	0.03	0.00	0.17	0.02	0.40	61.0	339.0	164.0	8.6	158.7	19.8	165.0	140.0	164.8	4.4	164.8	10.0	164.8	4.4	0.0	(Ce)
ST9ST1-25	49	90	0.5	0.06	0.02	0.01	0.00	0.08	0.02	0.32	574.8	666.5	61.1	5.7	76.6	21.7	60.1	418.8	60.1	2.8	60.1	10.6	60.1	2.8	0.0	(Ce)
ST9ST1-26	424	617	0.7	0.05	0.01	0.01	0.00	0.08	0.01	0.46	408.2	231.4	70.4	3.1	81.7	7.5	69.7	117.7	69.7	1.5	69.7	3.6	69.7	1.5	0.0	(Ce)
OD3	568	466	1.2	0.06	0.01	0.01	0.00	0.05	0.01	0.39	752.8	356.6	35.6	2.2	49.1	7.6	34.8	241.6	34.8	1.1	34.8	3.6	34.8	1.1	0.0	(Ce)
GJ1	15	327	0.0	0.06	0.00	0.10	0.00	0.77	0.03	0.79	505.8	114.4	593.3	19.6	579.0	19.3	594.9	28.2	594.9	9.9	594.9	9.8	594.9	9.9	0.0	(Ce)
NIST	25	71	0.4	0.08	0.01	0.18	0.01	1.88	0.13	0.69	1101.8	143.3	1051.3	45.5	1073.1	44.9	1048.3	51.1	1048.3	22.6	1048.3	22.5	1048.3	51.1	0.0	(Ce)
NIST	26	75	0.3	0.08	0.01	0.18	0.01	1.85	0.12	0.69	1091.9	141.9	1043.2	44.7	1064.2	44.1	1040.3	50.2	1040.3	22.2	1040.3	22.1	1040.3	50.2	0.0	(Ce)
NIST	26	76	0.3	0.07	0.01	0.18	0.01	1.86	0.13	0.69	1052.1	143.8	1067.6	45.8	1067.7	44.6	1067.6	49.2	1067.6	22.9	1067.6	22.3	1067.6	49.2	0.0	(Ce)
91500	25	70	0.4	0.07	0.01	0.18	0.01	1.89	0.12	0.70	1055.1	140.8	1078.4	45.8	1075.9	43.8	1078.7	47.1	1078.7	22.9	1078.7	21.9	1078.7	47.1	0.0	(Ce)
91500	25	68	0.4	0.07	0.01	0.18	0.01	1.86	0.12	0.69	1031.0	142.6	1078.3	45.9	1068.0	44.1	1079.8	47.5	1079.8	23.0	1079.8	22.0	1079.8	47.5	0.0	(Ce)
91500	26	71	0.4	0.08	0.01	0.18	0.01	1.87	0.12	0.70	1074.8	140.0	1059.3	45.0	1069.5	43.5	1057.8	48.0	1057.8	22.4	1057.8	21.8	1057.8	48.0	0.0	(Ce)
ST9ST1-27	198	247	0.8	0.06	0.01	0.01	0.00	0.07	0.01	0.40	522.8	387.7	56.4	4.2	70.8	13.0	55.6	263.0	55.6	2.1	55.6	6.3	55.6	2.1	0.0	(Ce)
ST9ST1-28	74	130	0.6	0.05	0.01	0.01	0.00	0.06	0.02	0.35	335.1	600.9	53.4	5.0	61.8	16.1	52.9	350.3	52.9	2.4	52.9	7.9	52.9	2.4	0.0	(Ce)
ST9ST1-29	252	375	0.7	0.05	0.01	0.01	0.00	0.07	0.01	0.39	269.9	333.8	59.4	3.9	66.7	10.7	59.0	204.1	59.0	1.9	59.0	5.3	59.0	1.9	0.0	(Ce)
ST9ST1-30	87	554	0.2	0.06	0.01	0.01	0.00	0.08	0.01	0.44	744.1	257.5	58.6	3.7	81.1	11.3	57.2	217.9	57.2	1.8	57.2	5.4	57.2	1.8	0.0	(Ce)
ST9ST1-31	145	214	0.7	0.07	0.01	0.01	0.00	0.08	0.02	0.42	976.2	359.2	53.2	4.1	82.2	14.9	51.4	321.3	51.4	1.9	51.4	7.0	51.4	1.9	0.0	(Ce)
ST9ST1-32	103	168	0.6	0.05	0.01	0.01	0.00	0.06	0.02	0.33	259.1	583.1	52.9	4.6	59.3	15.0	52.5	329.2	52.5	2.3	52.5	7.4	52.5	2.3	0.0	(Ce)
ST9ST1-33	147	230	0.6	0.04	0.01	0.01	0.00	0.06	0.01	0.34	-66.8	518.9	57.1	4.3	55.9	12.2	58.0	245.1	58.0	2.2	58.0	6.2	58.0	2.2	0.0	(Ce)
ST9ST1-34	133	292	0.5	0.07	0.01	0.01	0.00	0.08	0.01	0.42	851.9	315.3	55.5	3.9	80.8	13.1	53.9	269.0	53.9	1.9	53.9	6.2	53.9	1.9	0.0	(Ce)
ST9ST1-35	128	229	0.6	0.06	0.01	0.01	0.00	0.08	0.02	0.38	697.3	406.1	57.2	4.4	77.5	15.1	56.0	305.7	56.0	2.1	56.0	7.3	56.0	2.1	0.0	(Ce)

ST9ST1-36	116	176	0.7	0.06	0.01	0.01	0.00	0.06	0.01	0.35	430.5	540.4	48.4	4.2	58.5	14.2	47.8	339.2	47.8	2.0	47.8	6.9	47.8	2.0	0.0	(Cc)
ST9ST1-38	44	225	0.2	0.06	0.01	0.01	0.00	0.06	0.01	0.38	564.3	462.4	47.8	4.0	61.3	13.1	46.9	314.8	46.9	1.9	46.9	6.3	46.9	1.9	0.0	(Cc)
ST9ST1-39	448	734	0.6	0.05	0.01	0.01	0.00	0.05	0.01	0.43	315.3	272.5	43.3	2.7	50.0	7.0	42.9	180.8	42.9	1.3	42.9	3.4	<u>42.9*</u>	<u>1.3*</u>	0.0	(Cc)
OD3	689	595	1.2	0.07	0.01	0.01	0.00	0.06	0.01	0.44	900.2	290.3	39.3	2.7	59.1	9.1	38.0	260.7	38.0	1.3	38.0	4.3	38.0	1.3	0.0	(Cc)
GJ1	17	339	0.1	0.06	0.00	0.10	0.01	0.81	0.08	0.52	601.9	106.7	586.7	29.6	603.2	45.8	585.2	96.7	585.2	14.7	585.2	23.0	585.2	14.7	0.0	(Cc)
NIST	25	71	0.4	0.07	0.00	0.18	0.01	1.94	0.22	0.54	1056.1	132.7	1083.5	60.3	1094.1	74.4	1082.0	95.0	1082.0	30.1	1082.0	37.4	1082.0	95.0	0.0	(Cc)
NIST	25	70	0.4	0.07	0.00	0.18	0.01	1.91	0.21	0.54	1032.0	134.5	1083.4	60.3	1086.1	74.3	1083.0	94.3	1083.0	30.1	1083.0	37.2	1083.0	94.3	0.0	(Cc)
NIST	26	72	0.4	0.08	0.00	0.18	0.01	1.92	0.21	0.54	1075.7	132.0	1064.3	59.2	1087.7	74.0	1061.0	97.1	1061.0	29.4	1061.0	37.4	1061.0	97.1	0.0	(Cc)
91500	25	71	0.4	0.07	0.01	0.17	0.01	1.82	0.21	0.54	1064.0	150.4	1018.5	59.3	1052.4	76.3	1014.0	105.0	1013.9	29.4	1013.9	38.8	1014.0	105.0	0.0	(Cc)
91500	24	69	0.4	0.07	0.01	0.18	0.01	1.72	0.20	0.53	861.3	162.9	1058.8	62.0	1015.2	76.5	1065.8	94.5	1065.8	31.4	1065.8	37.5	1065.8	94.5	0.0	(Cc)
91500	25	70	0.4	0.07	0.01	0.18	0.01	1.90	0.22	0.54	1044.2	145.9	1069.5	61.3	1080.8	76.6	1067.9	99.0	1067.9	30.6	1067.9	38.5	1067.9	99.0	0.0	(Cc)
ST9ST1-40	503	1666	0.3	0.06	0.01	0.01	0.00	0.10	0.01	0.48	503.9	243.4	76.5	4.7	93.6	11.7	75.4	168.2	75.4	2.3	75.4	5.6	75.4	2.3	0.0	(Cc)
ST9ST1-41	89	150	0.6	0.09	0.02	0.01	0.00	0.13	0.02	0.46	1506.5	350.6	61.9	5.4	122.2	21.8	58.1	407.6	58.1	2.4	58.1	9.9	58.1	2.4	0.0	(Cc)
ST9ST1-42	79	1004	0.1	0.05	0.01	0.01	0.00	0.06	0.01	0.47	220.0	248.6	54.1	3.3	59.2	7.4	53.8	148.3	53.8	1.6	53.8	3.6	53.8	1.6	0.0	(Cc)
ST9ST1-43	321	396	0.8	0.05	0.01	0.01	0.00	0.06	0.01	0.40	213.3	383.4	54.3	3.8	59.3	10.2	54.0	211.2	54.0	1.9	54.0	5.0	54.0	1.9	0.0	(Cc)
ST9ST1-45	182	252	0.7	0.06	0.01	0.01	0.00	0.06	0.01	0.39	554.4	449.9	48.0	3.9	60.9	12.5	47.2	297.9	47.2	1.9	47.2	6.0	47.2	1.9	0.0	(Cc)
ST9ST1-46	61	109	0.6	0.23	0.04	0.01	0.00	0.48	0.07	0.65	3066.9	241.8	93.9	9.2	398.4	49.9	71.5	682.1	71.5	2.7	71.5	20.0	71.5	2.7	0.0	(Cc)
ST9ST1-48	523	901	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.46	244.7	263.3	50.9	3.1	56.4	7.3	50.5	157.5	50.5	1.5	50.5	3.6	50.5	1.5	0.0	(Cc)
ST9ST1-49	332	858	0.4	0.05	0.01	0.01	0.00	0.07	0.01	0.47	191.3	243.9	67.0	4.0	72.1	8.8	66.7	143.0	66.7	2.0	66.7	4.3	66.7	2.0	0.0	(Cc)
ST9ST1-50	172	220	0.8	0.06	0.01	0.01	0.00	0.07	0.02	0.39	599.4	461.2	52.4	4.4	67.7	14.3	51.5	312.2	51.5	2.1	51.5	6.9	51.5	2.1	0.0	(Cc)
ST9ST1-51	231	399	0.6	0.05	0.01	0.01	0.00	0.07	0.01	0.41	354.1	355.6	55.4	3.9	64.2	10.5	54.8	213.8	54.8	1.9	54.8	5.1	54.8	1.9	0.0	(Cc)
ST9ST1-52	156	244	0.6	0.06	0.01	0.01	0.00	0.09	0.02	0.41	440.6	384.4	75.8	5.6	90.3	15.8	74.9	237.8	74.9	2.7	74.9	7.7	74.9	2.7	0.0	(Cc)
OD3	161	178	0.9	0.08	0.03	0.01	0.00	0.06	0.02	0.38	1296.0	611.6	33.6	4.0	61.1	18.2	31.9	626.8	31.9	1.8	31.9	8.4	31.9	1.8	0.0	(Cc)
GJ1	18	348	0.1	0.06	0.00	0.09	0.01	0.80	0.08	0.56	588.7	147.6	584.0	31.4	595.2	45.7	582.9	93.9	582.9	15.6	582.9	22.9	582.9	15.6	0.0	(Cc)
NIST	25	73	0.4	0.08	0.01	0.17	0.01	1.83	0.22	0.56	1077.3	178.3	1025.9	62.8	1057.5	77.2	1022.0	103.0	1021.6	31.1	1021.6	39.1	1022.0	103.0	0.0	(Cc)
NIST	25	70	0.4	0.07	0.01	0.18	0.01	1.73	0.21	0.56	875.0	190.6	1066.5	65.5	1020.2	77.3	1074.0	93.1	1074.0	33.2	1074.0	37.9	1074.0	93.1	0.0	(Cc)
NIST	26	72	0.4	0.07	0.01	0.18	0.01	1.91	0.22	0.56	1057.5	174.8	1077.2	65.0	1086.0	77.4	1076.0	97.5	1076.0	32.4	1076.0	38.9	1076.0	97.5	0.0	(Cc)
91500	26	73	0.4	0.07	0.01	0.18	0.01	1.83	0.21	0.56	1032.0	171.3	1048.2	62.4	1058.0	75.2	1046.9	96.7	1046.9	31.1	1046.9	37.7	1046.9	96.7	0.0	(Cc)
91500	25	72	0.3	0.08	0.01	0.18	0.01	1.92	0.22	0.57	1107.2	168.1	1058.0	63.1	1089.5	76.1	1053.6	99.3	1053.6	31.3	1053.6	38.6	1053.6	99.3	0.0	(Cc)
91500	23	68	0.3	0.07	0.01	0.19	0.01	1.97	0.22	0.57	1064.7	169.5	1102.1	65.8	1105.0	76.9	1101.7	94.4	1101.7	32.9	1101.7	38.5	1101.7	94.4	0.0	(Cc)
ST9ST1-54	153	188	0.8	0.06	0.01	0.01	0.00	0.07	0.02	0.38	612.3	468.4	56.8	4.6	71.4	14.6	55.9	294.1	55.9	2.2	55.9	7.1	55.9	2.2	0.0	(Cc)

ST9ST1-56	120	439	0.3	0.05	0.01	0.01	0.00	0.07	0.01	0.43	284.9	341.9	61.0	3.9	66.3	9.6	60.7	174.6	60.7	1.9	60.7	4.7	60.7	1.9	0.0	(Cc)
ST9ST1-58	124	225	0.6	0.05	0.01	0.01	0.00	0.07	0.01	0.39	280.0	448.3	61.2	4.6	66.4	12.3	60.9	228.8	60.9	2.3	60.9	6.1	60.9	2.3	0.0	(Cc)
ST9ST1-59	159	276	0.6	0.06	0.01	0.01	0.00	0.06	0.01	0.41	678.2	397.1	47.6	3.5	61.9	10.9	46.8	259.1	46.8	1.7	46.8	5.2	46.8	1.7	0.0	(Cc)
ST9ST1-60	31698	16741	1.9	0.05	0.00	0.01	0.00	0.06	0.00	0.63	323.7	156.9	55.2	2.7	61.2	4.6	54.9	79.8	54.9	1.3	54.9	2.2	54.9	1.3	0.0	(Cc)
ST9ST1-62	47	121	0.4	0.06	0.02	0.01	0.00	0.08	0.02	0.34	763.4	617.8	55.0	5.3	74.1	20.3	53.9	433.3	53.9	2.6	53.9	9.9	53.9	2.6	0.0	(Cc)
ST9ST1-63	87	229	0.4	0.05	0.01	0.01	0.00	0.07	0.01	0.37	22.6	473.2	69.8	5.0	67.8	12.8	69.8	208.5	69.8	2.5	69.8	6.4	69.8	2.5	0.0	(Cc)
ST9ST1-64	165	306	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.41	174.9	400.9	63.2	4.3	65.5	10.8	63.1	191.7	63.1	2.2	63.1	5.4	63.1	2.2	0.0	(Cc)
ST9ST1-65	196	553	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.44	199.4	329.2	55.6	3.4	58.4	8.0	55.4	159.7	55.4	1.7	55.4	4.0	55.4	1.7	0.0	(Cc)
OD3	294	309	0.9	0.06	0.01	0.01	0.00	0.04	0.01	0.36	549.2	548.0	36.1	3.1	44.5	10.6	35.5	337.7	35.6	1.5	35.6	5.2	35.6	1.5	0.0	(Cc)
GJ1	18	335	0.1	0.06	0.00	0.10	0.01	0.84	0.07	0.60	625.3	170.5	626.4	31.1	621.3	40.2	626.9	73.7	626.9	15.6	626.9	20.1	626.9	15.6	0.0	(Cc)
NIST	26	74	0.4	0.07	0.01	0.18	0.01	1.77	0.18	0.60	1029.8	189.9	1046.2	58.8	1034.2	65.9	1047.9	80.3	1047.9	29.5	1047.9	32.8	1047.9	80.3	0.0	(Cc)
NIST	26	73	0.3	0.08	0.01	0.18	0.01	1.86	0.19	0.60	1105.0	186.6	1055.9	59.4	1065.2	66.7	1054.6	82.3	1054.6	29.6	1054.6	33.4	1054.6	82.3	0.0	(Cc)
NIST	23	69	0.3	0.07	0.01	0.19	0.01	1.90	0.19	0.60	1062.5	188.1	1099.9	62.0	1080.5	67.4	1102.9	78.3	1102.9	31.2	1102.9	33.5	1102.9	78.3	0.0	(Cc)
91500	26	74	0.4	0.08	0.01	0.18	0.01	1.98	0.20	0.61	1175.6	181.8	1084.8	60.8	1108.4	67.3	1081.4	82.2	1081.4	30.2	1081.4	33.9	1081.4	82.2	0.0	(Cc)
91500	25	74	0.3	0.08	0.01	0.18	0.01	1.87	0.19	0.61	1150.8	183.3	1041.7	58.3	1070.7	66.1	1037.7	84.0	1037.7	29.0	1037.7	33.4	1037.7	84.0	0.0	(Cc)
91500	26	73	0.4	0.08	0.01	0.18	0.01	1.83	0.18	0.60	1096.0	185.5	1049.6	58.7	1058.0	66.0	1048.4	81.7	1048.4	29.3	1048.4	33.1	1048.4	81.7	0.0	(Cc)
ST9ST1-66	124	182	0.7	0.06	0.01	0.01	0.00	0.07	0.01	0.35	501.6	476.3	54.7	4.1	66.2	14.0	54.0	298.3	54.0	2.0	54.0	6.9	54.0	2.0	0.0	(Cc)
ST9ST1-68	35	72	0.5	0.69	0.04	0.07	0.00	6.52	0.61	0.58	4717.8	92.8	424.4	22.2	2049.2	82.1	79.8	1317.5	79.8	0.4	79.8	42.6	79.8	0.4	0.0	(Cc)
ST9ST1-69	198	481	0.4	0.09	0.01	0.01	0.00	0.11	0.01	0.42	1437.7	202.8	56.9	2.9	106.9	12.5	53.8	256.5	53.8	1.3	53.8	5.8	53.8	1.3	0.0	(Cc)
ST9ST1-70	1110	999	1.1	0.05	0.01	0.01	0.00	0.07	0.01	0.37	318.6	218.6	60.8	2.7	67.8	7.7	60.4	144.9	60.4	1.3	60.4	3.8	60.4	1.3	0.0	(Cc)
ST9ST1-71	143	302	0.5	0.05	0.01	0.02	0.00	0.14	0.02	0.37	231.5	272.8	126.2	6.2	131.9	16.7	126.0	155.0	125.8	3.1	125.8	8.3	125.8	3.1	0.0	(Cc)
ST9ST1-73	253	355	0.7	0.06	0.01	0.01	0.00	0.07	0.01	0.37	687.8	329.9	49.8	3.0	65.7	10.4	48.8	242.5	48.8	1.4	48.8	5.0	48.8	1.4	0.0	(Cc)
ST9ST1-74	60	141	0.4	0.39	0.03	0.02	0.00	0.92	0.09	0.61	3884.1	131.0	108.2	6.7	662.4	50.0	61.0	810.6	61.0	1.1	61.0	20.2	61.0	1.1	0.0	(Cc)
ST9ST1-75	159	279	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.32	82.5	443.8	56.5	3.5	57.2	10.8	56.5	222.2	56.5	1.8	56.5	5.4	56.5	1.8	0.0	(Cc)
ST9ST1-77	576	905	0.6	0.09	0.01	0.01	0.00	0.10	0.01	0.42	1398.5	164.2	51.8	2.3	95.9	9.9	49.1	222.3	49.1	1.0	49.1	4.6	49.1	1.0	0.0	(Cc)
ST9ST1-78	125	252	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.33	192.3	447.4	57.0	3.7	60.4	11.6	56.8	237.8	56.8	1.8	56.8	5.8	56.8	1.8	0.0	(Cc)
OD3	94	135	0.7	0.63	0.06	0.02	0.00	2.00	0.20	0.69	4586.3	126.5	145.7	10.0	1115.8	68.3	37.7	1192.0	37.7	0.3	37.7	18.4	37.7	0.3	0.0	(Cc)
GJ1	19	365	0.1	0.06	0.00	0.10	0.00	0.79	0.08	0.41	575.6	144.0	596.2	22.7	593.0	43.6	596.5	95.1	596.5	11.4	596.5	21.8	596.5	11.4	0.0	(Cc)
NIST	26	74	0.4	0.08	0.01	0.18	0.01	2.01	0.22	0.47	1169.7	158.1	1089.8	50.6	1118.4	73.3	1086.0	100.0	1085.7	25.1	1085.7	37.3	1086.0	100.0	0.0	(Cc)
NIST	25	74	0.3	0.08	0.01	0.18	0.01	1.90	0.21	0.46	1144.9	159.6	1046.6	48.5	1080.5	72.0	1042.0	102.0	1041.9	24.1	1041.9	36.8	1042.0	102.0	0.0	(Cc)
NIST	26	73	0.4	0.08	0.01	0.18	0.01	1.86	0.20	0.46	1090.0	161.8	1054.5	48.9	1067.7	71.8	1052.7	99.1	1052.7	24.3	1052.7	36.2	1052.7	99.1	0.0	(Cc)

91500	26	75	0.3	0.07	0.01	0.18	0.01	1.78	0.20	0.46	997.9	167.8	1053.3	48.8	1036.9	71.5	1055.6	96.0	1055.6	24.5	1055.6	35.4	1055.6	96.0	0.0	(Ce)
91500	25	71	0.3	0.07	0.01	0.18	0.01	1.83	0.20	0.46	1057.2	164.9	1056.1	49.5	1058.0	72.0	1055.9	98.0	1055.9	24.7	1055.9	36.0	1055.9	98.0	0.0	(Ce)
91500	25	74	0.3	0.07	0.01	0.18	0.01	1.83	0.20	0.46	1003.5	166.8	1077.8	50.2	1055.0	72.0	1081.2	94.2	1081.2	25.3	1081.2	35.5	1081.2	94.2	0.0	(Ce)
ST9ST1-79	132	284	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.32	11.3	468.1	54.9	3.2	55.3	10.1	54.9	214.7	54.9	1.6	54.9	5.1	54.9	1.6	0.0	(Ce)
ST9ST1-80	300	531	0.6	0.05	0.01	0.01	0.00	0.07	0.01	0.37	303.5	289.3	58.4	2.6	66.3	7.8	57.9	154.2	57.9	1.3	57.9	3.9	57.9	1.3	0.0	(Ce)
ST9ST1-82	12	26	0.5	0.04	0.04	0.01	0.00	0.06	0.06	0.19	-232.5	2292.6	69.2	11.6	62.9	54.7	69.2	949.5	69.2	5.8	69.2	27.3	69.2	5.8	0.0	(Ce)
ST9ST1-83	91	164	0.6	0.04	0.01	0.01	0.00	0.05	0.01	0.28	-126.3	701.7	53.4	4.1	51.0	13.7	53.4	301.7	53.4	2.0	53.4	6.9	53.4	2.0	0.0	(Ce)
ST9ST1-84	55	101	0.5	0.06	0.02	0.01	0.00	0.07	0.02	0.32	747.8	650.6	49.9	4.8	69.2	19.8	48.7	467.9	48.7	2.3	48.7	9.6	48.7	2.3	0.0	(Ce)
ST9ST1-85	155	301	0.5	0.21	0.02	0.01	0.00	0.30	0.02	0.66	2878.3	145.2	64.8	3.4	262.5	18.3	51.3	317.8	51.4	1.1	51.4	6.8	51.4	1.1	0.0	(Ce)
ST9ST1-86	288	345	0.8	0.05	0.01	0.01	0.00	0.06	0.01	0.32	33.0	422.6	54.8	3.0	55.7	9.3	54.8	196.6	54.8	1.5	54.8	4.6	54.8	1.5	0.0	(Ce)
ST9ST1-87	217	452	0.5	0.07	0.01	0.01	0.00	0.08	0.01	0.41	803.0	259.8	58.3	2.8	82.5	9.4	56.8	184.9	56.8	1.3	56.8	4.5	56.8	1.3	0.0	(Ce)
ST9ST1-90	202	540	0.4	0.05	0.01	0.01	0.00	0.07	0.01	0.38	411.3	269.3	60.3	2.7	71.6	8.0	59.6	152.4	59.6	1.3	59.6	3.9	59.6	1.3	0.0	(Ce)
ST9ST1-91	252	809	0.3	0.05	0.01	0.01	0.00	0.07	0.01	0.40	300.4	235.3	61.1	2.4	69.2	6.7	60.6	124.0	60.6	1.2	60.6	3.3	60.6	1.2	0.0	(Ce)
OD3	702	552	1.3	0.06	0.01	0.01	0.00	0.04	0.01	0.34	530.4	443.4	34.6	2.3	43.9	8.3	34.0	278.5	34.0	1.1	34.0	4.0	34.0	1.1	0.0	(Ce)
GJ1	19	385	0.1	0.06	0.00	0.10	0.00	0.84	0.05	0.55	600.4	123.9	606.1	18.5	616.6	26.7	605.1	53.2	605.1	9.2	605.1	13.4	605.1	9.2	0.0	(Ce)
NIST	25	73	0.3	0.07	0.01	0.18	0.01	1.84	0.14	0.57	1016.6	154.4	1057.8	43.3	1061.2	51.4	1057.3	65.1	1057.3	21.6	1057.3	25.8	1057.3	65.1	0.0	(Ce)
NIST	24	69	0.3	0.08	0.01	0.18	0.01	1.90	0.15	0.58	1075.8	151.5	1060.7	43.9	1082.5	51.6	1057.6	65.7	1057.6	21.8	1057.6	26.0	1057.6	65.7	0.0	(Ce)
NIST	24	72	0.3	0.07	0.01	0.18	0.01	1.90	0.15	0.57	1022.2	153.3	1082.4	44.6	1079.5	51.7	1082.8	63.5	1082.8	22.3	1082.8	25.8	1082.8	63.5	0.0	(Ce)
91500	26	75	0.3	0.07	0.01	0.18	0.01	1.81	0.15	0.56	997.7	162.5	1051.1	44.8	1050.5	53.6	1051.1	68.2	1051.1	22.4	1051.1	26.8	1051.1	68.2	0.0	(Ce)
91500	26	73	0.4	0.07	0.01	0.18	0.01	1.88	0.15	0.57	1025.5	156.4	1073.2	44.9	1074.4	52.6	1073.0	65.5	1073.0	22.5	1073.0	26.3	1073.0	65.5	0.0	(Ce)
91500	25	70	0.4	0.07	0.01	0.18	0.01	1.87	0.15	0.57	1053.6	160.8	1053.1	45.2	1070.0	54.1	1050.8	69.7	1050.8	22.5	1050.8	27.3	1050.8	69.7	0.0	(Ce)
ST9ST1-92	195	1524	0.1	0.05	0.00	0.01	0.00	0.08	0.01	0.50	146.0	196.1	69.8	3.4	73.7	7.0	69.6	107.9	69.6	1.7	69.6	3.5	69.6	1.7	0.0	(Ce)
ST9ST1-93	191	236	0.8	0.05	0.01	0.01	0.00	0.06	0.01	0.35	177.4	491.4	50.6	3.7	54.5	11.2	50.3	254.9	50.3	1.9	50.3	5.6	50.3	1.9	0.0	(Ce)
ST9ST1-94	663	1619	0.4	0.05	0.00	0.01	0.00	0.05	0.01	0.48	98.4	211.5	49.1	2.5	51.3	5.2	49.0	113.1	49.0	1.2	49.0	2.6	49.0	1.2	0.0	(Ce)
ST9ST1-95	102	234	0.4	0.06	0.01	0.01	0.00	0.08	0.01	0.39	462.0	389.7	67.2	4.6	81.2	13.9	66.3	237.4	66.3	2.3	66.3	6.8	66.3	2.3	0.0	(Ce)
ST9ST1-96	42	101	0.4	0.08	0.02	0.01	0.00	0.09	0.02	0.38	1101.9	553.0	53.7	5.5	87.6	22.5	51.6	491.9	51.6	2.5	51.6	10.7	51.6	2.5	0.0	(Ce)
ST9ST1-97	171	272	0.6	0.11	0.01	0.01	0.00	0.15	0.02	0.52	1856.1	237.0	59.8	4.1	141.4	17.7	54.6	337.9	54.6	1.7	54.6	7.7	54.6	1.7	0.0	(Ce)
ST9ST1-98	123	214	0.6	0.05	0.01	0.01	0.00	0.07	0.01	0.33	-0.7	546.6	65.1	4.8	64.9	14.3	65.1	254.8	65.1	2.4	65.1	7.1	65.1	2.4	0.0	(Ce)
ST9ST1-100	77	135	0.6	0.05	0.01	0.01	0.00	0.07	0.02	0.32	237.9	663.7	58.0	5.2	63.9	17.6	57.6	354.7	57.6	2.6	57.6	8.7	57.6	2.6	0.0	(Ce)
ST9ST1-102	498	607	0.8	0.05	0.01	0.01	0.00	0.07	0.01	0.43	211.2	279.1	62.9	3.5	68.4	8.5	62.6	151.1	62.6	1.7	62.6	4.2	62.6	1.7	0.0	(Ce)
ST9ST1-103	131	232	0.6	0.06	0.01	0.01	0.00	0.07	0.01	0.38	563.6	434.8	54.4	4.1	69.1	13.3	53.4	282.0	53.5	2.0	53.5	6.5	53.5	2.0	0.0	(Ce)

OD3	286	510	0.6	0.07	0.01	0.01	0.00	0.06	0.01	0.42	1001.5	353.8	36.9	2.7	58.0	9.8	35.6	301.2	35.6	1.3	35.6	4.6	35.6	1.3	0.0	(Cc)
GJ1	17	343	0.1	0.06	0.00	0.10	0.00	0.86	0.07	0.57	674.1	139.4	602.6	27.9	628.9	40.3	600.0	81.3	600.0	13.8	600.0	20.2	600.0	13.8	0.0	(Cc)
NIST	25	72	0.3	0.07	0.01	0.17	0.01	1.77	0.19	0.56	982.9	177.2	1036.4	56.6	1034.7	67.9	1036.6	87.0	1036.6	28.3	1036.6	33.9	1036.6	87.0	0.0	(Cc)
NIST	25	70	0.4	0.07	0.01	0.18	0.01	1.84	0.19	0.57	1010.8	171.5	1058.2	57.1	1058.4	67.5	1058.2	85.0	1058.2	28.6	1058.2	33.8	1058.2	85.0	0.0	(Cc)
NIST	25	67	0.4	0.07	0.01	0.17	0.01	1.82	0.19	0.57	1038.9	175.4	1038.4	56.9	1054.1	68.6	1036.2	89.2	1036.2	28.3	1036.2	34.5	1036.2	89.2	0.0	(Cc)
91500	25	71	0.4	0.08	0.01	0.18	0.01	1.95	0.20	0.58	1086.6	166.1	1081.1	58.1	1098.8	68.0	1078.6	85.5	1078.6	28.9	1078.6	34.3	1078.6	85.5	0.0	(Cc)
91500	24	72	0.3	0.07	0.01	0.18	0.01	1.93	0.19	0.58	1068.1	162.5	1081.3	57.2	1092.8	66.7	1079.7	83.1	1079.7	28.5	1079.7	33.5	1079.7	83.1	0.0	(Cc)
91500	25	73	0.3	0.07	0.01	0.18	0.01	1.89	0.19	0.57	1020.7	165.6	1082.6	57.4	1078.0	66.7	1083.3	81.9	1083.3	28.7	1083.3	33.3	1083.3	81.9	0.0	(Cc)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 85
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age}) / (^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

B.2 Yuubetsu Formation (ST10YU5)

U-Pb LA-ICP-MS Detrital Zircon Data of Yuubetsu Formation

Sample Location: Station-10, Akkeshi Bay Area, Eastern Hokkaido, Japan

Formation / Group: Yuubetsu Formation / Urahoro Group

Belt: Nemuro Belt

Sample Type: Sandstone (medium sandstone)

Grain Number	Th (PPM)	U (PPM)	Th/U	Isotopic Ratios							U-Pb Age (Ma)										Preferred Age	± 2σ	Disc. (%)			
											before Stacey-Kramers Correction					after Stacey-Kramers Correction										
				207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ	Error Corr.	207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ	207Pb/206Pb	± 2σ	206Pb/238U	± 2σ					207Pb/235U	± 2σ
ST10YU5-2	122	261	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.52	375.6	277.7	58.9	3.9	68.6	8.5	58.2	153.0	58.2	1.9	58.2	4.1	58.2	1.9	0.0	(Cc.)
ST10YU5-3	152	280	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.49	167.5	303.4	55.8	3.6	59.6	7.8	55.5	149.6	55.5	1.8	55.5	3.8	55.5	1.8	0.0	(Cc.)
ST10YU5-4	66	140	0.5	0.06	0.01	0.01	0.00	0.07	0.01	0.47	488.6	335.3	59.0	4.3	72.2	10.7	58.2	197.6	58.2	2.1	58.2	5.1	58.2	2.1	0.0	(Cc.)
ST10YU5-5	129	287	0.5	0.05	0.01	0.01	0.00	0.08	0.01	0.53	340.3	251.0	71.6	4.5	81.7	9.2	71.0	135.9	71.0	2.2	71.0	4.5	71.0	2.2	0.0	(Cc.)
ST10YU5-7	134	241	0.6	0.05	0.01	0.01	0.00	0.07	0.01	0.50	107.4	292.5	70.7	4.5	73.2	9.1	70.5	138.6	70.5	2.3	70.5	4.5	70.5	2.3	0.0	(Cc.)
ST10YU5-8	122	239	0.5	0.16	0.01	0.01	0.00	0.30	0.02	0.76	2483.0	127.9	82.8	5.3	263.2	19.6	70.4	228.3	70.4	1.9	70.4	6.8	70.4	1.9	0.0	(Cc.)
ST10YU5-10	95	188	0.5	0.07	0.01	0.01	0.00	0.10	0.01	0.57	1064.9	237.4	63.7	4.4	101.1	11.7	61.4	192.3	61.4	2.0	61.4	5.2	61.4	2.0	0.0	(Cc.)
ST10YU5-11	273	234	1.2	0.05	0.01	0.01	0.00	0.06	0.01	0.48	150.8	322.0	57.1	3.9	60.5	8.3	56.8	155.8	56.8	1.9	56.8	4.1	56.8	1.9	0.0	(Cc.)
ST10YU5-12	120	215	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.47	301.7	337.6	54.2	3.8	61.3	8.9	53.7	179.5	53.7	1.9	53.7	4.3	53.7	1.9	0.0	(Cc.)
ST10YU5-13	739	1162	0.6	0.05	0.00	0.01	0.00	0.07	0.01	0.68	233.5	139.7	65.7	3.5	71.9	5.5	65.4	74.8	65.4	1.7	65.4	2.6	65.4	1.7	0.0	(Cc.)
OD3	726	544	1.3	0.06	0.01	0.01	0.00	0.04	0.00	0.54	551.4	240.6	32.8	2.1	41.9	4.8	32.2	150.5	32.3	1.0	32.3	2.2	32.3	1.0	0.0	(Cc.)
GJ1	19	361	0.1	0.06	0.00	0.09	0.00	0.77	0.05	0.80	543.6	83.3	577.3	28.6	579.9	28.7	577.1	42.8	577.1	14.3	577.1	14.3	577.1	14.3	0.0	(Cc.)
NIST	26	75	0.3	0.07	0.00	0.18	0.01	1.90	0.14	0.76	1025.8	99.4	1088.5	54.9	1081.9	47.7	1089.5	45.8	1089.5	27.5	1089.5	23.8	1089.5	45.8	0.0	(Cc.)
NIST	25	71	0.3	0.07	0.00	0.19	0.01	1.92	0.14	0.76	1028.0	100.5	1097.7	55.4	1088.8	48.1	1099.0	46.0	1099.0	27.8	1099.0	24.0	1099.0	46.0	0.0	(Cc.)
NIST	26	73	0.4	0.08	0.00	0.18	0.01	1.92	0.14	0.77	1113.4	98.6	1054.3	53.4	1087.9	47.9	1049.6	49.0	1049.6	26.5	1049.6	23.9	1049.6	49.0	0.0	(Cc.)
91500	26	73	0.4	0.07	0.00	0.18	0.01	1.80	0.13	0.75	1014.2	104.6	1040.8	53.0	1046.1	47.8	1040.1	48.9	1040.1	26.5	1040.1	23.9	1040.1	48.9	0.0	(Cc.)
91500	28	76	0.4	0.07	0.00	0.17	0.01	1.82	0.13	0.76	1039.2	102.4	1039.3	52.8	1053.2	47.6	1037.4	48.9	1037.4	26.3	1037.4	23.8	1037.4	48.9	0.0	(Cc.)
91500	27	74	0.4	0.07	0.00	0.18	0.01	1.84	0.13	0.76	1020.9	103.3	1057.4	53.7	1059.5	47.9	1057.1	48.0	1057.1	26.8	1057.1	23.9	1057.1	48.0	0.0	(Cc.)
ST10YU5-14	368	829	0.4	0.07	0.01	0.01	0.00	0.10	0.01	0.61	856.9	197.5	67.1	4.8	96.5	10.9	65.3	162.2	65.3	2.3	65.3	4.9	65.3	2.3	0.0	(Cc.)
ST10YU5-17	256	485	0.5	0.05	0.00	0.01	0.00	0.06	0.01	0.58	83.1	229.9	58.2	4.1	60.0	7.0	58.1	120.6	58.1	2.0	58.1	3.5	58.1	2.0	0.0	(Cc.)
ST10YU5-18	163	374	0.4	0.06	0.01	0.01	0.00	0.07	0.01	0.59	540.8	219.6	57.2	4.1	71.7	8.5	56.3	149.1	56.3	2.0	56.3	3.9	56.3	2.0	0.0	(Cc.)

ST10YU5-19	215	355	0.6	0.06	0.01	0.01	0.00	0.08	0.01	0.59	642.3	223.0	58.6	4.3	76.9	9.2	57.5	158.4	57.5	2.1	57.5	4.2	57.5	2.1	0.0	(Cc.)
ST10YU5-20	65	95	0.7	0.10	0.02	0.01	0.00	0.13	0.02	0.57	1620.8	297.0	61.2	5.7	127.8	19.7	57.0	346.7	57.0	2.5	57.0	8.4	57.0	2.5	0.0	(Cc.)
ST10YU5-21	1001	3204	0.3	0.07	0.01	0.01	0.00	0.10	0.01	0.63	849.1	177.4	65.6	4.6	94.1	10.0	63.8	149.2	63.8	2.2	63.8	4.4	63.8	2.2	0.0	(Cc.)
ST10YU5-22	140	250	0.6	0.06	0.01	0.01	0.00	0.09	0.01	0.55	509.5	263.2	67.9	5.1	83.6	11.0	66.9	168.7	66.9	2.5	66.9	5.2	66.9	2.5	0.0	(Cc.)
ST10YU5-23	64	108	0.6	0.07	0.01	0.01	0.00	0.10	0.02	0.52	958.8	374.3	63.1	6.0	95.3	16.9	61.0	291.9	61.1	2.8	61.1	7.8	61.1	2.8	0.0	(Cc.)
ST10YU5-24	75	208	0.4	0.09	0.01	0.01	0.00	0.15	0.02	0.58	1439.9	264.4	74.9	6.4	141.4	19.6	70.7	281.8	70.7	2.9	70.7	8.5	70.7	2.9	0.0	(Cc.)
ST10YU5-25	76	163	0.5	0.06	0.01	0.01	0.00	0.09	0.01	0.52	520.1	310.5	67.7	5.4	83.7	12.4	66.7	195.8	66.7	2.6	66.7	5.9	66.7	2.6	0.0	(Cc.)
ST10YU5-26	140	264	0.5	0.05	0.00	0.03	0.00	0.18	0.02	0.63	289.6	181.2	159.6	10.8	171.5	17.1	159.0	106.0	158.8	5.4	158.8	8.3	158.8	5.4	0.0	(Cc.)
OD3	1051	928	1.1	0.06	0.00	0.01	0.00	0.04	0.00	0.61	415.3	202.6	32.6	2.3	39.2	4.4	32.2	132.6	32.2	1.1	32.2	2.1	32.2	1.1	0.0	(Cc.)
GJ1	19	353	0.1	0.06	0.00	0.09	0.01	0.79	0.07	0.74	597.3	89.5	578.2	35.7	591.8	39.2	576.9	66.1	576.9	17.7	576.9	19.5	576.9	17.7	0.0	(Cc.)
NIST	26	70	0.4	0.07	0.00	0.17	0.01	1.78	0.17	0.72	1012.3	110.9	1030.4	64.0	1038.7	61.1	1029.3	67.3	1029.3	31.9	1029.3	30.6	1029.3	67.3	0.0	(Cc.)
NIST	28	74	0.4	0.07	0.00	0.17	0.01	1.80	0.17	0.72	1037.3	108.8	1028.9	63.8	1045.7	61.1	1026.7	67.7	1026.7	31.8	1026.7	30.6	1026.7	67.7	0.0	(Cc.)
NIST	27	72	0.4	0.07	0.00	0.18	0.01	1.82	0.17	0.72	1019.0	109.6	1046.9	64.9	1052.0	61.4	1046.1	66.4	1046.1	32.4	1046.1	30.7	1046.1	66.4	0.0	(Cc.)
91500	25	70	0.4	0.08	0.00	0.18	0.01	1.96	0.18	0.72	1082.2	105.6	1088.9	67.1	1101.2	62.5	1087.2	65.7	1087.2	33.5	1087.2	31.3	1087.2	65.7	0.0	(Cc.)
91500	27	72	0.4	0.07	0.00	0.18	0.01	1.91	0.18	0.72	1036.0	107.2	1087.5	67.1	1084.9	62.1	1087.9	64.5	1087.9	33.6	1087.9	31.0	1087.9	64.5	0.0	(Cc.)
91500	24	70	0.3	0.07	0.00	0.19	0.01	1.94	0.18	0.72	1048.6	109.3	1095.3	67.8	1094.2	62.8	1095.4	65.3	1095.4	33.9	1095.4	31.4	1095.4	65.3	0.0	(Cc.)
ST10YU5-27	740	1677	0.4	0.06	0.01	0.01	0.00	0.09	0.01	0.42	476.9	263.8	71.1	3.4	85.6	9.5	70.2	151.5	70.2	1.7	70.2	4.6	70.2	1.7	0.0	(Cc.)
ST10YU5-29	163	261	0.6	0.05	0.01	0.01	0.00	0.07	0.01	0.40	210.4	278.2	64.7	3.0	69.7	7.9	64.3	138.0	64.3	1.5	64.3	3.9	64.3	1.5	0.0	(Cc.)
ST10YU5-31	104	222	0.5	0.05	0.01	0.01	0.00	0.08	0.01	0.40	373.0	303.7	69.0	3.6	79.6	10.0	68.4	164.5	68.4	1.8	68.4	4.9	68.4	1.8	0.0	(Cc.)
ST10YU5-33	148	1039	0.1	0.08	0.01	0.01	0.00	0.09	0.01	0.47	1078.0	265.6	54.2	3.2	86.6	10.4	52.2	214.2	52.2	1.5	52.2	4.8	52.2	1.5	0.0	(Cc.)
ST10YU5-34	358	519	0.7	0.09	0.02	0.01	0.00	0.11	0.03	0.44	1347.5	556.1	58.9	6.8	106.9	27.1	55.8	534.2	55.8	3.1	55.8	12.5	55.8	3.1	-0.1	(Cc.)
ST10YU5-36	61	112	0.5	0.14	0.03	0.01	0.00	0.23	0.04	0.58	2234.9	368.7	73.4	8.0	206.5	35.3	64.6	552.9	64.6	3.1	64.6	14.8	64.6	3.1	0.0	(Cc.)
ST10YU5-37	184	596	0.3	0.09	0.01	0.01	0.00	0.12	0.01	0.52	1452.9	171.7	59.5	2.7	113.8	9.3	56.1	173.6	56.1	1.2	56.1	4.1	56.1	1.2	0.0	(Cc.)
ST10YU5-38	66	250	0.3	0.06	0.01	0.01	0.00	0.08	0.01	0.44	721.7	246.1	58.4	2.9	78.9	8.5	57.1	163.8	57.1	1.4	57.1	4.0	57.1	1.4	0.0	(Cc.)
ST10YU5-39	153	235	0.7	0.16	0.04	0.01	0.00	0.21	0.04	0.60	2445.1	412.4	59.6	7.6	190.8	37.0	51.0	697.6	51.0	2.8	51.0	14.8	51.0	2.8	0.1	(Cc.)
OD3	1220	1810	0.7	0.14	0.01	0.01	0.00	0.10	0.01	0.62	2171.3	104.3	33.6	1.3	96.1	5.5	29.8	166.4	29.8	0.5	29.8	2.1	29.8	0.5	0.0	(Cc.)
GJ1	19	347	0.1	0.06	0.00	0.09	0.00	0.78	0.04	0.59	630.2	97.0	563.6	16.2	584.0	22.6	561.7	47.1	561.7	8.0	561.7	11.3	561.7	8.0	0.0	(Cc.)
NIST	25	69	0.4	0.08	0.00	0.18	0.01	1.90	0.11	0.59	1098.3	110.8	1055.2	34.1	1079.9	39.8	1051.8	50.8	1051.8	16.9	1051.8	20.1	1051.8	50.8	0.0	(Cc.)
NIST	27	71	0.4	0.07	0.00	0.18	0.01	1.85	0.11	0.58	1052.3	112.4	1053.8	34.1	1063.8	39.7	1052.5	50.0	1052.5	17.0	1052.5	19.9	1052.5	50.0	0.0	(Cc.)
NIST	24	68	0.4	0.07	0.00	0.18	0.01	1.88	0.11	0.58	1064.8	114.4	1061.4	34.8	1073.0	40.5	1059.8	51.0	1059.8	17.3	1059.8	20.3	1059.8	51.0	0.0	(Cc.)
91500	25	68	0.4	0.07	0.00	0.18	0.01	1.86	0.11	0.58	1051.8	113.0	1056.5	34.3	1065.4	39.9	1055.2	50.2	1055.2	17.1	1055.2	20.0	1055.2	50.2	0.0	(Cc.)
91500	24	68	0.4	0.07	0.00	0.18	0.01	1.81	0.11	0.58	988.5	115.2	1062.2	34.5	1048.7	39.9	1064.2	49.0	1064.2	17.3	1064.2	19.8	1064.2	49.0	0.0	(Cc.)

91500	27	73	0.4	0.07	0.00	0.18	0.01	1.92	0.12	0.58	1051.5	112.6	1089.0	35.2	1087.2	40.3	1089.3	49.0	1089.3	17.6	1089.3	20.1	1089.3	49.0	0.0	(Cc.)
ST10YU5-40	532	431	1.2	0.05	0.01	0.01	0.00	0.06	0.01	0.38	137.4	375.6	53.6	3.2	56.6	8.6	53.4	182.1	53.4	1.6	53.4	4.3	53.4	1.6	0.0	(Cc.)
ST10YU5-43	187	280	0.7	0.08	0.01	0.01	0.00	0.09	0.01	0.47	1190.4	281.8	53.6	3.4	90.9	11.9	51.3	248.4	51.3	1.6	51.3	5.4	51.3	1.6	0.0	(Cc.)
ST10YU5-44	123	600	0.2	0.05	0.00	0.01	0.00	0.08	0.01	0.44	291.0	193.1	66.2	2.6	74.1	6.3	65.7	106.7	65.7	1.3	65.7	3.1	65.7	1.3	0.0	(Cc.)
ST10YU5-46	67	155	0.4	0.52	0.05	0.02	0.00	1.58	0.13	0.99	4303.2	148.1	137.6	10.9	964.2	50.4	53.6	132.1	53.6	0.8	53.6	3.0	53.6	0.8	0.0	(Cc.)
ST10YU5-47	379	1290	0.3	0.07	0.00	0.01	0.00	0.09	0.01	0.50	829.5	126.6	58.5	2.0	83.4	5.5	56.9	102.4	56.9	0.9	56.9	2.6	56.9	0.9	0.0	(Cc.)
ST10YU5-48	36	44	0.8	0.14	0.03	0.01	0.00	0.15	0.03	0.56	2253.8	394.6	48.1	5.5	141.9	27.1	42.1	626.4	42.1	2.1	42.1	11.0	42.1*	2.1*	-0.1	(Cc.)
ST10YU5-49	409	896	0.5	0.05	0.00	0.01	0.00	0.06	0.00	0.45	163.0	174.4	55.2	2.0	58.9	4.6	55.0	91.8	55.0	1.0	55.0	2.3	55.0	1.0	0.0	(Cc.)
ST10YU5-50	132	575	0.2	0.06	0.01	0.01	0.00	0.08	0.01	0.40	723.4	368.5	56.5	3.8	76.9	12.4	55.3	251.1	55.3	1.8	55.3	5.9	55.3	1.8	0.0	(Cc.)
ST10YU5-51	54	157	0.3	0.10	0.03	0.01	0.00	0.11	0.03	0.46	1615.1	584.4	52.6	6.9	110.4	30.3	49.0	666.4	49.0	3.0	49.0	13.7	49.0	3.0	-0.1	(Cc.)
ST10YU5-52	279	443	0.6	0.05	0.00	0.01	0.00	0.07	0.01	0.42	176.2	220.1	66.2	2.7	70.7	6.7	65.9	112.9	65.9	1.3	65.9	3.3	65.9	1.3	0.0	(Cc.)
ST10YU5-53	61	204	0.3	0.15	0.03	0.01	0.00	0.26	0.04	0.63	2398.1	282.2	75.6	7.0	232.0	30.5	65.1	454.0	65.1	2.6	65.1	12.3	65.1	2.6	0.1	(Cc.)
OD3	978	792	1.2	0.06	0.01	0.00	0.00	0.04	0.00	0.43	485.3	215.5	30.3	1.3	37.6	3.7	29.9	133.7	29.9	0.6	29.9	1.8	29.9	0.6	0.0	(Cc.)
GJ1	19	360	0.1	0.06	0.00	0.09	0.00	0.78	0.04	0.55	620.3	87.9	561.8	16.2	582.7	24.3	559.9	52.5	559.9	8.0	559.9	12.2	559.9	8.0	0.0	(Cc.)
NIST	25	69	0.4	0.07	0.00	0.18	0.01	1.86	0.12	0.55	1054.7	106.0	1051.7	34.3	1066.4	42.1	1049.6	54.7	1049.6	17.1	1049.6	21.2	1049.6	54.7	0.0	(Cc.)
NIST	24	69	0.3	0.07	0.00	0.18	0.01	1.81	0.12	0.55	991.4	108.3	1057.4	34.5	1049.7	42.0	1058.5	53.3	1058.5	17.3	1058.5	20.9	1058.5	53.3	0.0	(Cc.)
NIST	26	74	0.4	0.07	0.00	0.18	0.01	1.92	0.12	0.55	1054.4	105.6	1084.1	35.2	1088.2	42.5	1083.5	53.4	1083.5	17.6	1083.5	21.3	1083.5	53.4	0.0	(Cc.)
91500	24	68	0.3	0.07	0.00	0.18	0.01	1.91	0.12	0.55	1063.3	106.4	1072.3	35.0	1083.2	42.6	1070.7	54.4	1070.7	17.5	1070.7	21.4	1070.7	54.4	0.0	(Cc.)
91500	24	69	0.3	0.07	0.00	0.18	0.01	1.83	0.12	0.55	1028.7	107.9	1049.2	34.3	1056.2	42.2	1048.2	54.7	1048.2	17.1	1048.2	21.2	1048.2	54.7	0.0	(Cc.)
91500	22	66	0.3	0.07	0.00	0.18	0.01	1.88	0.12	0.55	1053.7	107.2	1063.5	34.8	1074.1	42.5	1062.1	54.7	1062.1	17.4	1062.1	21.4	1062.1	54.7	0.0	(Cc.)
ST10YU5-55	300	457	0.7	0.05	0.01	0.01	0.00	0.06	0.01	0.48	92.1	371.3	55.6	4.6	57.5	9.6	55.5	185.6	55.5	2.3	55.5	4.8	55.5	2.3	0.0	(Cc.)
ST10YU5-57	100	208	0.5	0.10	0.02	0.01	0.00	0.17	0.04	0.55	1540.7	403.3	79.5	9.2	156.4	30.7	74.5	430.1	74.5	4.1	74.5	13.6	74.5	4.1	-0.1	(Cc.)
ST10YU5-58	197	627	0.3	0.05	0.01	0.01	0.00	0.07	0.01	0.48	374.5	384.2	59.9	5.2	69.5	12.3	59.3	222.8	59.3	2.6	59.3	5.9	59.3	2.6	0.0	(Cc.)
ST10YU5-59	157	343	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.55	-23.8	270.6	59.2	4.5	58.3	7.7	59.4	133.1	59.4	2.3	59.4	3.9	59.4	2.3	0.0	(Cc.)
ST10YU5-60	97	418	0.2	0.06	0.01	0.01	0.00	0.09	0.01	0.52	575.8	331.9	68.0	5.9	85.7	13.7	66.9	215.6	66.9	2.8	66.9	6.5	66.9	2.8	0.0	(Cc.)
ST10YU5-61	79	156	0.5	0.09	0.02	0.01	0.00	0.12	0.03	0.54	1501.4	422.6	60.2	7.1	118.1	24.4	56.5	444.5	56.5	3.2	56.5	10.7	56.5	3.2	-0.1	(Cc.)
ST13YU5-63	85	315	0.3	0.39	0.14	0.01	0.00	0.51	0.14	1.01	3861.0	548.1	59.7	16.2	415.6	91.9										
ST10YU5-64	132	961	0.1	0.14	0.05	0.01	0.00	0.20	0.06	0.62	2255.6	547.4	62.9	11.1	181.5	47.7	55.1	825.3	55.1	4.3	55.1	19.0	55.1	4.3	-0.1	(Cc.)
ST10YU5-65	54	157	0.3	0.30	0.07	0.01	0.00	0.61	0.12	0.82	3455.3	344.9	93.5	14.8	482.9	74.4	63.5	837.3	63.6	3.4	63.5	21.9	63.6	3.4	-0.1	(Cc.)
ST10YU5-66	123	374	0.3	0.10	0.02	0.01	0.00	0.14	0.03	0.55	1580.1	441.2	64.2	8.0	130.5	28.0	59.9	478.9	59.9	3.5	59.9	12.2	59.9	3.5	-0.1	(Cc.)
OD3	877	750	1.2	0.05	0.01	0.00	0.00	0.03	0.00	0.57	219.6	239.3	31.2	2.3	34.3	4.4	31.0	140.6	31.0	1.1	31.0	2.1	31.0	1.1	0.0	(Cc.)
GJ1	18	343	0.1	0.06	0.00	0.09	0.01	0.80	0.07	0.74	609.7	72.6	584.0	37.7	597.2	41.3	582.7	69.0	582.7	18.8	582.7	20.5	582.7	18.8	0.0	(Cc.)

NIST	23	67	0.3	0.07	0.00	0.19	0.01	1.96	0.19	0.72	1065.5	96.2	1102.6	71.1	1102.0	65.4	1102.7	67.3	1102.7	35.6	1102.7	32.7	1102.7	67.3	0.0	(Cc.)
NIST	23	68	0.3	0.07	0.00	0.18	0.01	1.88	0.18	0.72	1030.9	97.8	1078.9	69.7	1074.8	64.7	1079.5	67.5	1079.5	34.9	1079.5	32.3	1079.5	67.5	0.0	(Cc.)
NIST	22	65	0.3	0.07	0.00	0.18	0.01	1.93	0.19	0.72	1055.9	97.1	1093.6	70.6	1092.8	65.2	1093.7	67.6	1093.7	35.3	1093.7	32.6	1093.7	67.6	0.0	(Cc.)
91500	25	72	0.4	0.07	0.00	0.17	0.01	1.79	0.17	0.72	1008.7	99.0	1038.3	67.3	1040.2	63.6	1038.0	68.9	1038.0	33.6	1038.0	31.8	1038.0	68.9	0.0	(Cc.)
91500	25	71	0.4	0.07	0.00	0.17	0.01	1.76	0.17	0.72	992.6	99.8	1030.6	66.8	1029.8	63.3	1030.6	68.8	1030.6	33.4	1030.6	31.7	1030.6	68.8	0.0	(Cc.)
91500	26	74	0.4	0.08	0.00	0.17	0.01	1.89	0.18	0.72	1129.8	96.4	1033.8	67.1	1076.8	64.7	1027.9	73.1	1027.9	33.2	1027.9	32.5	1027.9	73.1	0.0	(Cc.)
ST10YU5-68	115	108	1.1	0.09	0.02	0.01	0.00	0.10	0.02	0.45	1401.4	329.0	51.0	4.0	94.3	15.8	48.3	355.3	48.3	1.8	48.3	7.2	48.3	1.8	0.0	(Cc.)
ST10YU5-69	54	133	0.4	0.12	0.00	0.29	0.01	4.84	0.40	0.44	1969.6	46.2	1642.7	53.1	1792.2	70.0	1605.7	85.0	1605.7	25.4	1605.7	39.5	1605.7	85.0	0.0	(Cc.)
ST10YU5-70	128	227	0.6	0.07	0.01	0.02	0.00	0.15	0.02	0.42	899.2	173.7	103.0	4.7	144.9	15.0	100.0	172.0	100.3	2.3	100.3	7.3	100.3	2.3	0.0	(Cc.)
ST10YU5-71	137	607	0.2	0.05	0.01	0.01	0.00	0.09	0.01	0.38	333.7	283.7	76.7	4.1	85.4	11.7	76.2	175.1	76.2	2.0	76.2	5.8	76.2	2.0	0.0	(Cc.)
ST10YU5-72	73	278	0.3	0.06	0.01	0.01	0.00	0.07	0.02	0.36	462.9	466.7	61.6	4.8	73.1	15.1	61.0	283.6	61.0	2.3	61.0	7.4	61.0	2.3	0.0	(Cc.)
ST10YU5-73	105	297	0.4	0.06	0.01	0.01	0.00	0.09	0.01	0.40	733.4	243.1	64.7	3.5	86.3	11.0	63.4	196.1	63.4	1.7	63.4	5.3	63.4	1.7	0.0	(Cc.)
ST10YU5-74	105	305	0.3	0.08	0.01	0.01	0.00	0.12	0.01	0.43	1233.3	202.9	68.7	3.7	115.5	13.5	65.7	228.4	65.7	1.7	65.7	6.3	65.7	1.7	0.0	(Cc.)
ST10YU5-75	96	127	0.8	0.06	0.01	0.01	0.00	0.07	0.01	0.40	698.7	371.0	53.8	3.9	71.1	12.4	52.7	262.7	52.7	1.9	52.7	6.0	52.7	1.9	0.0	(Cc.)
ST10YU5-76	592	568	1.0	0.06	0.00	0.01	0.00	0.08	0.01	0.40	638.0	175.1	59.0	2.6	75.6	8.0	57.9	155.1	57.9	1.3	57.9	3.9	57.9	1.3	0.0	(Cc.)
ST10YU5-77	177	1721	0.1	0.05	0.00	0.01	0.00	0.07	0.01	0.39	343.7	179.6	62.1	2.7	69.9	7.4	61.6	134.7	61.6	1.3	61.6	3.6	61.6	1.3	0.0	(Cc.)
ST10YU5-78	81	160	0.5	0.06	0.01	0.01	0.00	0.09	0.01	0.41	744.7	277.8	65.7	3.9	88.1	12.3	64.3	214.8	64.3	1.9	64.3	5.9	64.3	1.9	0.0	(Cc.)
ST10YU5-79	208	476	0.4	0.06	0.01	0.01	0.00	0.08	0.01	0.39	469.8	344.5	63.6	4.1	75.6	12.1	62.9	217.9	62.9	2.0	62.9	5.9	62.9	2.0	0.0	(Cc.)
OD3	351	369	1.0	0.09	0.01	0.01	0.00	0.07	0.01	0.45	1417.2	234.3	38.2	2.3	72.1	9.5	36.2	280.6	36.2	1.1	36.2	4.3	36.2	1.1	0.0	(Cc.)
GJ1	19	376	0.1	0.06	0.00	0.10	0.00	0.81	0.07	0.42	658.6	71.0	585.3	19.9	600.9	38.7	583.8	87.1	583.8	9.9	583.8	19.5	583.8	9.9	0.0	(Cc.)
NIST	25	71	0.4	0.07	0.00	0.18	0.01	1.79	0.16	0.44	1016.0	98.3	1055.9	39.2	1043.5	59.9	1057.7	81.6	1057.7	19.7	1057.7	29.7	1057.7	81.6	0.0	(Cc.)
NIST	25	70	0.4	0.07	0.00	0.18	0.01	1.77	0.16	0.44	999.9	99.1	1048.1	38.9	1033.1	59.7	1050.3	81.5	1050.3	19.5	1050.3	29.6	1050.3	81.5	0.0	(Cc.)
NIST	26	73	0.4	0.08	0.00	0.18	0.01	1.90	0.17	0.44	1137.0	95.7	1051.4	39.3	1080.1	60.9	1047.4	86.8	1047.4	19.5	1047.4	31.0	1047.4	86.8	0.0	(Cc.)
91500	26	77	0.3	0.08	0.00	0.18	0.01	1.91	0.17	0.44	1131.9	94.2	1061.9	39.4	1085.6	60.9	1058.6	85.6	1058.6	19.6	1058.6	30.9	1058.6	85.6	0.0	(Cc.)
91500	25	69	0.4	0.08	0.00	0.18	0.01	1.87	0.17	0.44	1076.7	96.9	1068.2	39.8	1071.5	60.8	1067.7	83.3	1067.7	19.9	1067.7	30.4	1067.7	83.3	0.0	(Cc.)
91500	26	73	0.4	0.08	0.00	0.18	0.01	1.96	0.18	0.44	1121.9	93.4	1092.7	40.3	1103.0	61.3	1091.2	83.3	1091.2	20.1	1091.2	30.9	1091.2	83.3	0.0	(Cc.)
ST10YU5-80	74	189	0.4	0.05	0.01	0.01	0.00	0.08	0.01	0.45	328.4	322.6	67.9	4.6	76.0	11.2	67.4	182.2	67.4	2.3	67.4	5.5	67.4	2.3	0.0	(Cc.)
ST10YU5-82	274	655	0.4	0.06	0.01	0.01	0.00	0.08	0.01	0.46	444.4	290.0	63.0	4.1	74.3	10.2	62.3	179.5	62.3	2.0	62.3	5.0	62.3	2.0	0.0	(Cc.)
ST10YU5-83	176	341	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.46	384.6	276.5	48.1	3.0	55.7	7.4	47.6	168.6	47.6	1.5	47.6	3.6	47.6	1.5	0.0	(Cc.)
ST10YU5-84	246	1421	0.2	0.07	0.00	0.01	0.00	0.09	0.01	0.57	803.2	128.5	61.7	3.2	85.5	7.6	60.2	127.8	60.3	1.6	60.3	3.5	60.3	1.6	0.0	(Cc.)
ST10YU5-86	283	1184	0.2	0.09	0.00	0.01	0.00	0.11	0.01	0.59	1344.0	109.3	57.9	3.0	103.9	8.9	55.0	159.4	55.0	1.4	55.0	3.8	55.0	1.4	0.0	(Cc.)
ST10YU5-87	106	271	0.4	0.05	0.01	0.01	0.00	0.08	0.01	0.47	400.8	273.3	65.5	4.2	75.6	9.9	64.9	165.8	64.9	2.0	64.9	4.8	64.9	2.0	0.0	(Cc.)

ST10YU5-88	110	346	0.3	0.08	0.01	0.01	0.00	0.11	0.01	0.53	1207.8	193.9	64.5	4.0	107.7	11.9	61.7	200.7	61.8	1.8	61.8	5.4	61.8	1.8	0.0	(Cc.)
ST10YU5-89	762	913	0.8	0.05	0.00	0.01	0.00	0.06	0.01	0.53	224.0	177.5	54.9	3.0	59.1	5.9	54.6	112.7	54.6	1.5	54.6	2.9	54.6	1.5	0.0	(Cc.)
ST10YU5-90	49	57	0.9	0.39	0.04	0.02	0.00	0.81	0.09	0.81	3874.3	157.3	96.3	8.3	605.2	48.7	54.5	621.1	54.5	1.3	54.5	13.9	54.5	1.3	0.0	(Cc.)
ST10YU5-91	129	346	0.4	0.08	0.00	0.02	0.00	0.24	0.02	0.57	1076.8	127.6	146.2	7.8	217.8	18.4	141.0	140.0	141.3	3.7	141.3	8.6	141.3	3.7	0.0	(Cc.)
ST10YU5-92	81	238	0.3	0.07	0.01	0.01	0.00	0.13	0.02	0.48	1047.2	314.6	83.9	6.4	128.2	19.5	81.1	264.9	81.1	3.0	81.1	9.2	81.1	3.0	0.0	(Cc.)
OD3	884	753	1.2	0.05	0.01	0.00	0.00	0.04	0.00	0.48	316.0	242.0	32.1	1.9	36.4	4.4	31.9	147.6	31.9	1.0	31.9	2.2	31.9	1.0	0.0	(Cc.)
GJ1	19	354	0.1	0.06	0.00	0.10	0.00	0.80	0.07	0.60	566.1	94.4	602.2	28.9	596.6	37.9	602.7	71.9	602.7	14.5	602.7	18.9	602.7	14.5	0.0	(Cc.)
NIST	27	78	0.3	0.08	0.00	0.18	0.01	1.92	0.17	0.60	1117.3	109.3	1069.1	52.9	1087.9	60.1	1066.5	74.8	1066.5	26.3	1066.5	30.3	1066.5	74.8	0.0	(Cc.)
NIST	25	70	0.4	0.07	0.00	0.18	0.01	1.88	0.17	0.59	1062.0	111.9	1075.5	53.3	1073.9	60.0	1075.7	72.9	1075.7	26.7	1075.7	30.0	1075.7	72.9	0.0	(Cc.)
NIST	26	73	0.4	0.08	0.00	0.19	0.01	1.97	0.18	0.60	1107.3	108.6	1100.1	54.2	1105.4	60.5	1099.3	72.7	1099.3	27.1	1099.3	30.3	1099.3	72.7	0.0	(Cc.)
91500	27	74	0.4	0.08	0.00	0.18	0.01	1.85	0.17	0.59	1095.1	111.7	1045.4	52.0	1064.4	59.7	1042.7	75.7	1042.7	25.9	1042.7	30.1	1042.7	75.7	0.0	(Cc.)
91500	25	69	0.4	0.07	0.00	0.17	0.01	1.76	0.16	0.59	1020.1	114.3	1033.3	51.4	1031.8	58.9	1033.5	73.9	1033.5	25.7	1033.5	29.4	1033.5	73.9	0.0	(Cc.)
91500	26	73	0.4	0.07	0.00	0.18	0.01	1.82	0.17	0.59	1042.4	112.8	1054.6	52.4	1053.4	59.4	1054.8	73.3	1054.8	26.2	1054.8	29.7	1054.8	73.3	0.0	(Cc.)
ST10YU5-93	47	143	0.3	0.08	0.01	0.01	0.00	0.11	0.01	0.43	1221.4	282.8	62.1	3.7	104.5	13.6	59.4	254.1	59.4	1.7	59.4	6.4	59.4	1.7	0.0	(Cc.)
ST10YU5-96	127	189	0.7	0.06	0.01	0.01	0.00	0.07	0.01	0.38	473.0	344.7	55.0	3.1	65.9	9.6	54.3	200.1	54.3	1.5	54.3	4.7	54.3	1.5	0.0	(Cc.)
ST10YU5-97	568	749	0.8	0.05	0.00	0.01	0.00	0.07	0.01	0.38	357.8	184.7	61.1	2.0	69.4	5.7	60.6	107.4	60.6	1.0	60.6	2.8	60.6	1.0	0.0	(Cc.)
ST10YU5-98	53	154	0.3	0.10	0.01	0.01	0.00	0.15	0.02	0.47	1564.3	269.3	74.1	4.7	146.2	18.4	69.5	290.9	69.5	2.1	69.5	8.5	69.5	2.1	0.0	(Cc.)
ST10YU5-100	187	314	0.6	0.06	0.01	0.01	0.00	0.09	0.01	0.39	623.4	230.8	69.1	2.9	87.8	9.0	68.0	149.5	68.0	1.4	68.0	4.4	68.0	1.4	0.0	(Cc.)
ST10YU5-102	123	528	0.2	0.05	0.01	0.01	0.00	0.07	0.01	0.38	399.4	211.1	60.4	2.2	69.8	6.5	59.8	122.8	59.8	1.1	59.8	3.2	59.8	1.1	0.0	(Cc.)
ST10YU5-103	85	182	0.5	0.06	0.01	0.01	0.00	0.07	0.01	0.37	478.7	357.1	57.8	3.3	69.3	10.5	57.1	209.4	57.1	1.6	57.1	5.1	57.1	1.6	0.0	(Cc.)
ST10YU5-104	368	493	0.7	0.06	0.01	0.01	0.00	0.07	0.01	0.38	481.4	259.5	57.8	2.5	69.3	7.8	57.0	155.2	57.1	1.2	57.1	3.8	57.1	1.2	0.0	(Cc.)
ST10YU5-105	80	158	0.5	0.06	0.01	0.01	0.00	0.08	0.01	0.37	528.9	372.4	60.6	3.7	74.2	11.7	59.8	223.9	59.8	1.8	59.8	5.7	59.8	1.8	0.0	(Cc.)
OD3	1210	794	1.5	0.06	0.01	0.01	0.00	0.04	0.00	0.38	435.2	225.5	33.6	1.3	40.0	4.0	33.2	135.0	33.2	0.6	33.2	2.0	33.2	0.6	0.0	(Cc.)
GJ1	19	359	0.1	0.06	0.00	0.10	0.00	0.80	0.05	0.40	602.4	103.4	590.9	13.1	594.7	26.2	590.5	58.4	590.5	6.6	590.5	13.1	590.5	6.6	0.0	(Cc.)
NIST	28	74	0.4	0.08	0.00	0.18	0.01	1.88	0.13	0.45	1098.6	118.1	1060.9	29.3	1075.5	44.5	1058.9	61.9	1058.9	14.6	1058.9	22.5	1058.9	61.9	0.0	(Cc.)
NIST	25	69	0.4	0.07	0.00	0.18	0.01	1.79	0.12	0.44	1023.6	120.7	1048.7	29.1	1042.8	44.1	1049.5	60.5	1049.5	14.5	1049.5	22.0	1049.5	60.5	0.0	(Cc.)
NIST	26	72	0.4	0.07	0.00	0.18	0.01	1.85	0.12	0.45	1045.9	119.3	1070.3	29.5	1064.5	44.4	1071.1	59.9	1071.1	14.8	1071.1	22.1	1071.1	59.9	0.0	(Cc.)
91500	25	71	0.4	0.07	0.00	0.18	0.01	1.86	0.12	0.44	1052.3	118.6	1072.3	29.4	1067.9	44.3	1072.9	59.9	1072.9	14.7	1072.9	22.1	1072.9	59.9	0.0	(Cc.)
91500	26	71	0.4	0.08	0.00	0.18	0.01	1.93	0.13	0.45	1158.4	116.2	1056.4	29.2	1092.4	44.6	1051.4	63.6	1051.4	14.5	1051.4	22.8	1051.4	63.6	0.0	(Cc.)
91500	26	72	0.4	0.08	0.00	0.18	0.01	1.88	0.13	0.45	1078.4	119.4	1069.6	29.7	1074.7	44.8	1068.9	61.2	1068.9	14.8	1068.9	22.5	1068.9	61.2	0.0	(Cc.)

Legend:

Dated Zircon Grains < 1.0 Ga

	Dated Zircon Grains > 1.0 Ga
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Notes:

- n = 82
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age})/(^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

B.3 Yuubetsu Formation (ST11YU4)

U-Pb LA-ICP-MS Detrital Zircon Data of Yuubetsu Formation

Sample Location: Station-11, Shiranuka-hill Area, Eastern Hokkaido, Japan

Formation / Group: Yuubetsu Formation / Urahoro Group

Belt: Nemuro Belt

Sample Type: Sandstone (medium sandstone)

Grain Number	Th (PPM)	U (PPM)	Th/U	Isotopic Ratios							U-Pb Age (Ma)										Preferr ed Age	± 2σ	Disc. (%)			
											before Stacey-Kramers Correction					after Stacey-Kramers Correction										
				207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	Error Corr.	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ				207Pb/ 235U	± 2σ	
ST11YU4-1	132	344	0.4	0.06	0.01	0.01	0.00	0.08	0.01	0.47	485.0	265.8	61.0	3.6	73.7	8.9	60.2	161.0	60.2	1.8	60.2	4.3	60.2	1.8	0.0	(Cc.)
ST11YU4-2	114	211	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.42	251.9	401.1	55.2	4.0	60.5	10.2	54.9	206.4	54.9	2.0	54.9	5.0	54.9	2.0	0.0	(Cc.)
ST11YU4-3	199	283	0.7	0.08	0.01	0.01	0.00	0.11	0.01	0.53	1133.2	216.3	68.3	4.1	110.5	12.0	65.6	191.3	65.6	1.9	65.6	5.4	65.6	1.9	0.0	(Cc.)
ST11YU4-4	141	250	0.6	0.17	0.01	0.01	0.00	0.32	0.03	0.67	2576.5	142.9	85.2	5.2	280.9	22.5	71.7	296.8	71.7	1.9	71.7	8.8	71.7	1.9	0.0	(Cc.)
ST11YU4-5	119	248	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.43	156.3	339.6	66.8	4.2	70.0	10.0	66.6	166.7	66.6	2.1	66.6	5.0	66.6	2.1	0.0	(Cc.)
ST11YU4-6	205	327	0.6	0.05	0.01	0.01	0.00	0.05	0.01	0.42	54.0	352.0	50.3	3.2	50.9	7.5	50.3	164.5	50.3	1.6	50.3	3.7	50.3	1.6	0.0	(Cc.)
ST11YU4-9	87	160	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.42	409.1	429.1	55.8	4.4	65.4	11.9	55.2	240.0	55.2	2.2	55.2	5.8	55.2	2.2	0.0	(Cc.)
ST11YU4-11	117	234	0.5	0.06	0.01	0.01	0.00	0.07	0.01	0.45	417.5	332.7	61.3	4.1	71.9	10.4	60.6	189.2	60.6	2.0	60.6	5.1	60.6	2.0	0.0	(Cc.)
OD3	252	265	1.0	0.04	0.01	0.01	0.00	0.03	0.01	0.38	-84.0	499.0	34.2	2.6	32.9	6.5	34.2	214.2	34.2	1.3	34.2	3.3	34.2	1.3	0.0	(Cc.)
GJ1	18	349	0.1	0.06	0.00	0.10	0.00	0.81	0.06	0.58	594.0	101.7	596.0	23.9	600.3	32.8	595.5	64.7	595.5	11.9	595.5	16.4	595.5	11.9	0.0	(Cc.)
NIST	25	73	0.3	0.07	0.00	0.18	0.01	1.85	0.15	0.60	1008.0	119.2	1079.2	48.7	1062.8	53.6	1081.6	63.5	1081.6	24.5	1081.6	26.7	1081.6	63.5	0.0	(Cc.)
NIST	26	76	0.3	0.07	0.00	0.18	0.01	1.79	0.15	0.60	999.5	122.5	1052.7	48.1	1042.4	53.7	1054.2	65.3	1054.2	24.1	1054.2	26.8	1054.2	65.3	0.0	(Cc.)
NIST	25	74	0.3	0.08	0.00	0.17	0.01	1.88	0.15	0.61	1140.6	117.5	1032.5	47.1	1074.8	54.0	1026.7	70.1	1026.7	23.3	1026.7	27.4	1026.7	70.1	0.0	(Cc.)
91500	26	77	0.3	0.08	0.00	0.18	0.01	1.96	0.16	0.61	1126.1	115.7	1077.6	48.7	1100.8	54.4	1074.3	66.9	1074.3	24.2	1074.3	27.4	1074.3	66.9	0.0	(Cc.)
91500	25	69	0.4	0.08	0.00	0.18	0.01	1.90	0.16	0.60	1071.5	118.7	1077.5	49.0	1082.5	54.3	1076.8	65.8	1076.8	24.4	1076.8	27.2	1076.8	65.8	0.0	(Cc.)
91500	24	71	0.3	0.07	0.00	0.18	0.01	1.82	0.15	0.60	1022.6	121.8	1058.6	48.4	1053.9	54.0	1059.3	65.7	1059.3	24.2	1059.3	27.0	1059.3	65.7	0.0	(Cc.)
ST11YU4-14	79	169	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.35	72.2	464.5	56.2	3.9	56.9	11.0	56.2	224.0	56.2	2.0	56.2	5.5	56.2	2.0	0.0	(Cc.)
ST11YU4-15	168	409	0.4	0.10	0.01	0.03	0.00	0.38	0.03	0.37	1618.2	99.1	175.5	5.6	328.4	24.3	164.0	191.0	164.4	2.5	164.4	12.6	164.4	2.5	0.0	(Cc.)
ST11YU4-16	72	182	0.4	0.07	0.01	0.01	0.00	0.09	0.01	0.45	1054.7	305.8	55.9	3.9	87.6	13.1	54.0	264.2	54.0	1.8	54.0	6.1	54.0	1.8	0.0	(Cc.)
ST11YU4-17	81	173	0.5	0.07	0.01	0.01	0.00	0.09	0.01	0.43	1045.4	330.9	53.2	3.8	83.1	13.3	51.3	284.2	51.3	1.8	51.3	6.2	51.3	1.8	0.0	(Cc.)

ST11YU4-21	52	128	0.4	0.09	0.02	0.01	0.00	0.13	0.02	0.48	1471.6	317.9	66.1	5.3	125.7	19.7	62.3	342.2	62.3	2.3	62.3	9.0	62.3	2.3	0.0	(Cc.)
ST11YU4-23	75	209	0.4	0.06	0.01	0.01	0.00	0.09	0.01	0.40	719.8	297.4	66.6	3.9	88.8	12.6	65.3	218.2	65.3	1.9	65.3	6.1	65.3	1.9	0.0	(Cc.)
ST11YU4-24	124	230	0.5	0.07	0.01	0.01	0.00	0.09	0.01	0.42	959.4	283.9	55.4	3.4	82.9	11.7	53.7	241.0	53.7	1.6	53.7	5.5	53.7	1.6	0.0	(Cc.)
ST11YU4-25	282	410	0.7	0.06	0.01	0.01	0.00	0.05	0.01	0.37	415.5	277.2	45.7	2.3	53.8	7.1	45.2	178.9	45.2	1.1	45.2	3.5	45.2	1.1	0.0	(Cc.)
ST11YU4-26	57	186	0.3	0.03	0.01	0.01	0.00	0.04	0.01	0.18	1140.9	1036.4	66.3	4.2	43.0	14.4	66.3	256.5	66.3	2.1	66.3	7.2	66.3	2.1	0.0	(Cc.)
OD3	504	472	1.1	0.05	0.01	0.01	0.00	0.04	0.01	0.37	354.0	307.3	32.8	1.8	37.9	5.4	32.5	188.1	32.5	0.9	32.5	2.7	32.5	0.9	0.0	(Cc.)
GJ1	18	353	0.1	0.06	0.00	0.10	0.00	0.81	0.07	0.32	613.1	85.3	592.6	14.6	599.9	36.9	591.9	85.2	591.9	7.3	591.9	18.5	591.9	7.3	0.0	(Cc.)
NIST	26	78	0.3	0.08	0.00	0.18	0.01	1.94	0.17	0.41	1124.0	104.7	1075.0	36.0	1095.8	59.8	1072.1	84.5	1072.1	17.9	1072.1	30.3	1072.1	84.5	0.0	(Cc.)
NIST	25	70	0.4	0.08	0.00	0.18	0.01	1.89	0.17	0.41	1069.4	107.7	1074.9	36.3	1077.5	59.7	1074.6	82.7	1074.6	18.2	1074.6	29.9	1074.6	82.7	0.0	(Cc.)
NIST	24	71	0.3	0.07	0.00	0.18	0.01	1.81	0.16	0.41	1020.6	110.9	1056.1	36.0	1049.0	59.2	1057.1	82.2	1057.1	18.0	1057.1	29.5	1057.1	82.2	0.0	(Cc.)
91500	25	73	0.3	0.07	0.00	0.18	0.01	1.77	0.16	0.40	971.1	110.1	1056.5	35.3	1033.4	58.4	1060.0	79.9	1060.0	17.8	1060.0	28.7	1060.0	79.9	0.0	(Cc.)
91500	24	70	0.4	0.08	0.00	0.18	0.01	1.93	0.17	0.41	1147.4	105.0	1058.4	35.7	1092.4	59.8	1053.7	86.6	1053.7	17.7	1053.7	30.6	1053.7	86.6	0.0	(Cc.)
91500	25	73	0.3	0.08	0.00	0.18	0.01	1.87	0.17	0.41	1079.6	107.4	1057.2	35.7	1068.9	59.3	1055.6	84.1	1055.6	17.8	1055.6	29.9	1055.6	84.1	0.0	(Cc.)
ST11YU4-27	240	354	0.7	0.05	0.01	0.01	0.00	0.06	0.01	0.40	293.2	314.6	53.2	3.3	59.7	8.8	52.8	187.2	52.8	1.6	52.8	4.3	52.8	1.6	0.0	(Cc.)
ST11YU4-28	46	102	0.5	0.39	0.03	0.02	0.00	1.09	0.11	0.69	3860.9	113.7	128.0	8.6	748.0	51.8	72.3	699.0	72.4	1.4	72.3	20.6	72.4	1.4	-0.1	(Cc.)
ST11YU4-29	63	53	1.2	0.12	0.00	0.35	0.02	5.65	0.52	0.53	1896.7	73.1	1922.2	81.6	1924.2	79.9	1921.7	70.6	1921.7	40.8	1921.7	40.0	1921.7	70.6	0.0	(Cc.)
ST11YU4-30	238	402	0.6	0.05	0.01	0.01	0.00	0.05	0.01	0.40	180.5	314.5	47.0	2.8	50.5	7.4	46.8	177.2	46.8	1.4	46.8	3.7	46.8	1.4	0.0	(Cc.)
ST11YU4-31	187	507	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.41	299.2	269.6	50.1	2.8	56.5	7.5	49.7	168.8	49.7	1.4	49.7	3.7	49.7	1.4	0.0	(Cc.)
ST11YU4-32	268	530	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.40	33.6	270.5	58.8	3.1	59.1	7.7	58.8	147.0	58.8	1.6	58.8	3.8	58.8	1.6	0.0	(Cc.)
ST11YU4-33	76	167	0.5	0.06	0.01	0.01	0.00	0.07	0.01	0.41	509.0	433.8	54.8	4.5	67.6	13.2	54.1	272.1	54.1	2.2	54.1	6.4	54.1	2.2	0.0	(Cc.)
ST11YU4-34	123	174	0.7	0.07	0.01	0.01	0.00	0.09	0.02	0.46	1020.1	323.5	57.5	4.4	89.4	14.3	55.5	279.9	55.5	2.0	55.5	6.7	55.5	2.0	0.0	(Cc.)
ST11YU4-35	273	586	0.5	0.06	0.00	0.01	0.00	0.08	0.01	0.43	428.4	194.3	66.2	3.2	78.3	8.6	65.4	146.7	65.4	1.6	65.4	4.2	65.4	1.6	0.0	(Cc.)
ST11YU4-36	123	192	0.6	0.06	0.01	0.01	0.00	0.07	0.01	0.41	504.1	381.9	54.8	4.1	67.4	11.8	54.0	243.4	54.0	2.0	54.0	5.7	54.0	2.0	0.0	(Cc.)
ST11YU4-37	172	392	0.4	0.05	0.01	0.01	0.00	0.07	0.01	0.41	226.1	269.0	66.2	3.6	71.9	9.4	65.9	160.8	65.9	1.8	65.9	4.7	65.9	1.8	0.0	(Cc.)
ST11YU4-38	125	179	0.7	0.05	0.01	0.01	0.00	0.06	0.01	0.40	407.4	440.6	51.8	4.2	61.2	12.0	51.3	261.0	51.3	2.0	51.3	5.8	51.3	2.0	0.0	(Cc.)
OD3	585	579	1.0	0.05	0.01	0.00	0.00	0.04	0.01	0.41	344.7	283.1	31.5	1.8	36.5	5.1	31.2	180.6	31.2	0.9	31.2	2.5	31.2	0.9	0.0	(Cc.)
GJ1	18	358	0.1	0.06	0.00	0.10	0.00	0.81	0.07	0.44	599.9	82.7	591.6	22.2	600.8	40.3	590.7	88.2	590.7	11.1	590.7	20.2	590.7	11.1	0.0	(Cc.)
NIST	25	73	0.3	0.07	0.00	0.18	0.01	1.78	0.17	0.48	970.7	107.8	1054.1	45.5	1038.0	62.8	1056.4	82.9	1056.4	22.8	1056.4	31.1	1056.4	82.9	0.0	(Cc.)
NIST	24	70	0.3	0.08	0.00	0.18	0.01	1.95	0.19	0.49	1147.1	102.8	1056.0	45.8	1097.2	64.4	1050.2	90.0	1050.2	22.7	1050.2	33.0	1050.2	90.0	0.0	(Cc.)
NIST	25	73	0.3	0.08	0.00	0.18	0.01	1.88	0.18	0.49	1079.2	105.1	1054.8	45.8	1073.7	63.9	1052.1	87.3	1052.1	22.8	1052.1	32.3	1052.1	87.3	0.0	(Cc.)

91500	26	73	0.3	0.07	0.00	0.19	0.01	1.90	0.18	0.49	1017.4	106.8	1097.9	47.6	1082.2	64.3	1100.2	82.3	1100.2	23.9	1100.2	31.9	1100.2	82.3	0.0	(Cc.)
91500	24	74	0.3	0.08	0.00	0.18	0.01	1.93	0.19	0.49	1127.0	103.3	1057.8	45.9	1091.7	64.3	1053.0	89.0	1053.0	22.8	1053.0	32.8	1053.0	89.0	0.0	(Cc.)
91500	25	78	0.3	0.07	0.00	0.18	0.01	1.77	0.17	0.49	950.3	110.6	1057.6	46.0	1033.9	63.1	1061.1	82.4	1061.1	23.2	1061.1	31.1	1061.1	82.4	0.0	(Cc.)
ST11YU4-40	111	222	0.5	0.06	0.01	0.01	0.00	0.07	0.01	0.51	629.9	349.2	52.0	4.3	67.5	10.6	51.0	218.8	51.0	2.1	51.0	5.0	51.0	2.1	0.0	(Cc.)
ST11YU4-42	92	186	0.5	0.05	0.01	0.03	0.00	0.18	0.02	0.58	208.8	244.2	166.9	11.2	171.9	18.6	167.0	116.0	166.6	5.6	166.6	9.2	166.6	5.6	0.0	(Cc.)
ST11YU4-44	143	251	0.6	0.06	0.01	0.01	0.00	0.07	0.01	0.52	532.7	324.1	57.8	4.5	71.7	10.5	57.0	192.5	57.0	2.2	57.0	5.0	57.0	2.2	0.0	(Cc.)
ST11YU4-45	60	148	0.4	0.06	0.01	0.01	0.00	0.07	0.01	0.50	506.6	400.4	58.8	5.3	72.0	12.5	58.0	228.8	58.0	2.6	58.0	6.0	58.0	2.6	0.0	(Cc.)
ST11YU4-46	76	157	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.49	369.4	436.1	53.3	4.9	61.7	11.4	52.8	231.3	52.8	2.4	52.8	5.5	52.8	2.4	0.0	(Cc.)
ST11YU4-48	218	396	0.6	0.07	0.01	0.01	0.00	0.07	0.01	0.58	874.1	246.0	46.4	3.4	67.7	8.2	45.1	179.9	45.1	1.6	45.1	3.7	45.1*	1.6*	0.0	(Cc.)
ST11YU4-50	2453	2678	0.9	0.06	0.00	0.01	0.00	0.09	0.01	0.77	470.3	95.4	71.4	4.0	85.6	6.1	70.6	68.7	70.6	2.0	70.6	2.8	70.6	2.0	0.0	(Cc.)
ST11YU4-51	101	275	0.4	0.04	0.01	0.01	0.00	0.06	0.01	0.49	-195.7	363.7	68.8	5.0	62.8	9.2	68.8	143.3	68.8	2.5	68.8	4.7	68.8	2.5	0.0	(Cc.)
ST11YU4-52	77	212	0.4	0.06	0.01	0.01	0.00	0.09	0.01	0.53	570.8	316.6	67.1	5.3	84.3	12.1	66.1	190.6	66.1	2.6	66.1	5.7	66.1	2.6	0.0	(Cc.)
OD3	580	505	1.1	0.07	0.01	0.01	0.00	0.05	0.01	0.59	865.1	237.8	36.3	2.6	53.0	6.3	35.3	174.5	35.3	1.2	35.3	2.8	35.3	1.2	0.0	(Cc.)
GJ1	19	367	0.1	0.06	0.00	0.09	0.01	0.79	0.06	0.78	610.8	91.3	579.6	32.1	592.3	33.5	578.4	52.7	578.4	16.0	578.4	16.6	578.4	16.0	0.0	(Cc.)
NIST	26	74	0.3	0.07	0.00	0.19	0.01	1.92	0.16	0.76	1022.1	112.7	1107.5	64.6	1088.5	55.9	1110.4	53.0	1110.4	32.4	1110.4	28.0	1110.4	53.0	0.0	(Cc.)
NIST	24	74	0.3	0.08	0.00	0.18	0.01	1.95	0.16	0.76	1131.7	109.2	1067.1	62.4	1098.0	55.8	1062.7	56.7	1062.7	30.9	1062.7	27.9	1062.7	56.7	0.0	(Cc.)
NIST	26	78	0.3	0.07	0.00	0.18	0.01	1.78	0.15	0.75	955.1	116.4	1066.9	62.4	1040.0	55.0	1070.9	53.6	1070.9	31.5	1070.9	27.5	1070.9	53.6	0.0	(Cc.)
91500	27	80	0.3	0.07	0.00	0.18	0.01	1.82	0.15	0.75	996.1	113.9	1066.7	62.3	1053.0	55.0	1068.6	54.1	1068.6	31.2	1068.6	27.5	1068.6	54.1	0.0	(Cc.)
91500	25	76	0.3	0.08	0.00	0.17	0.01	1.85	0.15	0.76	1083.8	111.2	1039.4	60.8	1063.1	55.0	1036.1	57.0	1036.1	30.2	1036.1	27.5	1036.1	57.0	0.0	(Cc.)
91500	27	78	0.3	0.08	0.00	0.17	0.01	1.88	0.16	0.76	1137.9	110.6	1030.5	60.5	1074.9	55.3	1024.4	58.8	1024.4	29.9	1024.4	27.7	1024.4	58.8	0.0	(Cc.)
ST11YU4-54	75	178	0.4	0.23	0.02	0.01	0.00	0.40	0.04	0.76	3085.5	167.2	80.1	6.6	344.2	31.7	61.3	414.5	61.3	1.9	61.3	10.5	61.3	1.9	-0.1	(Cc.)
ST11YU4-55	472	1006	0.5	0.41	0.02	0.01	0.00	0.77	0.06	0.71	3950.2	66.4	87.2	4.8	579.4	34.3	47.4	567.9	47.4	0.7	47.4	11.0	47.4	0.7	0.0	(Cc.)
ST11YU4-59	84	188	0.4	0.07	0.01	0.01	0.00	0.15	0.02	0.55	1060.5	240.6	92.4	6.5	140.2	17.0	89.3	200.2	89.3	3.0	89.3	7.8	89.3	3.0	0.0	(Cc.)
ST11YU4-60	167	252	0.7	0.06	0.01	0.04	0.00	0.29	0.03	0.56	543.3	197.2	229.2	13.7	258.7	25.0	227.0	120.0	227.2	6.7	227.1	12.3	227.2	6.7	0.0	(Cc.)
ST11YU4-61	1920	1166	1.6	0.05	0.00	0.01	0.00	0.06	0.01	0.56	239.3	175.9	53.1	2.9	57.1	5.5	52.8	106.1	52.8	1.5	52.8	2.7	52.8	1.5	0.0	(Cc.)
ST11YU4-62	62	324	0.2	0.06	0.01	0.01	0.00	0.07	0.01	0.50	556.4	293.0	52.0	3.7	64.3	8.9	51.3	184.0	51.3	1.8	51.3	4.2	51.3	1.8	0.0	(Cc.)
ST11YU4-63	88	146	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.45	269.1	460.7	54.2	4.8	59.1	11.5	53.9	232.7	53.9	2.4	53.9	5.6	53.9	2.4	0.0	(Cc.)
ST11YU4-65	464	480	1.0	0.12	0.01	0.01	0.00	0.15	0.01	0.64	1916.9	135.9	60.2	3.7	143.1	12.8	54.9	219.6	55.0	1.5	55.0	5.1	55.0	1.5	0.0	(Cc.)
OD3	764	599	1.3	0.05	0.01	0.00	0.00	0.04	0.00	0.50	403.1	272.5	31.3	2.1	36.5	4.8	31.0	160.5	31.0	1.0	31.0	2.3	31.0	1.0	0.0	(Cc.)
GJ1	18	358	0.0	0.06	0.00	0.10	0.01	0.82	0.07	0.63	647.4	99.3	600.5	29.8	608.6	37.5	599.7	69.9	599.7	14.9	599.7	18.8	599.7	14.9	0.0	(Cc.)
NIST	27	78	0.3	0.07	0.00	0.18	0.01	1.81	0.16	0.64	1008.6	119.4	1070.9	57.2	1048.1	59.1	1074.3	67.1	1074.3	28.8	1074.3	29.4	1074.3	67.1	0.0	(Cc.)

NIST	25	74	0.3	0.08	0.00	0.18	0.01	1.84	0.16	0.64	1096.2	116.6	1043.5	55.8	1058.1	59.1	1041.5	71.0	1041.5	27.8	1041.5	29.7	1041.5	71.0	0.0	(Cc.)
NIST	26	75	0.3	0.08	0.00	0.17	0.01	1.87	0.17	0.65	1150.2	115.9	1034.6	55.6	1069.9	59.5	1029.8	73.4	1029.8	27.5	1029.8	30.0	1029.8	73.4	0.0	(Cc.)
91500	27	79	0.3	0.08	0.00	0.18	0.01	1.92	0.17	0.65	1129.9	112.6	1070.6	56.8	1087.7	59.3	1068.2	69.9	1068.2	28.3	1068.2	29.8	1068.2	69.9	0.0	(Cc.)
91500	24	71	0.3	0.08	0.00	0.19	0.01	1.98	0.18	0.65	1127.0	115.9	1101.8	58.9	1107.7	60.7	1101.0	69.3	1101.0	29.4	1101.0	30.4	1101.0	69.3	0.0	(Cc.)
91500	25	75	0.3	0.07	0.00	0.18	0.01	1.80	0.16	0.64	1030.3	118.2	1056.5	56.4	1045.4	58.8	1058.1	68.3	1058.1	28.3	1058.1	29.3	1058.1	68.3	0.0	(Cc.)
ST11YU4-68	61	155	0.4	0.06	0.01	0.01	0.00	0.08	0.01	0.50	534.1	377.8	63.0	5.5	76.8	13.0	62.2	223.1	62.2	2.7	62.2	6.2	62.2	2.7	0.0	(Cc.)
ST11YU4-70	118	914	0.1	0.12	0.01	0.01	0.00	0.16	0.01	0.68	1961.8	117.3	62.1	3.9	150.9	13.1	56.4	207.1	56.4	1.6	56.4	5.0	56.4	1.6	0.0	(Cc.)
ST11YU4-71	577	1156	0.5	0.07	0.01	0.01	0.00	0.11	0.01	0.60	891.3	187.0	73.5	4.9	104.5	11.0	71.5	152.4	71.5	2.3	71.5	5.0	71.5	2.3	0.0	(Cc.)
ST11YU4-74	97	158	0.6	0.08	0.01	0.01	0.00	0.10	0.02	0.55	1232.7	312.6	60.0	5.3	101.2	15.6	57.4	279.0	57.4	2.4	57.4	7.0	57.4	2.4	0.0	(Cc.)
ST11YU4-75	295	619	0.5	0.05	0.00	0.01	0.00	0.07	0.01	0.56	109.0	226.3	67.6	4.4	68.6	7.7	67.5	116.6	67.5	2.2	67.5	3.8	67.5	2.2	0.0	(Cc.)
ST11YU4-76	286	321	0.9	0.04	0.01	0.01	0.00	0.05	0.01	0.46	-121.4	376.2	53.3	4.0	49.6	7.8	53.3	158.9	53.3	2.0	53.3	4.0	53.3	2.0	0.0	(Cc.)
ST11YU4-77	262	339	0.8	0.05	0.01	0.01	0.00	0.06	0.01	0.51	402.9	303.6	51.5	3.8	59.6	8.5	51.0	174.6	51.0	1.9	51.0	4.1	51.0	1.9	0.0	(Cc.)
ST11YU4-78	209	439	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.55	249.5	248.6	64.8	4.4	69.8	8.4	64.5	134.5	64.5	2.2	64.5	4.1	64.5	2.2	0.0	(Cc.)
OD3	808	630	1.3	0.06	0.01	0.01	0.00	0.04	0.01	0.56	666.6	234.2	33.6	2.3	44.1	5.4	32.9	163.2	32.9	1.1	32.9	2.5	32.9	1.1	0.0	(Cc.)
GJ1	19	364	0.1	0.06	0.00	0.10	0.01	0.81	0.07	0.68	655.7	96.9	590.8	32.9	603.5	38.7	589.6	69.3	589.6	16.4	589.6	19.3	589.6	16.4	0.0	(Cc.)
NIST	27	77	0.3	0.08	0.00	0.18	0.01	1.92	0.18	0.69	1134.5	111.4	1064.9	62.2	1086.6	61.3	1061.8	69.4	1061.8	30.9	1061.8	30.8	1061.8	69.4	0.0	(Cc.)
NIST	23	69	0.3	0.08	0.00	0.19	0.01	1.97	0.18	0.69	1131.6	114.8	1095.9	64.4	1106.6	62.7	1094.4	68.9	1094.4	32.1	1094.4	31.4	1094.4	68.9	0.0	(Cc.)
NIST	25	74	0.3	0.07	0.00	0.18	0.01	1.80	0.17	0.68	1034.9	117.0	1050.8	61.7	1044.3	60.8	1051.7	67.8	1051.7	30.9	1051.7	30.3	1051.7	67.8	0.0	(Cc.)
91500	25	74	0.3	0.07	0.00	0.18	0.01	1.78	0.17	0.68	1035.0	117.1	1042.9	61.3	1039.0	60.6	1043.4	68.2	1043.4	30.7	1043.4	30.3	1043.4	68.2	0.0	(Cc.)
91500	25	71	0.4	0.07	0.00	0.18	0.01	1.89	0.18	0.69	1043.8	115.7	1093.8	64.1	1075.8	61.6	1096.5	65.8	1096.5	32.2	1096.5	30.7	1096.5	65.8	0.0	(Cc.)
91500	24	72	0.3	0.08	0.00	0.17	0.01	1.85	0.17	0.69	1140.8	114.1	1029.6	60.6	1064.5	61.2	1024.8	72.1	1024.8	30.0	1024.8	30.8	1024.8	72.1	0.0	(Cc.)
ST11YU4-81	37	758	0.0	0.12	0.01	0.01	0.00	0.20	0.01	0.84	1966.7	119.5	78.0	4.3	187.9	11.2	70.8	105.7	70.8	1.8	70.8	3.5	70.8	1.8	0.0	(Cc.)
ST11YU4-83	52	108	0.5	0.05	0.01	0.01	0.00	0.06	0.02	0.39	12.6	631.9	60.7	5.9	59.7	14.5	60.9	270.5	60.9	3.0	60.9	7.3	60.9	3.0	0.0	(Cc.)
ST11YU4-84	105	208	0.5	0.10	0.01	0.01	0.00	0.11	0.01	0.64	1682.6	249.3	50.5	4.0	108.1	12.6	46.9	247.4	47.0	1.7	47.0	5.0	47.0	1.7	0.0	(Cc.)
ST11YU4-85	105	240	0.4	0.08	0.01	0.04	0.00	0.52	0.04	0.80	1307.0	134.7	282.3	15.2	427.6	24.1	270.8	78.7	270.8	7.0	270.8	10.3	270.8	7.0	0.0	(Cc.)
ST11YU4-86	173	345	0.5	0.07	0.01	0.01	0.00	0.08	0.01	0.59	916.2	253.0	54.2	3.7	79.4	8.8	52.7	165.9	52.7	1.7	52.7	4.0	52.7	1.7	0.0	(Cc.)
ST11YU4-87	104	284	0.4	0.05	0.01	0.01	0.00	0.08	0.01	0.52	378.5	313.3	65.0	4.5	74.3	9.5	64.4	155.1	64.4	2.2	64.4	4.6	64.4	2.2	0.0	(Cc.)
ST11YU4-88	129	289	0.4	0.06	0.01	0.01	0.00	0.06	0.01	0.51	444.5	347.2	45.9	3.4	54.5	7.8	45.4	180.3	45.4	1.7	45.4	3.7	45.4	1.7	0.0	(Cc.)
ST11YU4-89	65	104	0.6	0.11	0.02	0.01	0.00	0.17	0.02	0.64	1751.2	302.9	72.0	6.8	156.2	21.4	66.5	307.8	66.5	2.9	66.5	8.8	66.5	2.9	0.0	(Cc.)
ST11YU4-90	247	138	1.8	0.06	0.01	0.05	0.00	0.43	0.04	0.66	496.8	197.8	340.8	19.5	362.4	27.0	339.2	80.8	339.2	9.6	339.2	13.3	339.2	9.6	0.0	(Cc.)
ST11YU4-91	111	154	0.7	0.05	0.01	0.01	0.00	0.07	0.01	0.43	50.4	475.0	66.8	5.5	66.5	12.2	66.8	202.9	66.8	2.7	66.8	6.1	66.8	2.7	0.0	(Cc.)

OD3	574	507	1.1	0.06	0.01	0.01	0.00	0.05	0.01	0.55	634.7	281.6	34.6	2.3	45.0	5.4	34.0	161.9	34.0	1.1	34.0	2.5	34.0	1.1	0.0	(Cc.)
GJ1	18	347	0.1	0.06	0.00	0.10	0.00	0.79	0.05	0.86	534.7	123.0	601.6	29.1	589.0	26.3	603.0	31.6	603.0	14.6	603.0	13.3	603.0	14.6	0.0	(Cc.)
NIST	25	75	0.3	0.07	0.00	0.18	0.01	1.81	0.13	0.82	1027.4	134.4	1055.7	55.2	1048.3	45.4	1056.7	40.0	1056.7	27.7	1056.7	22.7	1056.7	40.0	0.0	(Cc.)
NIST	26	72	0.4	0.07	0.00	0.19	0.01	1.91	0.13	0.82	1036.3	133.1	1107.1	57.7	1085.3	46.1	1110.5	38.2	1110.5	29.0	1110.5	23.1	1110.5	38.2	0.0	(Cc.)
NIST	24	72	0.3	0.08	0.01	0.18	0.01	1.88	0.13	0.82	1133.3	131.3	1042.3	54.6	1073.9	45.7	1037.9	41.7	1037.9	27.1	1037.9	22.7	1037.9	41.7	0.0	(Cc.)
91500	26	75	0.4	0.08	0.01	0.18	0.01	1.89	0.13	0.82	1090.4	132.7	1068.2	55.9	1077.3	46.0	1066.9	40.6	1066.9	27.9	1066.9	23.0	1066.9	40.6	0.0	(Cc.)
91500	26	74	0.4	0.08	0.01	0.18	0.01	1.90	0.13	0.82	1135.4	132.5	1051.4	55.3	1080.9	46.3	1047.3	42.2	1047.3	27.5	1047.3	23.0	1047.3	42.2	0.0	(Cc.)
91500	27	77	0.3	0.07	0.00	0.18	0.01	1.82	0.13	0.81	1044.1	134.4	1053.3	55.1	1052.1	45.6	1053.5	40.6	1053.5	27.6	1053.5	22.8	1053.5	40.6	0.0	(Cc.)
ST11YU4-93	39	81	0.5	0.06	0.02	0.01	0.00	0.08	0.02	0.42	705.3	509.4	62.9	5.9	82.6	17.7	61.6	320.4	61.6	2.9	61.6	8.5	61.6	2.9	0.0	(Cc.)
ST11YU4-94	226	492	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.43	214.6	245.2	67.9	2.9	72.0	7.1	67.7	116.0	67.7	1.5	67.7	3.5	67.7	1.5	0.0	(Cc.)
ST11YU4-95	206	396	0.5	0.07	0.01	0.01	0.00	0.11	0.01	0.47	859.3	211.7	74.6	3.4	104.4	9.6	72.7	143.9	72.7	1.6	72.7	4.5	72.7	1.6	0.0	(Cc.)
ST11YU4-97	164	276	0.6	0.13	0.01	0.01	0.00	0.24	0.02	0.63	2160.1	185.5	82.5	4.9	217.2	18.6	73.5	248.6	73.5	1.9	73.5	7.7	73.5	1.9	0.0	(Cc.)
ST11YU4-99	264	448	0.6	0.05	0.01	0.01	0.00	0.08	0.01	0.43	243.3	242.2	69.5	3.0	74.5	7.2	69.2	116.3	69.2	1.5	69.2	3.6	69.2	1.5	0.0	(Cc.)
ST11YU4-100	73	189	0.4	0.08	0.01	0.01	0.00	0.13	0.02	0.51	1305.0	270.2	71.9	4.7	124.4	15.0	68.5	232.8	68.5	2.1	68.5	6.8	68.5	2.1	0.0	(Cc.)
ST11YU4-101	125	191	0.7	0.22	0.02	0.01	0.00	0.40	0.03	0.73	3008.7	137.6	82.5	4.4	339.1	21.5	64.3	287.2	64.3	1.4	64.3	7.6	64.3	1.4	0.0	(Cc.)
ST11YU4-102	139	295	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.41	233.2	305.0	65.5	3.4	70.0	8.5	65.2	146.0	65.2	1.7	65.2	4.2	65.2	1.7	0.0	(Cc.)
ST11YU4-103	141	337	0.4	0.06	0.01	0.01	0.00	0.08	0.01	0.44	539.4	258.4	65.5	3.2	79.8	8.6	64.6	146.6	64.6	1.6	64.6	4.2	64.6	1.6	0.0	(Cc.)
ST11YU4-104	234	484	0.5	0.06	0.01	0.01	0.00	0.07	0.01	0.44	449.1	238.6	60.1	2.7	70.6	7.0	59.4	129.3	59.4	1.3	59.4	3.4	59.4	1.3	0.0	(Cc.)
OD3	537	470	1.1	0.08	0.01	0.01	0.00	0.06	0.01	0.50	1245.0	215.3	36.2	1.8	62.4	6.2	34.6	185.2	34.6	0.8	34.6	2.8	34.6	0.8	0.0	(Cc.)
GJ1	18	351	0.1	0.06	0.00	0.10	0.00	0.82	0.04	0.53	609.8	113.1	607.7	16.7	606.8	24.7	607.7	49.4	607.7	8.4	607.7	12.3	607.7	8.4	0.0	(Cc.)
NIST	25	71	0.4	0.08	0.00	0.18	0.01	1.87	0.12	0.59	1082.8	129.7	1066.6	38.5	1070.0	44.2	1066.1	54.7	1066.1	19.2	1066.1	22.1	1066.1	54.7	0.0	(Cc.)
NIST	25	71	0.4	0.08	0.01	0.18	0.01	1.88	0.13	0.59	1127.8	129.6	1049.8	38.3	1073.5	44.5	1046.5	56.8	1046.5	19.0	1046.5	22.4	1046.5	56.8	0.0	(Cc.)
NIST	26	73	0.4	0.07	0.00	0.18	0.01	1.80	0.12	0.58	1036.4	131.4	1051.7	37.9	1044.8	43.8	1052.7	54.4	1052.7	19.0	1052.7	21.8	1052.7	54.4	0.0	(Cc.)
91500	26	77	0.3	0.08	0.00	0.18	0.01	1.92	0.12	0.59	1151.8	122.9	1061.3	36.9	1089.4	42.8	1057.4	54.5	1057.4	18.3	1057.4	21.6	1057.4	54.5	0.0	(Cc.)
91500	26	76	0.3	0.07	0.00	0.18	0.01	1.87	0.12	0.58	1051.5	126.0	1080.9	37.6	1069.3	42.8	1082.6	51.8	1082.6	18.8	1082.6	21.3	1082.6	51.8	0.0	(Cc.)
91500	26	75	0.4	0.08	0.00	0.18	0.01	1.87	0.12	0.58	1083.1	126.0	1067.8	37.3	1070.9	43.0	1067.4	53.3	1067.4	18.6	1067.4	21.5	1067.4	53.3	0.0	(Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

▪ n = 74

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- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
 - *) = YSG Age (Youngest Single Grain)
 - Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age})/(^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
 - This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

B.4 Tenneru Formation (ST6TN1)

U-Pb LA-ICP-MS Detrital Zircon Data of Tenneru Formation																													
Sample Location: Station-6, Akkeshi Bay Area, Eastern Hokkaido, Japan																													
Formation / Group: Tenneru Formation / Urahoru Group																													
Belt: Nemuro Belt																													
Sample Type: Sandstone (coarse - very coarse sandstone)																													
Grain Number	Th (PPM)	U (PPM)	Th/U	Isotopic Ratios							U-Pb Age (Ma)								U-Pb Age (Ma)								Preferred Age	± 2σ	Disc. (%)
											before Stacey-Kramers Correction								after Stacey-Kramers Correction										
				207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ	Error Corr.	207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ	207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ							
ST6TN1-2	957	1095	0.9	0.05	0.01	0.01	0.00	0.04	0.01	0.66	144.7	263.8	38.4	3.1	40.9	5.0	38.3	118.1	38.3	1.6	38.3	2.4	38.3	1.6	0.0	(Cc.)			
ST6TN1-3	488	768	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.70	285.8	237.0	55.6	4.5	62.4	7.0	55.2	111.1	55.2	2.2	55.2	3.3	55.2	2.2	0.0	(Cc.)			
ST6TN1-4	380	624	0.6	0.05	0.01	0.01	0.00	0.05	0.01	0.60	336.0	304.3	41.4	3.5	47.8	6.6	41.0	157.7	41.0	1.7	41.0	3.1	41.0	1.7	0.0	(Cc.)			
ST6TN1-5	63	118	0.5	0.06	0.02	0.01	0.00	0.07	0.02	0.42	641.5	585.1	52.0	5.8	68.3	17.7	51.0	385.0	51.0	2.8	51.0	8.5	51.0	2.8	0.0	(Cc.)			
ST6TN1-7	52	151	0.3	0.07	0.02	0.01	0.00	0.11	0.02	0.49	1066.7	443.3	69.8	7.4	110.3	22.7	67.2	363.7	67.3	3.4	67.2	10.5	67.3	3.4	-0.1	(Cc.)			
ST6TN1-8	101	171	0.6	0.07	0.01	0.01	0.00	0.08	0.02	0.50	777.9	426.2	53.1	5.4	74.1	14.4	51.8	292.8	51.8	2.6	51.8	6.7	51.8	2.6	0.0	(Cc.)			
ST6TN1-9	75	158	0.5	0.06	0.01	0.01	0.00	0.08	0.02	0.48	570.5	443.9	65.1	6.4	82.2	16.1	64.0	271.4	64.0	3.1	64.0	7.7	64.0	3.1	0.0	(Cc.)			
ST6TN1-10	187	249	0.8	0.06	0.01	0.01	0.00	0.08	0.01	0.55	680.7	350.7	57.3	5.3	76.4	12.3	56.2	224.6	56.2	2.5	56.2	5.7	56.2	2.5	0.0	(Cc.)			
ST6TN1-11	318	587	0.5	0.05	0.01	0.01	0.00	0.08	0.01	0.69	382.5	242.5	64.3	5.2	74.9	8.6	63.7	121.1	63.7	2.6	63.7	4.0	63.7	2.6	0.0	(Cc.)			
ST6TN1-12	149	236	0.6	0.07	0.01	0.01	0.00	0.07	0.01	0.51	776.0	395.7	45.7	4.4	64.0	11.7	44.6	273.9	44.6	2.1	44.6	5.4	44.6	2.1	0.0	(Cc.)			
ST6TN1-13	312	603	0.5	0.08	0.01	0.01	0.00	0.08	0.01	0.57	1304.4	330.7	40.6	4.0	73.6	12.1	38.6	307.9	38.6	1.8	38.6	5.2	38.6	1.8	0.0	(Cc.)			
OD3	547	508	1.1	0.05	0.01	0.00	0.00	0.03	0.01	0.43	192.3	543.6	31.7	3.1	34.5	7.9	31.5	275.8	31.5	1.6	31.5	3.9	31.5	1.6	0.0	(Cc.)			
GJ1	17	351	0.0	0.06	0.00	0.10	0.01	0.81	0.07	0.91	604.4	135.6	588.2	43.9	600.4	38.9	587.0	39.8	587.0	21.9	587.0	19.2	587.0	21.9	0.0	(Cc.)			
NIST	27	73	0.4	0.07	0.01	0.17	0.01	1.79	0.17	0.86	1062.3	150.1	1011.3	77.5	1040.4	62.5	1007.3	51.8	1007.3	38.4	1007.3	31.0	1007.3	51.8	0.0	(Cc.)			
NIST	26	76	0.3	0.08	0.01	0.18	0.01	1.90	0.18	0.87	1096.3	147.3	1053.8	80.5	1080.9	63.4	1050.1	49.8	1050.1	40.0	1050.1	31.5	1050.1	49.8	0.0	(Cc.)			
NIST	27	77	0.4	0.07	0.01	0.18	0.01	1.83	0.18	0.86	1009.6	151.5	1059.9	81.0	1056.6	63.2	1060.4	49.1	1060.4	40.5	1060.4	31.6	1060.4	49.1	0.0	(Cc.)			
91500	24	70	0.3	0.07	0.01	0.18	0.01	1.82	0.18	0.85	1029.1	156.2	1043.5	80.5	1051.8	64.4	1042.4	52.9	1042.4	40.2	1042.4	32.1	1042.4	52.9	0.0	(Cc.)			
91500	23	68	0.3	0.07	0.01	0.19	0.02	1.97	0.19	0.87	1042.4	148.9	1114.5	84.9	1103.6	64.4	1116.1	46.9	1116.1	42.6	1116.1	32.3	1116.1	46.9	0.0	(Cc.)			
91500	24	67	0.4	0.07	0.01	0.19	0.02	1.91	0.19	0.85	1022.0	155.6	1094.7	84.3	1083.8	65.4	1096.3	50.5	1096.3	42.3	1096.3	32.8	1096.3	50.5	0.0	(Cc.)			
ST6TN1-15	35	65	0.5	0.12	0.01	0.32	0.02	5.10	0.36	1.05	1900.9	103.7	1777.6	114.7	1835.9	59.6													

ST6TN1-16	49	183	0.3	0.09	0.01	0.02	0.00	0.24	0.03	0.70	1419.2	224.7	125.1	10.0	220.5	23.0	119.0	181.0	118.6	4.5	118.6	9.6	118.6	4.5	0.0	(Cc.)
ST6TN1-17	207	321	0.6	0.06	0.01	0.01	0.00	0.06	0.01	0.51	547.7	377.0	48.6	4.2	60.3	9.8	47.9	214.8	47.9	2.0	47.9	4.7	47.9	2.0	0.0	(Cc.)
ST6TN1-18	132	217	0.6	0.10	0.02	0.01	0.00	0.10	0.02	0.61	1637.9	300.3	48.1	4.5	100.6	14.7	44.8	313.2	44.8	1.9	44.8	6.1	44.8	1.9	0.0	(Cc.)
ST6TN1-19	57	163	0.4	0.12	0.02	0.01	0.00	0.20	0.03	0.62	1925.8	295.7	80.0	7.7	187.9	26.7	72.9	359.9	72.9	3.2	72.9	11.1	72.9	3.2	0.0	(Cc.)
ST6TN1-20	173	362	0.5	0.06	0.01	0.01	0.00	0.08	0.01	0.56	479.6	328.3	65.5	5.3	78.0	11.0	64.7	173.5	64.7	2.6	64.7	5.2	64.7	2.6	0.0	(Cc.)
ST6TN1-21	188	244	0.8	0.08	0.01	0.01	0.00	0.10	0.02	0.59	1127.4	301.2	62.3	5.3	100.0	13.9	59.9	230.7	60.0	2.5	60.0	6.1	60.0	2.5	0.0	(Cc.)
ST6TN1-22	232	490	0.5	0.07	0.01	0.01	0.00	0.06	0.01	0.54	840.4	336.9	41.0	3.5	58.3	8.9	40.0	227.3	40.0	1.7	40.0	4.1	40.0	1.7	0.0	(Cc.)
ST6TN1-23	302	568	0.5	0.06	0.01	0.01	0.00	0.07	0.01	0.65	572.4	253.2	57.7	4.3	72.0	8.1	56.9	132.8	56.9	2.1	56.9	3.7	56.9	2.1	0.0	(Cc.)
ST6TN1-24	115	170	0.7	0.09	0.02	0.01	0.00	0.11	0.02	0.54	1345.5	360.3	57.8	5.5	103.5	17.6	54.9	329.4	54.9	2.5	54.9	7.8	54.9	2.5	0.0	(Cc.)
ST6TN1-25	358	652	0.5	0.05	0.01	0.01	0.00	0.05	0.01	0.59	389.3	298.3	40.3	3.1	46.8	6.0	40.0	148.0	40.0	1.5	40.0	2.9	40.0	1.5	0.0	(Cc.)
ST6TN1-26	59	117	0.5	0.06	0.02	0.01	0.00	0.07	0.02	0.39	592.0	625.4	54.2	5.8	68.3	18.4	53.3	389.8	53.3	2.8	53.3	8.9	53.3	2.8	0.0	(Cc.)
OD3	324	346	0.9	0.08	0.02	0.01	0.00	0.06	0.01	0.50	1288.7	404.3	34.7	3.4	61.4	11.8	33.0	369.6	33.0	1.6	33.0	5.2	33.0	1.6	0.0	(Cc.)
GJ1	18	348	0.1	0.06	0.00	0.09	0.01	0.77	0.05	0.98	576.7	136.7	577.0	38.3	577.4	31.3	577.0	16.8	577.0	19.1	577.0	15.6	577.0	19.1	0.0	(Cc.)
NIST	25	72	0.3	0.07	0.01	0.18	0.01	1.80	0.15	0.88	1046.4	156.4	1042.3	72.7	1044.3	56.0	1042.0	41.2	1042.0	36.3	1042.0	28.0	1042.0	41.2	0.0	(Cc.)
NIST	24	70	0.3	0.07	0.01	0.19	0.01	1.94	0.16	0.90	1059.7	149.1	1113.1	76.5	1095.9	55.6	1115.8	34.5	1115.8	38.5	1115.8	28.0	1115.8	34.5	0.0	(Cc.)
NIST	25	69	0.4	0.07	0.01	0.18	0.01	1.89	0.16	0.88	1039.3	155.9	1093.3	76.2	1076.1	56.9	1095.9	39.1	1095.9	38.3	1095.9	28.6	1095.9	39.1	0.0	(Cc.)
91500	25	71	0.4	0.08	0.01	0.18	0.01	1.89	0.16	0.90	1119.3	150.0	1054.4	73.2	1076.4	55.6	1051.3	38.3	1051.3	36.4	1051.3	27.5	1051.3	38.3	0.0	(Cc.)
91500	24	71	0.3	0.08	0.01	0.17	0.01	1.86	0.16	0.89	1133.0	153.2	1035.3	72.3	1067.9	56.3	1030.8	41.9	1030.8	35.9	1030.8	27.8	1030.8	41.9	0.0	(Cc.)
91500	25	73	0.3	0.08	0.01	0.17	0.01	1.83	0.16	0.89	1091.7	152.9	1039.4	72.3	1057.1	55.6	1037.0	40.2	1037.0	36.0	1037.0	27.6	1037.0	40.2	0.0	(Cc.)
ST6TN1-27	155	302	0.5	0.08	0.02	0.01	0.00	0.11	0.02	0.44	1212.2	374.7	63.0	5.1	104.3	18.2	60.4	332.0	60.4	2.4	60.4	8.5	60.4	2.4	0.0	(Cc.)
ST6TN1-28	5081	4466	1.1	0.05	0.00	0.01	0.00	0.04	0.00	0.65	314.5	142.2	39.6	1.9	44.0	3.1	39.3	73.5	39.3	0.9	39.3	1.5	39.3	0.9	0.0	(Cc.)
ST6TN1-29	56	163	0.3	0.07	0.01	0.01	0.00	0.10	0.02	0.44	980.6	381.4	66.9	5.3	99.0	17.1	64.9	291.5	64.9	2.5	64.9	8.1	64.9	2.5	0.0	(Cc.)
ST6TN1-30	269	579	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.45	196.1	298.7	58.0	3.4	60.9	7.7	57.8	145.6	57.8	1.7	57.8	3.8	57.8	1.7	0.0	(Cc.)
ST6TN1-31	409	840	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.51	350.5	225.6	62.0	3.3	69.3	7.0	61.5	119.1	61.5	1.6	61.5	3.4	61.5	1.6	0.0	(Cc.)
ST6TN1-33	316	656	0.5	0.05	0.01	0.01	0.00	0.04	0.01	0.44	359.0	310.9	38.3	2.3	43.5	5.9	38.0	167.9	38.0	1.2	38.0	2.9	38.0	1.2	0.0	(Cc.)
ST6TN1-34	436	678	0.6	0.06	0.01	0.01	0.00	0.05	0.01	0.45	430.5	307.5	38.8	2.4	45.5	6.1	38.4	173.0	38.4	1.2	38.4	3.0	38.4	1.2	0.0	(Cc.)
ST6TN1-35	108	297	0.4	0.06	0.01	0.01	0.00	0.08	0.01	0.43	412.2	354.7	64.3	4.3	73.8	11.2	63.7	195.0	63.7	2.1	63.7	5.5	63.7	2.1	0.0	(Cc.)
ST6TN1-36	126	275	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.40	396.0	380.8	64.2	4.3	73.2	11.9	63.7	209.1	63.7	2.1	63.7	5.8	63.7	2.1	0.0	(Cc.)
ST6TN1-37	50	120	0.4	0.23	0.03	0.01	0.00	0.39	0.05	0.71	3050.0	207.5	79.3	6.7	333.3	33.7	61.3	477.4	61.3	2.0	61.3	12.1	61.3	2.0	0.0	(Cc.)
ST6TN1-38	19	43	0.4	0.15	0.06	0.01	0.00	0.14	0.05	0.50	2367.4	657.7	42.8	7.4	131.5	43.5	37.2	1179.3	37.2	2.8	37.2	18.2	37.2	2.8	0.0	(Cc.)
ST6TN1-39	166	246	0.7	0.07	0.01	0.01	0.00	0.06	0.01	0.40	785.1	430.2	45.8	3.6	62.7	12.1	44.8	301.3	44.8	1.7	44.8	5.8	44.8	1.7	0.0	(Cc.)

OD3	440	370	1.2	0.08	0.02	0.01	0.00	0.05	0.01	0.40	1070.7	445.2	33.6	2.8	53.0	11.1	32.4	375.7	32.4	1.3	32.4	5.2	32.4	1.3	0.0	(Cc.)
GJ1	18	360	0.1	0.06	0.00	0.10	0.00	0.79	0.06	0.65	608.1	143.0	589.7	28.2	589.6	34.2	589.7	62.7	589.7	14.1	589.7	17.1	589.7	14.1	0.0	(Cc.)
NIST	25	70	0.4	0.08	0.01	0.18	0.01	1.94	0.17	0.67	1122.3	149.4	1089.8	57.2	1094.9	57.4	1089.1	64.6	1089.1	28.6	1089.1	28.8	1089.1	64.6	0.0	(Cc.)
NIST	24	71	0.3	0.08	0.01	0.18	0.01	1.91	0.17	0.66	1135.9	152.5	1070.1	56.8	1086.2	58.2	1067.8	67.5	1067.8	28.3	1067.8	29.2	1067.8	67.5	0.0	(Cc.)
NIST	24	73	0.3	0.08	0.01	0.18	0.01	1.88	0.16	0.66	1094.7	152.2	1074.3	56.6	1075.3	57.5	1074.2	65.5	1074.2	28.3	1074.2	28.7	1074.2	65.5	0.0	(Cc.)
91500	25	75	0.3	0.07	0.01	0.18	0.01	1.82	0.16	0.66	1058.3	155.3	1058.7	56.1	1052.8	57.4	1059.5	65.9	1059.5	28.1	1059.5	28.7	1059.5	65.9	0.0	(Cc.)
91500	26	74	0.3	0.07	0.01	0.18	0.01	1.81	0.16	0.65	1041.4	158.3	1060.7	56.5	1048.7	58.1	1062.4	66.5	1062.4	28.4	1062.4	28.9	1062.4	66.5	0.0	(Cc.)
91500	25	73	0.3	0.08	0.01	0.17	0.01	1.84	0.16	0.66	1150.3	155.1	1024.5	55.1	1059.7	58.1	1019.7	71.3	1019.7	27.3	1019.7	29.3	1019.7	71.3	0.0	(Cc.)
ST6TN1-40	3228	1637	2.0	0.05	0.00	0.01	0.00	0.05	0.00	0.57	317.5	200.9	42.2	1.9	47.7	3.8	41.9	89.7	41.9	1.0	41.9	1.8	41.9	1.0	0.0	(Cc.)
ST6TN1-41	221	422	0.5	0.05	0.01	0.01	0.00	0.05	0.01	0.38	225.7	399.1	45.0	2.8	48.9	7.8	44.8	196.7	44.8	1.4	44.8	3.9	44.8	1.4	0.0	(Cc.)
ST6TN1-43	173	239	0.7	0.06	0.01	0.01	0.00	0.07	0.01	0.39	585.0	405.7	56.7	3.9	71.6	12.2	55.8	246.2	55.8	1.9	55.8	5.9	55.8	1.9	0.0	(Cc.)
ST6TN1-44	111	210	0.5	0.07	0.01	0.01	0.00	0.08	0.01	0.44	923.5	373.7	55.9	4.1	82.4	13.4	54.3	272.5	54.3	1.9	54.3	6.3	54.3	1.9	0.0	(Cc.)
ST6TN1-45	93	157	0.6	0.05	0.01	0.01	0.00	0.07	0.02	0.33	199.7	566.3	64.5	5.0	68.7	15.5	64.3	280.3	64.3	2.5	64.3	7.7	64.3	2.5	0.0	(Cc.)
ST6TN1-46	147	180	0.8	0.06	0.01	0.01	0.00	0.07	0.02	0.35	413.1	523.9	57.4	4.5	67.1	14.5	56.8	293.6	56.8	2.2	56.8	7.1	56.8	2.2	0.0	(Cc.)
ST6TN1-47	250	253	1.0	0.21	0.02	0.01	0.00	0.27	0.02	0.77	2881.8	167.2	60.1	3.9	242.3	18.5	47.9	293.2	47.9	1.3	47.9	5.9	47.9	1.3	0.0	(Cc.)
ST6TN1-48	122	174	0.7	0.05	0.01	0.01	0.00	0.06	0.02	0.31	146.0	601.3	57.3	4.4	59.9	14.4	57.1	292.5	57.1	2.2	57.1	7.2	57.1	2.2	0.0	(Cc.)
ST6TN1-50	106	166	0.6	0.07	0.01	0.01	0.00	0.08	0.02	0.41	815.5	436.9	53.6	4.3	75.2	14.2	52.3	303.5	52.3	2.0	52.3	6.8	52.3	2.0	0.0	(Cc.)
ST6TN1-51	129	344	0.4	0.07	0.01	0.01	0.00	0.10	0.01	0.48	785.0	273.4	69.0	4.0	94.6	10.9	67.4	174.8	67.4	1.9	67.4	5.1	67.4	1.9	0.0	(Cc.)
OD3	524	488	1.1	0.07	0.01	0.01	0.00	0.06	0.01	0.48	1040.8	289.5	40.5	2.6	63.7	8.2	39.0	221.2	39.0	1.2	39.0	3.7	39.0	1.2	0.0	(Cc.)
GJ1	18	342	0.1	0.06	0.00	0.10	0.00	0.86	0.05	0.81	695.5	129.9	610.4	25.4	632.5	25.3	608.3	35.9	608.3	12.6	608.3	12.5	608.3	12.6	0.0	(Cc.)
NIST	25	76	0.3	0.07	0.01	0.18	0.01	1.85	0.13	0.73	1050.5	153.4	1062.9	51.6	1064.0	47.6	1062.8	49.9	1062.8	25.8	1062.8	23.8	1062.8	49.9	0.0	(Cc.)
NIST	26	74	0.3	0.07	0.01	0.18	0.01	1.84	0.14	0.72	1033.6	156.5	1064.9	52.0	1059.8	48.5	1065.7	51.0	1065.7	26.0	1065.7	24.2	1065.7	51.0	0.0	(Cc.)
NIST	25	74	0.3	0.08	0.01	0.17	0.01	1.87	0.14	0.73	1142.7	153.3	1028.6	50.7	1070.9	48.4	1022.8	54.2	1022.8	25.1	1022.8	24.3	1022.8	54.2	0.0	(Cc.)
91500	26	75	0.3	0.08	0.01	0.18	0.01	1.89	0.13	0.74	1095.4	147.7	1063.3	50.7	1079.0	46.3	1061.2	48.2	1061.2	25.2	1061.2	23.2	1061.2	48.2	0.0	(Cc.)
91500	25	73	0.3	0.07	0.01	0.18	0.01	1.90	0.13	0.74	1061.8	148.5	1084.4	51.7	1082.1	46.4	1084.7	46.7	1084.7	25.9	1084.7	23.2	1084.7	46.7	0.0	(Cc.)
91500	26	76	0.4	0.07	0.01	0.18	0.01	1.85	0.13	0.74	1023.8	150.6	1073.8	51.3	1062.5	46.4	1075.5	47.0	1075.5	25.7	1075.5	23.2	1075.5	47.0	0.0	(Cc.)
ST6TN1-53	242	196	1.2	0.07	0.02	0.01	0.00	0.07	0.02	0.33	832.1	472.6	50.8	3.7	71.1	15.2	49.5	353.0	49.5	1.8	49.5	7.4	49.5	1.8	0.0	(Cc.)
ST6TN1-54	108	177	0.6	0.07	0.01	0.01	0.00	0.08	0.02	0.35	775.4	441.0	59.3	4.2	80.6	15.9	58.0	314.4	58.0	2.0	58.0	7.7	58.0	2.0	0.0	(Cc.)
ST6TN1-55	339	585	0.6	0.05	0.01	0.01	0.00	0.05	0.01	0.33	400.0	318.3	39.8	1.9	46.2	6.5	39.4	188.1	39.4	0.9	39.4	3.2	39.4	0.9	0.0	(Cc.)
ST6TN1-56	187	313	0.6	0.09	0.01	0.01	0.00	0.08	0.01	0.42	1375.9	302.6	40.1	2.5	73.6	10.9	38.1	311.3	38.1	1.2	38.1	5.0	38.1	1.2	0.0	(Cc.)
ST6TN1-57	239	389	0.6	0.06	0.01	0.01	0.00	0.05	0.01	0.33	465.6	379.8	41.1	2.3	49.0	8.1	40.6	230.2	40.6	1.1	40.6	4.0	40.6	1.1	0.0	(Cc.)

ST6TN1-58	525	819	0.6	0.05	0.01	0.01	0.00	0.04	0.01	0.32	98.7	287.3	41.5	1.7	42.3	5.2	41.4	144.3	41.4	0.8	41.4	2.6	41.4	0.8	0.0	(Cc.)
ST6TN1-59	188	437	0.4	0.07	0.01	0.01	0.00	0.11	0.01	0.38	1050.8	225.6	66.1	2.9	101.5	11.1	63.8	197.8	63.8	1.4	63.8	5.3	63.8	1.4	0.0	(Cc.)
ST6TN1-60	69	184	0.4	0.06	0.01	0.01	0.00	0.09	0.02	0.34	610.7	411.4	69.2	4.4	86.7	15.6	68.1	265.7	68.1	2.1	68.1	7.6	68.1	2.1	0.0	(Cc.)
ST6TN1-61	124	126	1.0	0.10	0.02	0.01	0.00	0.09	0.02	0.41	1555.1	432.7	45.1	4.0	90.2	19.0	42.3	491.3	42.3	1.8	42.3	8.7	42.3	1.8	0.0	(Cc.)
ST6TN1-63	5	16	0.3	0.15	0.04	0.03	0.00	0.55	0.15	0.51	2334.4	491.2	169.8	22.9	442.3	96.2	149.0	818.0	148.8	8.8	148.8	49.0	148.8	8.8	0.0	(Cc.)
ST6TN1-64	61	171	0.4	0.05	0.01	0.01	0.00	0.06	0.02	0.28	-17.2	584.5	65.2	4.4	62.8	14.5	65.2	261.8	65.2	2.2	65.2	7.3	65.2	2.2	0.0	(Cc.)
OD3	61	116	0.5	0.20	0.05	0.01	0.00	0.16	0.04	0.56	2829.9	403.7	38.3	4.8	154.1	31.8	30.9	942.6	30.9	1.6	30.9	12.1	30.9	1.6	0.0	(Cc.)
GJ1	18	352	0.1	0.06	0.00	0.10	0.00	0.79	0.06	0.40	561.4	131.5	599.9	17.0	590.0	33.5	600.9	72.7	600.9	8.6	600.9	16.7	600.9	8.6	0.0	(Cc.)
NIST	26	74	0.4	0.08	0.01	0.18	0.01	1.87	0.16	0.48	1111.4	138.1	1054.5	38.7	1070.4	55.3	1052.3	75.9	1052.3	19.3	1052.3	27.9	1052.3	75.9	0.0	(Cc.)
NIST	25	72	0.3	0.08	0.01	0.18	0.01	1.88	0.16	0.48	1077.8	138.8	1075.4	39.5	1073.4	55.4	1075.6	73.6	1075.6	19.8	1075.6	27.7	1075.6	73.6	0.0	(Cc.)
NIST	26	75	0.4	0.07	0.01	0.18	0.01	1.82	0.15	0.47	1039.9	140.9	1064.9	39.2	1053.9	55.2	1066.4	73.2	1066.4	19.6	1066.4	27.4	1066.4	73.2	0.0	(Cc.)
91500	27	78	0.3	0.07	0.01	0.18	0.01	1.80	0.15	0.47	1026.3	145.0	1056.8	39.5	1044.1	55.9	1058.6	74.5	1058.6	19.8	1058.6	27.8	1058.6	74.5	0.0	(Cc.)
91500	26	75	0.4	0.08	0.01	0.18	0.01	1.91	0.16	0.48	1119.6	142.5	1072.7	40.7	1085.5	57.1	1070.9	77.0	1070.9	20.3	1070.9	28.8	1070.9	77.0	0.0	(Cc.)
91500	25	75	0.3	0.08	0.01	0.18	0.01	1.93	0.16	0.48	1172.3	139.5	1054.0	39.9	1090.4	56.6	1048.9	79.1	1048.9	19.8	1048.9	28.9	1048.9	79.1	0.0	(Cc.)
ST6TN1-66	195	350	0.6	0.06	0.01	0.01	0.00	0.06	0.01	0.38	734.9	346.4	40.5	2.5	55.0	8.7	39.6	246.3	39.6	1.2	39.6	4.2	39.6	1.2	0.0	(Cc.)
ST6TN1-67	407	786	0.5	0.06	0.01	0.01	0.00	0.06	0.01	0.42	629.5	228.3	42.6	2.0	55.1	6.0	41.9	157.4	41.9	1.0	41.9	2.9	41.9	1.0	0.0	(Cc.)
ST6TN1-68	1185	1339	0.9	0.05	0.00	0.01	0.00	0.04	0.00	0.42	150.7	211.5	41.2	1.7	43.3	4.2	41.1	113.4	41.1	0.9	41.1	2.1	41.1	0.9	0.0	(Cc.)
ST6TN1-70	278	581	0.5	0.05	0.01	0.01	0.00	0.05	0.01	0.38	365.7	311.1	39.5	2.1	45.4	6.3	39.1	180.2	39.1	1.0	39.1	3.1	39.1	1.0	0.0	(Cc.)
ST6TN1-72	218	317	0.7	0.06	0.01	0.01	0.00	0.07	0.01	0.37	497.9	351.1	55.8	3.3	67.5	10.4	55.1	215.7	55.1	1.6	55.1	5.1	55.1	1.6	0.0	(Cc.)
ST6TN1-74	212	788	0.3	0.05	0.00	0.01	0.00	0.07	0.01	0.42	181.8	220.9	67.7	2.9	71.2	7.1	67.5	117.5	67.5	1.4	67.5	3.5	67.5	1.4	0.0	(Cc.)
ST6TN1-75	265	567	0.5	0.05	0.01	0.01	0.00	0.05	0.01	0.37	381.3	312.4	41.1	2.2	47.6	6.6	40.7	183.1	40.7	1.1	40.7	3.2	40.7	1.1	0.0	(Cc.)
ST6TN1-77	261	349	0.7	0.05	0.01	0.01	0.00	0.06	0.01	0.35	208.1	392.2	51.0	3.0	54.6	9.0	50.8	203.9	50.8	1.5	50.8	4.5	50.8	1.5	0.0	(Cc.)
ST6TN1-78	39	84	0.5	0.08	0.02	0.01	0.00	0.11	0.03	0.38	1196.8	539.1	62.2	6.1	103.5	25.9	59.6	494.8	59.6	2.8	59.6	12.3	59.6	2.8	0.1	(Cc.)
OD3	54	107	0.5	0.31	0.06	0.01	0.00	0.29	0.05	0.76	3514.9	289.4	43.6	5.3	258.5	36.2	29.1	816.5	29.1	1.2	29.1	9.8	29.1	1.2	0.0	(Cc.)
GJ1	18	347	0.1	0.06	0.00	0.10	0.00	0.82	0.06	0.54	640.6	114.5	594.1	21.8	605.5	32.7	593.0	67.3	593.0	10.8	593.0	16.4	593.0	10.8	0.0	(Cc.)
NIST	27	77	0.3	0.07	0.01	0.18	0.01	1.80	0.15	0.56	1028.9	137.8	1050.2	46.2	1045.8	55.3	1050.8	70.1	1050.8	23.1	1050.8	27.6	1050.8	70.1	0.0	(Cc.)
NIST	26	74	0.4	0.08	0.01	0.18	0.01	1.92	0.16	0.57	1122.2	135.4	1066.1	47.4	1087.2	56.5	1063.1	72.3	1063.1	23.6	1063.1	28.5	1063.1	72.3	0.0	(Cc.)
NIST	25	75	0.3	0.08	0.01	0.18	0.01	1.93	0.16	0.57	1174.8	132.3	1047.5	46.5	1092.1	56.0	1041.2	74.2	1041.2	23.0	1041.2	28.6	1041.2	74.2	0.0	(Cc.)
91500	25	74	0.3	0.08	0.01	0.18	0.01	1.84	0.15	0.57	1070.0	135.4	1052.3	46.3	1060.5	55.4	1051.1	70.8	1051.1	23.1	1051.1	27.8	1051.1	70.8	0.0	(Cc.)
91500	25	72	0.3	0.07	0.00	0.18	0.01	1.86	0.16	0.57	1025.9	134.1	1084.2	47.1	1067.5	55.1	1086.7	67.1	1086.7	23.6	1086.7	27.3	1086.7	67.1	0.0	(Cc.)
91500	27	73	0.4	0.07	0.00	0.18	0.01	1.85	0.16	0.56	1030.2	136.9	1077.9	47.4	1064.7	55.8	1079.8	68.5	1079.8	23.8	1079.8	27.7	1079.8	68.5	0.0	(Cc.)

ST6TN1-80	76	192	0.4	0.07	0.01	0.01	0.00	0.09	0.02	0.41	833.7	382.3	60.9	4.6	86.7	15.3	59.3	289.1	59.3	2.2	59.3	7.3	59.3	2.2	0.0	(Cc.)
ST6TN1-82	61	131	0.5	0.10	0.02	0.01	0.00	0.17	0.03	0.49	1536.8	302.0	83.0	6.5	162.4	24.1	77.8	339.3	77.8	2.9	77.8	11.1	77.8	2.9	0.0	(Cc.)
ST6TN1-83	86	216	0.4	0.07	0.01	0.01	0.00	0.11	0.02	0.48	1062.9	290.3	68.5	4.8	107.9	15.1	66.0	249.1	66.1	2.2	66.1	7.0	66.1	2.2	0.0	(Cc.)
ST6TN1-84	222	355	0.6	0.05	0.01	0.01	0.00	0.07	0.01	0.42	198.8	331.1	67.3	4.2	72.2	10.4	67.0	172.9	67.0	2.1	67.0	5.1	67.0	2.1	0.0	(Cc.)
ST6TN1-85	114	163	0.7	0.05	0.01	0.01	0.00	0.06	0.02	0.32	188.5	595.1	57.3	4.7	61.5	15.2	57.1	308.8	57.1	2.3	57.1	7.5	57.1	2.3	0.0	(Cc.)
ST6TN1-86	78	302	0.3	0.05	0.00	0.04	0.00	0.32	0.03	0.56	394.8	176.8	260.3	13.7	278.4	23.4	259.0	99.3	259.0	6.8	259.0	11.6	259.0	6.8	0.0	(Cc.)
ST6TN1-87	539	788	0.7	0.05	0.01	0.01	0.00	0.07	0.01	0.49	231.4	229.6	59.5	3.3	64.9	7.0	59.1	127.1	59.1	1.6	59.1	3.5	59.1	1.6	0.0	(Cc.)
ST6TN1-88	176	412	0.4	0.05	0.01	0.01	0.00	0.04	0.01	0.37	41.6	440.1	43.2	3.0	43.9	8.0	43.2	210.8	43.2	1.5	43.2	4.0	43.2	1.5	0.0	(Cc.)
ST6TN1-89	381	591	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.44	46.3	302.9	56.8	3.4	57.5	7.6	56.7	146.5	56.7	1.7	56.7	3.8	56.7	1.7	0.0	(Cc.)
OD3	402	377	1.1	0.08	0.02	0.01	0.00	0.05	0.01	0.41	1077.7	425.5	33.0	2.8	53.7	10.9	31.8	373.6	31.8	1.3	31.8	5.1	31.8	1.3	0.0	(Cc.)
GJ1	17	337	0.1	0.06	0.00	0.09	0.00	0.80	0.07	0.62	615.0	130.6	584.4	28.9	598.4	37.8	583.0	73.5	583.0	14.4	583.0	18.9	583.0	14.4	0.0	(Cc.)
NIST	25	72	0.3	0.07	0.01	0.17	0.01	1.82	0.17	0.62	1057.3	147.0	1036.5	56.4	1054.4	61.9	1034.0	76.6	1034.0	28.1	1034.0	31.1	1034.0	76.6	0.0	(Cc.)
NIST	24	70	0.3	0.07	0.01	0.18	0.01	1.84	0.17	0.63	1013.1	146.0	1068.0	57.6	1061.4	61.6	1068.9	72.6	1068.9	28.9	1068.9	30.8	1068.9	72.6	0.0	(Cc.)
NIST	26	71	0.4	0.07	0.01	0.18	0.01	1.84	0.17	0.62	1017.4	148.6	1061.7	57.8	1058.6	62.2	1062.2	74.1	1062.2	28.9	1062.2	31.1	1062.2	74.1	0.0	(Cc.)
91500	27	76	0.4	0.07	0.01	0.18	0.01	1.90	0.18	0.63	1024.1	144.2	1093.2	58.7	1081.8	62.0	1094.9	71.3	1094.9	29.4	1094.9	30.9	1094.9	71.3	0.0	(Cc.)
91500	26	76	0.3	0.07	0.01	0.17	0.01	1.82	0.17	0.63	1047.9	144.4	1037.2	56.0	1051.9	61.0	1035.2	75.0	1035.2	27.9	1035.2	30.7	1035.2	75.0	0.0	(Cc.)
91500	26	72	0.4	0.08	0.01	0.18	0.01	1.98	0.18	0.63	1129.5	140.7	1081.4	58.4	1109.1	62.5	1077.5	75.1	1077.5	29.0	1077.5	31.5	1077.5	75.1	0.0	(Cc.)
ST6TN1-92	335	401	0.8	0.06	0.01	0.01	0.00	0.06	0.01	0.44	492.0	318.2	49.2	3.1	59.5	8.4	48.5	189.2	48.5	1.5	48.5	4.0	48.5	1.5	0.0	(Cc.)
ST6TN1-93	373	708	0.5	0.05	0.01	0.01	0.00	0.04	0.01	0.45	265.1	292.8	39.0	2.3	43.0	5.5	38.8	154.5	38.8	1.1	38.8	2.7	38.8	1.1	0.0	(Cc.)
ST6TN1-94	376	639	0.6	0.06	0.01	0.01	0.00	0.05	0.01	0.48	700.6	254.2	38.1	2.2	50.9	6.1	37.3	172.3	37.3	1.1	37.3	2.8	37.3	1.1	0.0	(Cc.)
ST6TN1-95	305	443	0.7	0.06	0.01	0.01	0.00	0.08	0.01	0.47	450.5	270.2	62.8	3.6	74.1	8.9	62.1	156.6	62.1	1.8	62.1	4.3	62.1	1.8	0.0	(Cc.)
ST6TN1-96	143	196	0.7	0.05	0.01	0.01	0.00	0.06	0.01	0.37	259.4	466.0	58.6	4.3	63.9	12.4	58.3	242.9	58.3	2.1	58.3	6.1	58.3	2.1	0.0	(Cc.)
ST6TN1-97	241	513	0.5	0.06	0.01	0.01	0.00	0.05	0.01	0.45	628.8	297.3	39.0	2.4	50.4	6.8	38.3	193.7	38.3	1.2	38.3	3.3	38.3	1.2	0.0	(Cc.)
ST6TN1-98	7891	1710	4.6	0.05	0.00	0.01	0.00	0.05	0.00	0.56	303.0	183.7	42.1	2.1	47.1	4.1	41.8	100.4	41.8	1.0	41.8	2.0	41.8	1.0	0.0	(Cc.)
ST6TN1-99	284	533	0.5	0.06	0.01	0.01	0.00	0.06	0.01	0.41	698.6	406.8	44.6	3.4	59.3	10.8	43.7	273.2	43.7	1.6	43.7	5.2	43.7	1.6	0.0	(Cc.)
ST6TN1-100	258	621	0.4	0.07	0.01	0.01	0.00	0.06	0.01	0.45	837.7	310.0	39.2	2.6	55.8	8.1	38.2	227.8	38.2	1.2	38.2	3.8	38.2	1.2	0.0	(Cc.)
ST6TN1-101	40	111	0.4	0.09	0.02	0.01	0.00	0.12	0.02	0.47	1458.0	382.0	62.3	5.6	117.7	21.4	58.8	394.5	58.8	2.5	58.8	9.8	58.8	2.5	0.0	(Cc.)
ST6TN1-102	451	738	0.6	0.05	0.01	0.01	0.00	0.04	0.01	0.44	160.7	301.3	37.3	2.2	39.3	5.1	37.2	149.8	37.2	1.1	37.2	2.5	<u>37.2*</u>	<u>1.1*</u>	0.0	(Cc.)
ST6TN1-103	305	343	0.9	0.05	0.01	0.01	0.00	0.05	0.01	0.40	315.0	378.4	47.7	3.2	53.5	8.7	47.3	204.4	47.3	1.6	47.3	4.2	47.3	1.6	0.0	(Cc.)
ST6TN1-104	126	245	0.5	0.06	0.01	0.01	0.00	0.10	0.01	0.44	618.5	324.5	75.6	5.0	95.4	13.7	74.4	205.5	74.4	2.4	74.4	6.6	74.4	2.4	0.0	(Cc.)
OD3	487	473	1.0	0.07	0.01	0.01	0.00	0.05	0.01	0.42	790.7	376.3	33.7	2.5	47.1	8.1	32.9	270.5	32.9	1.2	32.9	3.8	32.9	1.2	0.0	(Cc.)

GJ1	19	358	0.1	0.06	0.00	0.10	0.00	0.77	0.06	0.64	476.9	140.8	605.9	28.6	580.5	34.4	609.0	61.1	609.0	14.5	609.0	17.2	609.0	14.5	0.0	(Cc.)
NIST	26	74	0.4	0.07	0.01	0.18	0.01	1.87	0.17	0.64	1023.3	152.4	1090.9	57.1	1070.2	58.8	1094.0	66.3	1094.0	28.7	1094.0	29.3	1094.0	66.3	0.0	(Cc.)
NIST	26	74	0.3	0.07	0.01	0.17	0.01	1.79	0.16	0.64	1047.2	152.5	1035.0	54.5	1040.5	58.0	1034.3	69.7	1034.3	27.2	1034.3	29.0	1034.3	69.7	0.0	(Cc.)
NIST	26	71	0.4	0.08	0.01	0.18	0.01	1.95	0.17	0.65	1128.8	148.9	1079.1	56.8	1097.4	59.3	1076.5	69.7	1076.5	28.3	1076.5	29.8	1076.5	69.7	0.0	(Cc.)
91500	23	68	0.3	0.08	0.01	0.18	0.01	1.91	0.17	0.65	1101.9	148.8	1074.4	56.3	1085.2	58.7	1072.9	68.7	1072.9	28.1	1072.9	29.5	1072.9	68.7	0.0	(Cc.)
91500	26	73	0.4	0.08	0.01	0.18	0.01	1.87	0.16	0.65	1090.3	146.8	1056.8	54.7	1069.4	57.5	1055.0	68.3	1055.0	27.3	1055.0	28.9	1055.0	68.3	0.0	(Cc.)
91500	26	73	0.4	0.08	0.01	0.18	0.01	1.83	0.16	0.64	1076.6	149.7	1041.8	54.6	1054.7	57.8	1040.1	69.5	1040.1	27.2	1040.1	29.0	1040.1	69.5	0.0	(Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 86
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age}) / (^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

B.5 Harutori Formation (ST5HR1)

U-Pb LA-ICP-MS Detrital Zircon Data of Harutori Formation																														
Sample Location: Station-5, Akkeshi Bay Area, Eastern Hokkaido, Japan																														
Formation / Group: Harutori Formation / Urahoro Group																														
Belt: Nemuro Belt																														
Sample Type: Sandstone (medium - coarse sandstone)																														
Grain Number	Th (PPM)	U (PPM)	Th/U	Isotopic Ratios							U-Pb Age (Ma)								U-Pb Age (Ma)								Preferred Age	± 2σ	Disc. (%)	
											before Stacey-Kramers Correction								after Stacey-Kramers Correction											
				207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ	Error Corr.	207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ	207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ								
ST5HR1-2	99	176	0.6	0.06	0.01	0.01	0.00	0.08	0.02	0.39	593.0	442.7	63.9	4.9	81.3	15.2	62.8	272.6	62.8	2.4	62.8	7.3	62.8	2.4	0.0	(Cc.)				
ST5HR1-3	70	222	0.3	0.06	0.01	0.01	0.00	0.09	0.01	0.43	653.8	389.2	64.3	4.7	84.0	13.8	63.1	242.8	63.1	2.3	63.1	6.6	63.1	2.3	0.0	(Cc.)				
ST5HR1-6	44	121	0.4	0.04	0.02	0.01	0.00	0.05	0.02	0.23	-336.2	1066.9	59.3	5.6	51.5	20.4	59.3	407.4	59.3	2.8	59.3	10.2	59.3	2.8	0.0	(Cc.)				
ST5HR1-7	74	132	0.6	0.05	0.02	0.01	0.00	0.05	0.02	0.23	24.5	1004.7	49.8	4.8	50.0	20.0	49.7	478.6	49.7	2.4	49.7	10.0	49.7	2.4	-0.1	(Cc.)				
ST5HR1-8	798	895	0.9	0.05	0.01	0.01	0.00	0.06	0.01	0.52	210.5	245.3	55.3	2.8	59.9	5.8	55.0	109.7	55.0	1.4	55.0	2.8	55.0	1.4	0.0	(Cc.)				
ST5HR1-10	83	197	0.4	0.05	0.01	0.01	0.00	0.06	0.02	0.31	364.7	603.0	52.8	4.3	61.2	15.3	52.3	340.3	52.3	2.1	52.3	7.6	52.3	2.1	0.0	(Cc.)				
ST5HR1-11	32	80	0.4	0.05	0.03	0.01	0.00	0.06	0.03	0.24	367.6	1126.6	54.3	6.4	62.9	29.8	53.8	658.3	53.8	3.1	53.8	14.8	53.8	3.1	0.0	(Cc.)				
ST5HR1-12	6800	2974	2.3	0.05	0.00	0.01	0.00	0.07	0.00	0.79	393.2	143.6	56.0	2.5	65.5	3.6	55.4	49.6	55.4	1.2	55.4	1.7	55.4	1.2	0.0	(Cc.)				
OD3	556	431	1.3	0.07	0.01	0.01	0.00	0.05	0.01	0.38	884.0	428.5	34.5	2.6	50.9	9.8	33.5	324.9	33.5	1.2	33.5	4.6	33.5	1.2	0.0	(Cc.)				
GJ1	18	347	0.1	0.06	0.00	0.09	0.00	0.80	0.05	0.83	631.1	133.6	581.5	26.1	598.9	25.6	579.9	35.8	579.9	13.0	579.9	12.6	579.9	13.0	0.0	(Cc.)				
NIST	25	67	0.4	0.07	0.01	0.18	0.01	1.91	0.15	0.74	1066.7	158.9	1075.7	56.2	1083.3	51.1	1074.7	52.5	1074.7	28.0	1074.7	25.6	1074.7	52.5	0.0	(Cc.)				
NIST	24	68	0.3	0.07	0.01	0.18	0.01	1.89	0.14	0.75	1048.2	155.1	1076.0	55.3	1077.4	49.4	1075.8	49.5	1075.8	27.7	1075.8	24.7	1075.8	49.5	0.0	(Cc.)				
NIST	24	69	0.3	0.07	0.01	0.18	0.01	1.85	0.14	0.74	1000.6	158.2	1077.3	55.5	1062.7	49.7	1079.4	49.7	1079.4	27.8	1079.4	24.9	1079.4	49.7	0.0	(Cc.)				
91500	26	75	0.4	0.08	0.01	0.17	0.01	1.85	0.13	0.76	1110.7	151.6	1023.1	52.3	1061.9	48.2	1017.8	51.6	1017.8	25.9	1017.8	24.1	1017.8	51.6	0.0	(Cc.)				
91500	24	70	0.3	0.07	0.01	0.18	0.01	1.83	0.13	0.75	1015.2	154.9	1058.5	53.9	1054.9	48.4	1059.0	49.0	1059.0	27.0	1059.0	24.2	1059.0	49.0	0.0	(Cc.)				
91500	28	72	0.4	0.07	0.01	0.18	0.01	1.89	0.14	0.75	1067.7	152.8	1067.4	54.5	1078.0	48.8	1065.9	49.3	1065.9	27.2	1065.9	24.4	1065.9	49.3	0.0	(Cc.)				
ST5HR1-14	130	200	0.6	0.06	0.01	0.01	0.00	0.07	0.01	0.40	524.7	445.4	58.7	4.7	71.2	13.8	57.9	266.5	58.0	2.3	58.0	6.7	58.0	2.3	0.0	(Cc.)				
ST5HR1-15	296	389	0.8	0.04	0.01	0.01	0.00	0.05	0.01	0.38	-259.5	449.5	57.9	3.9	50.8	8.9	57.9	172.2	57.9	2.0	57.9	4.5	57.9	2.0	0.0	(Cc.)				
ST5HR1-16	85	243	0.3	0.06	0.01	0.01	0.00	0.09	0.01	0.45	460.2	341.3	78.1	5.5	91.2	13.5	77.3	192.6	77.3	2.7	77.3	6.6	77.3	2.7	0.0	(Cc.)				
ST5HR1-17	65	144	0.5	0.06	0.01	0.01	0.00	0.07	0.02	0.37	531.8	563.5	57.3	5.3	69.7	16.9	56.5	341.6	56.5	2.6	56.5	8.3	56.5	2.6	0.0	(Cc.)				

ST5HR1-19	170	288	0.6	0.06	0.01	0.01	0.00	0.07	0.01	0.43	494.3	376.3	56.9	4.1	68.1	11.2	56.2	221.4	56.2	2.0	56.2	5.4	56.2	2.0	0.0	(Cc.)
ST5HR1-23	125	374	0.3	0.05	0.01	0.01	0.00	0.06	0.01	0.44	226.0	354.1	59.7	4.1	63.7	9.5	59.5	176.5	59.5	2.0	59.5	4.7	59.5	2.0	0.0	(Cc.)
ST5HR1-24	132	355	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.45	199.5	358.6	57.1	3.9	60.3	9.1	57.0	175.4	57.0	2.0	57.0	4.5	57.0	2.0	0.0	(Cc.)
ST5HR1-25	83	311	0.3	0.05	0.01	0.01	0.00	0.06	0.01	0.42	177.3	401.8	56.7	4.1	59.3	9.9	56.6	195.7	56.6	2.0	56.6	4.9	56.6	2.0	0.0	(Cc.)
ST5HR1-26	43	119	0.4	0.05	0.01	0.02	0.00	0.18	0.03	0.45	326.6	361.2	155.8	11.1	166.0	24.6	155.0	180.0	155.1	5.5	155.1	12.2	155.1	5.5	0.0	(Cc.)
OD3	142	152	0.9	0.15	0.03	0.01	0.00	0.11	0.02	0.54	2300.2	400.2	35.9	4.2	107.6	22.0	31.4	678.0	31.4	1.6	31.4	8.9	31.4	1.6	0.0	(Cc.)
GJ1	17	321	0.1	0.06	0.00	0.10	0.01	0.84	0.06	0.74	640.4	124.0	615.8	32.3	618.8	34.2	615.6	53.6	615.6	16.1	615.6	17.1	615.6	16.1	0.0	(Cc.)
NIST	25	72	0.4	0.08	0.01	0.17	0.01	1.85	0.16	0.71	1127.0	147.1	1037.7	60.0	1063.5	58.3	1034.2	65.7	1034.2	29.8	1034.2	29.2	1034.2	65.7	0.0	(Cc.)
NIST	24	67	0.4	0.07	0.01	0.18	0.01	1.83	0.16	0.70	1031.7	150.3	1073.6	61.9	1056.5	58.4	1076.1	61.8	1076.1	31.1	1076.1	29.2	1076.1	61.8	0.0	(Cc.)
NIST	27	69	0.4	0.08	0.01	0.18	0.01	1.90	0.17	0.71	1084.1	148.3	1082.6	62.5	1079.7	58.9	1083.0	62.5	1083.0	31.3	1083.0	29.4	1083.0	62.5	0.0	(Cc.)
91500	26	71	0.4	0.07	0.01	0.19	0.01	1.86	0.16	0.71	1019.8	147.9	1094.8	62.7	1066.6	58.0	1099.2	59.3	1099.2	31.6	1099.2	28.9	1099.2	59.3	0.0	(Cc.)
91500	25	69	0.4	0.08	0.01	0.18	0.01	1.97	0.17	0.72	1204.0	142.3	1058.4	61.0	1103.6	58.6	1052.0	65.6	1052.0	30.1	1052.0	29.5	1052.0	65.6	0.0	(Cc.)
91500	26	72	0.4	0.08	0.01	0.17	0.01	1.81	0.16	0.70	1092.5	149.2	1030.9	59.7	1047.5	58.1	1028.6	65.5	1028.6	29.7	1028.6	29.1	1028.6	65.5	0.0	(Cc.)
ST5HR1-27	134	223	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.37	211.9	463.1	57.6	4.3	60.3	11.7	57.4	232.7	57.4	2.1	57.4	5.8	57.4	2.1	0.0	(Cc.)
ST5HR1-29	97	197	0.5	0.06	0.01	0.01	0.00	0.08	0.01	0.39	722.4	418.3	56.7	4.4	74.3	14.1	55.6	284.7	55.6	2.1	55.6	6.8	55.6	2.1	0.0	(Cc.)
ST5HR1-30	47	139	0.3	0.06	0.01	0.01	0.00	0.07	0.02	0.34	509.2	562.9	55.8	4.8	66.5	16.3	55.1	339.6	55.2	2.4	55.2	8.0	55.2	2.4	0.0	(Cc.)
ST5HR1-31	851	898	0.9	0.14	0.01	0.01	0.00	0.19	0.01	0.69	2267.1	101.0	62.1	3.3	174.9	12.3	54.8	197.0	54.8	1.3	54.8	4.6	54.8	1.3	0.0	(Cc.)
ST5HR1-32	118	179	0.7	0.05	0.01	0.01	0.00	0.06	0.01	0.35	363.2	505.4	55.2	4.3	61.7	13.4	54.8	279.4	54.8	2.1	54.8	6.6	54.8	2.1	0.0	(Cc.)
ST5HR1-33	91	234	0.4	0.04	0.01	0.01	0.00	0.05	0.01	0.32	-295.3	566.9	55.6	4.0	47.6	10.4	55.6	214.4	55.6	2.0	55.6	5.2	55.6	2.0	0.0	(Cc.)
ST5HR1-34	32	84	0.4	0.06	0.02	0.01	0.00	0.07	0.02	0.31	606.6	767.4	52.8	5.6	65.8	22.1	52.0	495.3	52.0	2.7	52.0	10.8	52.0	2.7	0.0	(Cc.)
ST5HR1-35	183	471	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.45	235.2	294.5	56.8	3.4	60.1	7.8	56.6	151.8	56.6	1.7	56.6	3.9	56.6	1.7	0.0	(Cc.)
ST5HR1-37	376	1441	0.3	0.05	0.00	0.01	0.00	0.08	0.01	0.60	199.5	153.7	76.3	3.8	78.9	6.4	76.1	83.5	76.1	1.9	76.1	3.2	76.1	1.9	0.0	(Cc.)
ST5HR1-38	64	81	0.8	0.08	0.02	0.01	0.00	0.09	0.03	0.39	1226.6	571.0	54.2	5.9	90.1	24.2	51.9	523.3	51.9	2.7	51.9	11.4	51.9	2.7	-0.1	(Cc.)
OD3	619	507	1.2	0.09	0.01	0.01	0.00	0.07	0.01	0.50	1486.3	285.1	34.6	2.6	66.6	9.7	32.7	305.4	32.7	1.2	32.7	4.3	32.7	1.2	0.0	(Cc.)
GJ1	18	332	0.1	0.06	0.00	0.10	0.00	0.78	0.06	0.67	561.9	111.3	605.3	29.1	588.3	33.5	607.2	57.7	607.2	14.6	607.2	16.8	607.2	14.6	0.0	(Cc.)
NIST	26	70	0.4	0.07	0.00	0.18	0.01	1.83	0.16	0.66	1024.5	136.0	1090.5	58.3	1057.0	57.9	1095.8	62.9	1095.8	29.4	1095.8	28.8	1095.8	62.9	0.0	(Cc.)
NIST	25	69	0.4	0.08	0.01	0.18	0.01	1.94	0.17	0.67	1208.6	130.6	1054.2	56.8	1093.8	58.5	1048.6	69.8	1048.6	28.1	1048.6	29.5	1048.6	69.8	0.0	(Cc.)
NIST	26	71	0.4	0.08	0.01	0.17	0.01	1.78	0.16	0.66	1097.1	137.7	1026.8	55.5	1038.0	58.0	1025.3	69.4	1025.3	27.7	1025.3	29.1	1025.3	69.4	0.0	(Cc.)
91500	26	69	0.4	0.08	0.01	0.18	0.01	1.91	0.17	0.66	1122.9	136.5	1083.0	58.7	1084.5	59.4	1082.8	67.4	1082.8	29.3	1082.8	29.7	1082.8	67.4	0.0	(Cc.)
91500	25	67	0.4	0.08	0.01	0.18	0.01	1.89	0.17	0.66	1134.2	137.9	1067.0	58.1	1077.5	59.6	1065.6	69.1	1065.6	29.0	1065.6	29.9	1065.6	69.1	0.0	(Cc.)
91500	25	68	0.4	0.08	0.01	0.18	0.01	1.86	0.17	0.66	1123.1	139.2	1056.5	57.5	1066.7	59.5	1055.1	69.7	1055.1	28.7	1055.1	29.8	1055.1	69.7	0.0	(Cc.)

ST5HR1-40	46	174	0.3	0.08	0.01	0.01	0.00	0.13	0.02	0.40	1252.4	340.6	74.5	5.1	127.8	20.7	71.2	330.4	71.2	2.4	71.2	9.8	71.2	2.4	0.0	(Cc.)
ST5HR1-41	71	179	0.4	0.05	0.01	0.01	0.00	0.05	0.01	0.29	-54.2	593.2	54.4	3.8	52.9	12.5	54.4	268.3	54.4	1.9	54.4	6.2	54.4	1.9	0.0	(Cc.)
ST5HR1-44	138	299	0.5	0.04	0.01	0.01	0.00	0.05	0.01	0.27	-522.6	578.0	56.9	3.3	46.2	9.8	56.9	201.6	56.9	1.6	56.9	4.9	56.9	1.6	0.0	(Cc.)
ST5HR1-45	122	388	0.3	0.05	0.01	0.01	0.00	0.06	0.01	0.34	331.5	350.7	51.8	2.7	59.2	9.1	51.4	203.1	51.4	1.4	51.4	4.5	51.4	1.4	0.0	(Cc.)
ST5HR1-46	710	956	0.7	0.06	0.01	0.01	0.00	0.07	0.01	0.37	512.1	205.0	57.5	2.2	70.8	7.1	56.7	142.9	56.7	1.1	56.7	3.5	56.7	1.1	0.0	(Cc.)
ST5HR1-47	97	190	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.32	347.7	509.9	56.9	4.0	65.3	14.1	56.4	291.0	56.4	2.0	56.4	7.0	56.4	2.0	0.0	(Cc.)
ST5HR1-48	76	135	0.6	0.06	0.01	0.01	0.00	0.07	0.02	0.35	623.4	525.4	54.1	4.5	70.1	16.2	53.1	348.6	53.1	2.2	53.1	7.9	53.1	2.2	0.0	(Cc.)
ST5HR1-50	65	167	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.31	336.5	555.3	52.5	3.9	60.1	14.1	52.1	315.1	52.1	1.9	52.1	7.0	52.1	1.9	0.0	(Cc.)
ST5HR1-52	70	345	0.2	0.07	0.01	0.01	0.00	0.06	0.01	0.37	904.0	341.0	39.8	2.4	59.3	9.5	38.7	276.3	38.7	1.2	38.7	4.5	38.7*	1.2*	0.0	(Cc.)
OD3	530	421	1.3	0.06	0.01	0.00	0.00	0.04	0.01	0.32	412.5	525.4	31.0	2.3	37.0	8.4	30.6	315.8	30.6	1.1	30.6	4.1	30.6	1.1	0.0	(Cc.)
GJ1	18	329	0.1	0.06	0.00	0.09	0.00	0.79	0.06	0.41	605.2	135.1	581.1	18.6	593.2	36.5	580.0	82.8	580.0	9.3	580.0	18.4	580.0	9.3	0.0	(Cc.)
NIST	26	69	0.4	0.08	0.01	0.18	0.01	1.94	0.18	0.48	1113.2	152.8	1068.9	44.3	1094.3	63.0	1065.3	86.4	1065.3	22.0	1065.3	32.0	1065.3	86.4	0.0	(Cc.)
NIST	25	67	0.4	0.08	0.01	0.18	0.01	1.92	0.18	0.48	1124.6	154.0	1053.1	44.0	1087.3	63.1	1048.3	88.4	1048.3	21.8	1048.3	32.2	1048.3	88.4	0.0	(Cc.)
NIST	25	69	0.4	0.08	0.01	0.18	0.01	1.89	0.18	0.48	1113.4	155.2	1042.7	43.5	1076.5	63.0	1038.0	88.9	1038.0	21.6	1038.0	32.1	1038.0	88.9	0.0	(Cc.)
91500	24	69	0.4	0.07	0.01	0.18	0.01	1.88	0.17	0.47	1067.8	150.9	1062.5	42.8	1074.9	61.5	1060.8	83.9	1060.8	21.3	1060.8	31.0	1060.8	83.9	0.0	(Cc.)
91500	25	68	0.4	0.07	0.01	0.18	0.01	1.78	0.17	0.47	926.6	156.9	1077.9	43.5	1039.5	61.1	1084.0	78.3	1084.0	22.0	1084.0	29.9	1084.0	78.3	0.0	(Cc.)
91500	26	69	0.4	0.07	0.01	0.18	0.01	1.80	0.17	0.47	953.0	154.9	1073.0	43.0	1044.7	60.8	1077.4	79.1	1077.4	21.7	1077.4	29.9	1077.4	79.1	0.0	(Cc.)
ST5HR1-54	99	172	0.6	0.11	0.02	0.01	0.00	0.16	0.02	0.49	1869.7	294.8	61.7	4.6	146.7	20.9	56.2	394.3	56.2	1.9	56.2	9.2	56.2	1.9	0.0	(Cc.)
ST5HR1-55	95	219	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.36	352.2	455.1	52.7	3.7	61.2	11.6	52.2	252.5	52.2	1.8	52.2	5.7	52.2	1.8	0.0	(Cc.)
ST5HR1-56	175	350	0.5	0.04	0.01	0.01	0.00	0.05	0.01	0.34	-243.3	446.4	58.2	3.4	52.9	8.9	58.2	176.2	58.2	1.7	58.2	4.5	58.2	1.7	0.0	(Cc.)
ST5HR1-57	219	961	0.2	0.05	0.01	0.01	0.00	0.07	0.01	0.43	279.5	253.1	58.2	2.7	65.4	6.9	57.7	132.5	57.7	1.3	57.7	3.4	57.7	1.3	0.0	(Cc.)
ST5HR1-58	66	123	0.5	0.17	0.05	0.01	0.00	0.25	0.06	0.55	2534.9	468.9	68.2	9.5	228.4	51.4	57.5	908.4	57.5	3.4	57.5	21.5	57.5	3.4	0.0	(Cc.)
ST5HR1-59	84	174	0.5	0.06	0.01	0.01	0.00	0.07	0.02	0.35	552.8	514.9	54.5	4.3	69.1	15.2	53.6	325.2	53.6	2.1	53.6	7.4	53.6	2.1	0.0	(Cc.)
ST5HR1-61	143	166	0.9	0.44	0.04	0.02	0.00	1.12	0.08	0.84	4067.5	117.8	113.6	6.7	762.2	38.0	55.2	445.6	55.2	0.8	55.2	10.1	55.2	0.8	0.0	(Cc.)
ST5HR1-63	204	221	0.9	0.05	0.01	0.01	0.00	0.06	0.01	0.35	322.0	462.7	53.2	3.6	61.0	11.7	52.7	254.2	52.7	1.8	52.7	5.7	52.7	1.8	0.0	(Cc.)
ST5HR1-64	72	171	0.4	0.12	0.02	0.01	0.00	0.17	0.02	0.53	1991.8	258.4	62.4	4.4	158.1	19.8	56.3	365.1	56.3	1.8	56.3	8.6	56.3	1.8	0.0	(Cc.)
OD3	595	484	1.2	0.07	0.01	0.01	0.00	0.05	0.01	0.41	910.3	386.4	33.7	2.4	51.0	8.9	32.7	298.7	32.7	1.2	32.7	4.2	32.7	1.2	0.0	(Cc.)
GJ1	17	326	0.1	0.06	0.00	0.10	0.00	0.80	0.06	0.58	564.6	142.2	591.4	22.7	597.3	31.1	590.8	61.7	590.8	11.3	590.8	15.6	590.8	11.3	0.0	(Cc.)
NIST	25	71	0.3	0.07	0.01	0.18	0.01	1.90	0.15	0.60	1064.1	153.1	1065.5	47.8	1081.9	53.8	1063.2	66.7	1063.2	23.8	1063.2	27.1	1063.2	66.7	0.0	(Cc.)
NIST	25	70	0.4	0.07	0.01	0.18	0.01	1.80	0.15	0.59	922.9	159.1	1080.9	48.5	1046.4	53.7	1086.4	62.7	1086.4	24.5	1086.4	26.5	1086.4	62.7	0.0	(Cc.)
NIST	26	71	0.4	0.07	0.01	0.18	0.01	1.82	0.15	0.59	949.3	157.1	1076.0	48.0	1051.6	53.4	1079.7	63.2	1079.7	24.2	1079.7	26.5	1079.7	63.2	0.0	(Cc.)

91500	25	69	0.4	0.07	0.01	0.18	0.01	1.87	0.15	0.60	1058.4	156.3	1053.4	48.0	1071.8	54.5	1050.8	68.3	1050.8	23.9	1050.8	27.4	1050.8	68.3	0.0	(Cc.)
91500	23	65	0.4	0.08	0.01	0.17	0.01	1.91	0.16	0.60	1139.1	155.4	1034.6	47.8	1085.6	55.2	1027.5	72.4	1027.5	23.5	1027.5	28.1	1027.5	72.4	0.0	(Cc.)
91500	23	64	0.4	0.07	0.01	0.18	0.01	1.90	0.16	0.60	1055.1	156.7	1067.6	48.8	1080.4	54.9	1065.8	67.7	1065.8	24.3	1065.8	27.6	1065.8	67.7	0.0	(Cc.)
ST5HR1-66	454	1275	0.4	0.06	0.00	0.01	0.00	0.08	0.01	0.48	529.0	168.7	61.2	2.2	74.8	5.5	60.4	98.5	60.4	1.1	60.4	2.6	60.4	1.1	0.0	(Cc.)
ST5HR1-67	271	446	0.6	0.10	0.01	0.01	0.00	0.12	0.01	0.53	1708.7	187.8	52.0	2.6	112.5	10.2	48.2	218.4	48.2	1.1	48.2	4.4	48.2	1.1	0.0	(Cc.)
ST5HR1-68	58	154	0.4	0.06	0.01	0.01	0.00	0.07	0.02	0.31	487.6	564.5	56.1	4.3	67.6	16.2	55.4	339.4	55.4	2.1	55.4	8.0	55.4	2.1	0.0	(Cc.)
ST5HR1-69	79	560	0.1	0.05	0.01	0.01	0.00	0.07	0.01	0.40	332.5	263.7	61.1	2.7	68.6	7.5	60.6	139.5	60.6	1.4	60.6	3.7	60.6	1.4	0.0	(Cc.)
ST5HR1-71	333	610	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.37	31.2	298.3	60.8	2.7	60.3	7.1	60.9	133.6	60.9	1.4	60.9	3.6	60.9	1.4	0.0	(Cc.)
ST5HR1-73	39	100	0.4	0.08	0.02	0.01	0.00	0.10	0.02	0.37	1084.6	518.6	61.4	5.6	96.8	22.8	59.2	438.1	59.2	2.6	59.2	10.9	59.2	2.6	0.1	(Cc.)
ST5HR1-74	181	649	0.3	0.05	0.01	0.01	0.00	0.07	0.01	0.41	383.8	244.3	62.1	2.7	71.2	7.3	61.5	132.8	61.5	1.3	61.5	3.6	61.5	1.3	0.0	(Cc.)
ST5HR1-75	119	155	0.8	0.13	0.02	0.01	0.00	0.17	0.02	0.55	2148.0	247.5	60.6	4.3	163.6	19.6	54.0	367.8	54.0	1.7	54.0	8.3	54.0	1.7	0.0	(Cc.)
OD3	234	222	1.1	0.17	0.03	0.01	0.00	0.16	0.02	0.60	2529.6	251.1	45.4	3.6	153.8	19.0	38.5	455.5	38.5	1.3	38.5	7.3	38.5	1.3	0.0	(Cc.)
GJ1	19	356	0.1	0.06	0.00	0.10	0.00	0.83	0.05	0.61	671.6	114.9	595.3	19.6	612.9	26.2	593.7	51.0	593.7	9.8	593.7	13.1	593.7	9.8	0.0	(Cc.)
NIST	25	72	0.4	0.07	0.01	0.18	0.01	1.86	0.13	0.62	1052.1	136.7	1071.2	44.1	1067.1	47.7	1071.8	56.6	1071.8	22.1	1071.8	23.8	1071.8	56.6	0.0	(Cc.)
NIST	23	67	0.3	0.08	0.01	0.18	0.01	1.90	0.14	0.62	1132.8	136.2	1052.2	43.9	1080.9	48.4	1048.2	60.0	1048.2	21.8	1048.2	24.4	1048.2	60.0	0.0	(Cc.)
NIST	24	66	0.4	0.07	0.01	0.18	0.01	1.88	0.14	0.62	1048.8	137.1	1085.7	44.8	1075.6	48.1	1087.1	56.2	1087.1	22.5	1087.1	24.0	1087.1	56.2	0.0	(Cc.)
91500	27	71	0.4	0.08	0.01	0.18	0.01	1.89	0.14	0.62	1112.5	136.5	1058.7	44.1	1078.6	48.3	1055.9	59.2	1055.9	21.9	1055.9	24.3	1055.9	59.2	0.0	(Cc.)
91500	26	71	0.4	0.07	0.01	0.18	0.01	1.83	0.14	0.61	1042.7	141.1	1059.4	44.4	1056.1	48.7	1059.9	58.7	1059.9	22.2	1059.9	24.3	1059.9	58.7	0.0	(Cc.)
91500	26	72	0.4	0.08	0.01	0.18	0.01	1.84	0.14	0.61	1071.9	139.1	1051.0	43.7	1059.9	48.3	1049.7	59.3	1049.7	21.8	1049.7	24.2	1049.7	59.3	0.0	(Cc.)
ST5HR1-80	117	373	0.3	0.06	0.01	0.01	0.00	0.07	0.01	0.37	572.0	322.3	56.4	3.1	70.4	10.2	55.5	209.2	55.5	1.5	55.5	5.0	55.5	1.5	0.0	(Cc.)
ST5HR1-81	364	574	0.6	0.05	0.01	0.01	0.00	0.05	0.01	0.34	16.2	333.7	54.6	2.6	53.9	7.5	54.8	158.4	54.8	1.3	54.8	3.8	54.8	1.3	0.0	(Cc.)
ST5HR1-83	79	234	0.3	0.09	0.01	0.01	0.00	0.11	0.02	0.43	1381.8	296.1	58.6	3.8	106.8	15.5	55.6	307.6	55.6	1.7	55.6	7.2	55.6	1.7	0.0	(Cc.)
ST5HR1-84	232	789	0.3	0.06	0.01	0.01	0.00	0.08	0.01	0.40	703.2	214.3	59.5	2.6	78.6	8.2	58.3	157.8	58.3	1.3	58.3	3.9	58.3	1.3	0.0	(Cc.)
ST5HR1-85	625	819	0.8	0.05	0.01	0.01	0.00	0.06	0.01	0.36	54.8	282.0	54.3	2.4	54.4	6.6	54.3	138.9	54.3	1.2	54.3	3.3	54.3	1.2	0.0	(Cc.)
ST5HR1-86	64	85	0.8	0.06	0.02	0.01	0.00	0.08	0.03	0.29	551.9	775.5	66.1	6.6	81.3	27.2	65.1	491.9	65.2	3.2	65.1	13.4	65.2	3.2	-0.1	(Cc.)
ST5HR1-87	56	94	0.6	0.43	0.04	0.02	0.00	1.12	0.10	0.78	4013.0	141.0	120.7	8.5	762.5	48.9	62.7	620.5	62.7	1.2	62.7	15.9	62.7	1.2	0.0	(Cc.)
ST5HR1-88	102	271	0.4	0.05	0.01	0.01	0.00	0.07	0.01	0.34	367.3	417.1	57.8	3.6	65.9	11.8	57.3	237.0	57.3	1.8	57.3	5.8	57.3	1.8	0.0	(Cc.)
ST5HR1-89	72	231	0.3	0.05	0.01	0.01	0.00	0.07	0.01	0.33	387.3	484.8	57.3	4.0	65.9	13.6	56.8	277.7	56.8	2.0	56.8	6.7	56.8	2.0	0.0	(Cc.)
ST5HR1-90	252	410	0.6	0.06	0.01	0.01	0.00	0.06	0.01	0.35	454.5	366.1	50.8	3.0	60.4	9.7	50.2	221.1	50.2	1.5	50.2	4.8	50.2	1.5	0.0	(Cc.)
ST5HR1-91	125	363	0.3	0.06	0.01	0.01	0.00	0.07	0.01	0.35	435.7	375.1	54.4	3.2	64.0	10.5	53.8	223.2	53.8	1.6	53.8	5.1	53.8	1.6	0.0	(Cc.)
OD3	81	135	0.6	0.26	0.04	0.01	0.00	0.26	0.04	0.69	3252.0	265.7	47.0	4.8	237.4	31.6	34.2	724.1	34.3	1.3	34.2	10.3	34.3	1.3	-0.1	(Cc.)

GJ1	19	356	0.1	0.06	0.00	0.09	0.00	0.82	0.06	0.48	758.4	121.1	567.3	19.6	607.8	34.7	563.5	79.7	563.5	9.7	563.5	17.6	563.5	9.7	0.0	(Cc.)
NIST	27	70	0.4	0.08	0.01	0.18	0.01	1.89	0.17	0.52	1126.4	144.8	1053.5	45.4	1078.6	59.4	1050.0	80.0	1050.0	22.6	1050.0	30.1	1050.0	80.0	0.0	(Cc.)
NIST	25	70	0.4	0.07	0.01	0.18	0.01	1.83	0.17	0.52	1056.7	149.2	1054.2	45.7	1056.2	59.5	1053.9	78.3	1053.9	22.9	1053.9	29.8	1053.9	78.3	0.0	(Cc.)
NIST	26	71	0.4	0.08	0.01	0.18	0.01	1.84	0.17	0.52	1085.8	147.3	1045.8	45.1	1059.9	59.3	1043.8	79.5	1043.8	22.5	1043.8	29.8	1043.8	79.5	0.0	(Cc.)
91500	26	71	0.4	0.07	0.01	0.18	0.01	1.79	0.16	0.51	977.4	149.5	1073.6	45.8	1043.5	58.7	1078.2	73.8	1078.2	23.1	1078.2	28.9	1078.2	73.8	0.0	(Cc.)
91500	26	73	0.4	0.08	0.01	0.18	0.01	1.90	0.17	0.52	1069.2	144.7	1084.5	46.3	1080.6	59.2	1085.1	75.7	1085.1	23.2	1085.1	29.5	1085.1	75.7	0.0	(Cc.)
91500	24	69	0.3	0.08	0.01	0.18	0.01	1.95	0.17	0.52	1159.3	143.0	1066.6	45.9	1098.7	59.8	1062.1	80.2	1062.1	22.7	1062.1	30.4	1062.1	80.2	0.0	(Cc.)
ST5HR1-93	89	215	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.36	403.1	505.2	49.2	3.9	57.6	12.6	48.7	294.4	48.7	1.9	48.7	6.2	48.7	1.9	0.0	(Cc.)
ST5HR1-94	257	417	0.6	0.05	0.01	0.01	0.00	0.07	0.01	0.41	339.1	338.6	56.6	3.6	64.3	9.6	56.2	191.8	56.2	1.8	56.2	4.7	56.2	1.8	0.0	(Cc.)
ST5HR1-95	86	198	0.4	0.07	0.01	0.01	0.00	0.08	0.02	0.41	955.9	421.2	51.3	4.2	77.0	15.1	49.7	338.9	49.7	2.0	49.7	7.2	49.7	2.0	0.0	(Cc.)
ST5HR1-96	24	67	0.4	0.07	0.03	0.01	0.00	0.10	0.03	0.36	1067.5	675.5	62.0	7.3	97.4	30.2	59.7	578.4	59.7	3.4	59.7	14.5	59.7	3.4	-0.1	(Cc.)
ST5HR1-97	230	1856	0.1	0.05	0.00	0.01	0.00	0.07	0.01	0.52	241.4	179.6	58.9	2.9	64.0	5.9	58.5	105.3	58.5	1.5	58.5	2.9	58.5	1.5	0.0	(Cc.)
ST5HR1-98	128	134	1.0	0.06	0.02	0.01	0.00	0.08	0.02	0.37	749.6	521.4	57.7	5.1	78.4	18.3	56.4	370.7	56.4	2.5	56.4	8.9	56.4	2.5	0.0	(Cc.)
ST5HR1-99	608	907	0.7	0.05	0.00	0.01	0.00	0.06	0.01	0.46	48.7	253.5	55.1	3.0	55.4	6.3	55.0	125.6	55.0	1.5	55.0	3.2	55.0	1.5	0.0	(Cc.)
ST5HR1-100	189	354	0.5	0.06	0.01	0.01	0.00	0.08	0.01	0.43	765.7	317.9	57.3	3.8	78.5	11.7	56.0	230.8	56.0	1.8	56.0	5.6	56.0	1.8	0.0	(Cc.)
ST5HR1-101	429	369	1.2	0.08	0.01	0.01	0.00	0.10	0.01	0.48	1166.5	252.6	58.8	3.8	97.2	12.4	56.4	235.6	56.4	1.7	56.4	5.7	56.4	1.7	0.0	(Cc.)
ST5HR1-102	144	551	0.3	0.05	0.01	0.01	0.00	0.06	0.01	0.39	-26.8	368.5	57.5	3.5	56.0	8.6	57.5	169.2	57.5	1.8	57.5	4.3	57.5	1.8	0.0	(Cc.)
ST5HR1-103	111	146	0.8	0.07	0.02	0.01	0.00	0.08	0.02	0.40	853.4	468.0	51.4	4.5	73.5	15.7	50.0	350.6	50.0	2.2	50.0	7.5	50.0	2.2	0.0	(Cc.)
ST5HR1-104	263	219	1.2	0.07	0.02	0.01	0.00	0.07	0.02	0.36	838.7	569.5	46.8	4.5	66.7	17.3	45.6	429.4	45.6	2.2	45.6	8.3	45.6	2.2	0.0	(Cc.)
OD3	539	490	1.1	0.05	0.01	0.00	0.00	0.03	0.01	0.34	204.3	542.8	32.0	2.5	34.7	7.9	31.8	284.9	31.8	1.3	31.8	3.9	31.8	1.3	0.0	(Cc.)
GJ1	17	339	0.0	0.06	0.00	0.10	0.00	0.81	0.07	0.58	615.5	136.6	593.6	28.2	602.1	38.8	592.7	76.6	592.7	14.1	592.7	19.4	592.7	14.1	0.0	(Cc.)
NIST	25	70	0.4	0.07	0.01	0.18	0.01	1.80	0.18	0.59	971.8	157.9	1073.8	57.0	1046.5	63.8	1078.0	75.7	1078.0	28.7	1078.0	31.6	1078.0	75.7	0.0	(Cc.)
NIST	25	71	0.4	0.07	0.01	0.18	0.01	1.91	0.18	0.60	1063.7	153.1	1084.7	57.5	1083.6	64.4	1084.9	77.7	1084.9	28.8	1084.9	32.2	1084.9	77.7	0.0	(Cc.)
NIST	23	68	0.3	0.08	0.01	0.18	0.01	1.96	0.19	0.60	1153.8	151.3	1066.8	56.9	1101.8	65.0	1061.9	82.3	1061.9	28.2	1061.9	33.0	1061.9	82.3	0.0	(Cc.)
91500	26	71	0.4	0.08	0.01	0.17	0.01	1.79	0.17	0.59	1072.7	150.9	1020.2	53.7	1042.8	62.3	1017.2	80.7	1017.2	26.7	1017.2	31.4	1017.2	80.7	0.0	(Cc.)
91500	25	73	0.3	0.08	0.01	0.18	0.01	1.91	0.18	0.60	1106.6	148.0	1063.1	55.7	1083.4	63.2	1060.3	79.0	1060.3	27.7	1060.3	31.9	1060.3	79.0	0.0	(Cc.)
91500	27	74	0.4	0.07	0.01	0.18	0.01	1.84	0.18	0.59	1020.1	152.2	1069.3	56.1	1059.0	63.0	1070.8	76.2	1070.8	28.1	1070.8	31.4	1070.8	76.2	0.0	(Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 76
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age}) / (^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

B.6 Beppo Formation (ST7BP4)

U-Pb LA-ICP-MS Detrital Zircon Data of Beppo Formation

Sample Location: Station-7, Akkeshi Bay Area, Eastern Hokkaido, Japan

Formation / Group: Beppo Formation / Uraho Group

Belt: Nemuro Belt

Sample Type: Sandstone (coarse sandstone)

Grain Number	Th (PPM)	U (PPM)	Th/U	Isotopic Ratios							U-Pb Age (Ma)										Preferred Age	± 2σ	Disc. (%)			
											<i>before Stacey-Kramers Correction</i>					<i>after Stacey-Kramers Correction</i>										
				207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ	Error Corr.	207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ	207Pb/206Pb	± 2σ	206Pb/238U	± 2σ					207Pb/235U	± 2σ
ST7BP4-1	162	208	0.8	0.04	0.01	0.01	0.00	0.05	0.01	0.33	-154.9	438.8	49.4	2.9	45.7	7.9	49.4	183.4	49.4	1.4	49.4	4.0	49.4	1.4	0.0	(Cc.)
ST7BP4-2	49	126	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.35	117.0	483.0	57.3	4.0	58.9	11.5	57.2	231.2	57.2	2.0	57.2	5.7	57.2	2.0	0.0	(Cc.)
ST7BP4-3	130	666	0.2	0.05	0.00	0.01	0.00	0.06	0.01	0.34	163.5	213.7	55.3	1.9	58.0	5.7	55.2	119.9	55.2	1.0	55.2	2.9	55.2	1.0	0.0	(Cc.)
ST7BP4-4	25	79	0.3	0.05	0.01	0.01	0.00	0.07	0.02	0.36	258.9	544.8	60.0	5.0	65.3	14.5	59.6	278.9	59.6	2.5	59.6	7.2	59.6	2.5	0.0	(Cc.)
ST7BP4-5	38	78	0.5	0.06	0.01	0.01	0.00	0.07	0.02	0.35	483.3	541.2	59.6	4.9	71.4	16.4	58.8	321.7	58.8	2.4	58.8	8.1	58.8	2.4	0.0	(Cc.)
ST7BP4-6	94	296	0.3	0.05	0.01	0.01	0.00	0.07	0.01	0.35	223.8	281.0	61.7	2.8	66.2	8.1	61.5	151.8	61.5	1.4	61.5	4.0	61.5	1.4	0.0	(Cc.)
ST7BP4-7	725	503	1.4	0.05	0.01	0.01	0.00	0.05	0.01	0.34	12.8	260.5	49.9	2.0	49.3	5.6	50.0	128.5	50.0	1.0	50.0	2.8	50.0	1.0	0.0	(Cc.)
ST7BP4-8	52	229	0.2	0.07	0.01	0.01	0.00	0.08	0.01	0.39	787.4	270.6	59.5	3.1	81.9	10.3	58.2	200.1	58.2	1.5	58.2	5.0	58.2	1.5	0.0	(Cc.)
ST7BP4-9	81	190	0.4	0.07	0.01	0.01	0.00	0.09	0.01	0.40	826.3	298.1	59.7	3.4	83.5	11.5	58.2	221.4	58.2	1.6	58.2	5.5	58.2	1.6	0.0	(Cc.)
ST7BP4-10	30	56	0.5	0.04	0.01	0.01	0.00	0.06	0.02	0.29	-159.3	814.0	66.7	6.2	61.2	19.0	66.7	332.9	66.7	3.1	66.7	9.5	66.7	3.1	0.0	(Cc.)
ST7BP4-11	37	94	0.4	0.04	0.01	0.01	0.00	0.06	0.01	0.30	-224.5	646.6	62.1	4.7	55.6	13.7	62.1	256.2	62.2	2.3	62.2	6.9	62.2	2.3	0.0	(Cc.)
ST7BP4-13	40	88	0.5	0.29	0.02	0.02	0.00	0.61	0.05	0.67	3410.5	129.3	97.6	5.5	483.1	32.5	67.9	458.9	67.9	1.3	67.9	12.7	67.9	1.3	0.0	(Cc.)
OD3	990	784	1.3	0.05	0.01	0.01	0.00	0.04	0.00	0.35	283.1	234.5	32.7	1.3	36.4	4.0	32.5	138.3	32.5	0.6	32.5	2.0	32.5	0.6	0.0	(Cc.)
GJ1	19	360	0.1	0.06	0.00	0.10	0.00	0.83	0.05	0.36	650.0	84.4	599.5	13.3	611.6	30.1	598.4	68.1	598.4	6.7	598.4	15.2	598.4	6.7	0.0	(Cc.)
NIST	25	71	0.4	0.07	0.00	0.18	0.01	1.88	0.14	0.41	1062.8	104.9	1075.2	29.5	1073.2	48.6	1075.4	67.1	1075.4	14.8	1075.4	24.3	1075.4	67.1	0.0	(Cc.)
NIST	26	71	0.4	0.08	0.00	0.18	0.01	1.95	0.14	0.41	1168.7	102.6	1059.3	29.3	1097.8	49.1	1053.8	71.3	1053.8	14.5	1053.8	25.2	1053.8	71.3	0.0	(Cc.)
NIST	26	72	0.4	0.08	0.00	0.18	0.01	1.90	0.14	0.41	1088.8	105.9	1072.5	29.8	1080.0	49.1	1071.5	68.5	1071.5	14.9	1071.5	24.7	1071.5	68.5	0.0	(Cc.)
91500	28	75	0.4	0.08	0.00	0.18	0.01	1.87	0.14	0.41	1084.6	105.4	1058.3	29.3	1069.1	48.7	1056.8	68.9	1056.8	14.6	1056.8	24.5	1056.8	68.9	0.0	(Cc.)
91500	25	70	0.4	0.07	0.00	0.18	0.01	1.82	0.14	0.41	1022.8	108.6	1062.7	29.6	1051.8	48.7	1064.2	67.2	1064.2	14.8	1064.2	24.2	1064.2	67.2	0.0	(Cc.)
91500	26	70	0.4	0.07	0.00	0.18	0.01	1.80	0.13	0.41	1029.5	107.4	1050.3	29.1	1045.6	48.3	1050.9	67.7	1050.9	14.6	1050.9	24.1	1050.9	67.7	0.0	(Cc.)
ST7BP4-14	397	1971	0.2	0.05	0.00	0.01	0.00	0.06	0.00	0.48	20.3	132.6	57.7	2.2	58.1	4.5	57.7	84.1	57.7	1.1	57.7	2.3	57.7	1.1	0.0	(Cc.)

ST7BP4-16	138	193	0.7	0.05	0.01	0.01	0.00	0.06	0.01	0.39	304.1	380.7	50.5	3.3	57.4	9.4	50.1	212.6	50.1	1.6	50.1	4.6	50.1	1.6	0.0	(Cc.)
ST7BP4-17	161	393	0.4	0.12	0.01	0.01	0.00	0.16	0.01	0.54	1906.1	141.1	62.5	3.1	150.9	13.0	56.8	234.2	56.8	1.3	56.8	5.6	56.8	1.3	0.0	(Cc.)
ST7BP4-18	625	6005	0.1	0.05	0.00	0.01	0.00	0.06	0.00	0.50	183.9	110.2	54.0	2.0	58.2	4.3	53.7	84.1	53.7	1.0	53.7	2.1	53.7	1.0	0.0	(Cc.)
ST7BP4-19	389	1457	0.3	0.05	0.00	0.01	0.00	0.06	0.01	0.48	156.7	143.3	56.2	2.2	59.9	4.9	56.0	93.8	56.0	1.1	56.0	2.4	56.0	1.1	0.0	(Cc.)
ST7BP4-20	52	119	0.4	0.07	0.01	0.01	0.00	0.09	0.02	0.43	889.3	350.7	60.2	4.3	88.4	14.3	58.5	271.8	58.5	2.0	58.5	6.8	58.5	2.0	0.0	(Cc.)
ST7BP4-21	128	758	0.2	0.06	0.00	0.01	0.00	0.09	0.01	0.47	424.8	166.5	71.9	3.1	85.2	7.6	71.1	116.3	71.1	1.5	71.1	3.7	71.1	1.5	0.0	(Cc.)
ST7BP4-22	269	820	0.3	0.06	0.01	0.01	0.00	0.05	0.01	0.42	502.6	261.7	41.9	2.3	52.2	6.5	41.3	172.0	41.3	1.1	41.3	3.1	41.3	1.1	0.0	(Cc.)
ST7BP4-24	250	248	1.0	0.09	0.01	0.01	0.00	0.08	0.01	0.48	1335.8	233.5	44.6	2.7	82.0	9.9	42.3	247.1	42.3	1.2	42.3	4.4	42.3	1.2	0.0	(Cc.)
ST7BP4-26	137	216	0.6	0.07	0.01	0.01	0.00	0.09	0.02	0.44	920.7	386.5	56.1	4.5	83.8	14.8	54.4	298.5	54.4	2.1	54.4	7.0	54.4	2.1	0.0	(Cc.)
OD3	395	372	1.1	0.06	0.01	0.01	0.00	0.05	0.01	0.42	642.5	293.2	34.2	2.0	45.5	6.3	33.5	205.3	33.5	1.0	33.5	3.0	33.5	1.0	0.0	(Cc.)
GJ1	19	355	0.1	0.06	0.00	0.09	0.00	0.81	0.06	0.52	629.2	84.8	580.0	20.7	600.5	32.2	578.1	68.9	578.1	10.3	578.1	16.2	578.1	10.3	0.0	(Cc.)
NIST	28	75	0.4	0.07	0.00	0.18	0.01	1.87	0.15	0.53	1056.6	106.5	1054.8	40.8	1070.6	52.2	1052.7	69.0	1052.7	20.3	1052.7	26.3	1052.7	69.0	0.0	(Cc.)
NIST	25	70	0.4	0.07	0.00	0.18	0.01	1.82	0.14	0.53	994.5	109.7	1059.2	41.1	1053.3	52.2	1060.0	67.3	1060.0	20.6	1060.0	26.0	1060.0	67.3	0.0	(Cc.)
NIST	26	70	0.4	0.07	0.00	0.18	0.01	1.80	0.14	0.53	1001.3	108.6	1046.8	40.5	1047.1	51.8	1046.8	67.9	1046.8	20.2	1046.8	25.9	1046.8	67.9	0.0	(Cc.)
91500	26	71	0.4	0.08	0.00	0.18	0.01	1.92	0.15	0.53	1083.0	106.0	1070.3	41.4	1089.8	52.7	1067.5	69.2	1067.5	20.6	1067.5	26.6	1067.5	69.2	0.0	(Cc.)
91500	27	75	0.4	0.07	0.00	0.18	0.01	1.95	0.15	0.53	1064.4	105.2	1094.0	42.1	1099.5	52.7	1093.3	67.1	1093.3	21.0	1093.3	26.4	1093.3	67.1	0.0	(Cc.)
91500	29	79	0.4	0.07	0.00	0.18	0.01	1.83	0.15	0.53	1019.3	108.3	1053.0	40.8	1057.1	52.1	1052.4	68.2	1052.4	20.4	1052.4	26.1	1052.4	68.2	0.0	(Cc.)
ST7BP4-27	227	658	0.3	0.05	0.00	0.01	0.00	0.06	0.01	0.46	235.7	203.6	56.5	2.8	61.6	6.5	56.2	125.1	56.2	1.4	56.2	3.2	56.2	1.4	0.0	(Cc.)
ST7BP4-28	755	803	0.9	0.05	0.00	0.01	0.00	0.07	0.01	0.47	137.5	185.1	63.5	3.0	66.1	6.5	63.3	111.6	63.3	1.5	63.3	3.2	63.3	1.5	0.0	(Cc.)
ST7BP4-30	50	110	0.5	0.13	0.02	0.01	0.00	0.19	0.02	0.56	2040.5	221.3	69.4	5.1	176.6	21.1	62.4	344.9	62.4	2.1	62.4	9.0	62.4	2.1	0.0	(Cc.)
ST7BP4-32	143	179	0.8	0.05	0.01	0.01	0.00	0.05	0.01	0.41	337.5	408.4	46.7	3.5	53.3	9.5	46.3	229.4	46.3	1.7	46.3	4.7	46.3	1.7	0.0	(Cc.)
ST7BP4-33	27	49	0.5	0.06	0.02	0.01	0.00	0.06	0.02	0.35	698.7	796.3	40.8	5.2	54.9	19.3	40.0	547.1	40.0	2.5	40.0	9.3	40.0	2.5	0.0	(Cc.)
ST7BP4-34	404	308	1.3	0.08	0.01	0.01	0.00	0.08	0.01	0.48	1157.5	231.1	45.2	2.8	75.3	9.3	43.4	226.6	43.4	1.3	43.4	4.2	43.4	1.3	0.0	(Cc.)
ST7BP4-37	58	140	0.4	0.05	0.01	0.01	0.00	0.07	0.01	0.38	85.5	433.3	66.2	4.6	67.5	12.2	66.1	210.4	66.2	2.3	66.2	6.1	66.2	2.3	0.0	(Cc.)
ST7BP4-38	55	141	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.38	217.8	437.9	58.5	4.3	63.1	11.8	58.2	229.7	58.2	2.1	58.2	5.8	58.2	2.1	0.0	(Cc.)
ST7BP4-39	113	303	0.4	0.06	0.01	0.01	0.00	0.07	0.01	0.43	421.2	280.2	56.7	3.3	66.8	8.9	56.1	174.8	56.1	1.6	56.1	4.3	56.1	1.6	0.0	(Cc.)
OD3	376	359	1.0	0.06	0.01	0.00	0.00	0.04	0.01	0.44	718.4	306.4	30.8	2.1	42.0	6.2	30.1	222.9	30.1	1.0	30.1	2.9	30.1	1.0	0.0	(Cc.)
GJ1	20	364	0.1	0.06	0.00	0.10	0.00	0.80	0.07	0.53	591.3	98.3	592.5	24.6	597.3	36.9	592.1	75.7	592.1	12.3	592.1	18.5	592.1	12.3	0.0	(Cc.)
NIST	26	71	0.4	0.08	0.00	0.18	0.01	1.92	0.17	0.54	1093.8	115.1	1073.5	47.1	1087.6	59.1	1071.5	76.6	1071.5	23.5	1071.5	29.7	1071.5	76.6	0.0	(Cc.)
NIST	27	75	0.4	0.08	0.00	0.19	0.01	1.95	0.17	0.54	1075.2	114.4	1097.3	47.9	1097.4	59.2	1097.3	74.4	1097.3	24.0	1097.3	29.6	1097.3	74.4	0.0	(Cc.)
NIST	29	79	0.4	0.07	0.00	0.18	0.01	1.83	0.16	0.54	1030.1	117.4	1056.1	46.4	1055.0	58.3	1056.3	75.4	1056.3	23.2	1056.3	29.1	1056.3	75.4	0.0	(Cc.)
91500	28	76	0.4	0.08	0.00	0.18	0.01	1.90	0.17	0.54	1107.0	115.2	1059.6	46.6	1082.7	59.0	1056.4	77.9	1056.4	23.1	1056.4	29.8	1056.4	77.9	0.0	(Cc.)

91500	27	75	0.4	0.07	0.00	0.17	0.01	1.75	0.16	0.53	986.7	119.2	1037.8	45.6	1028.7	57.7	1039.0	75.0	1039.0	22.9	1039.0	28.7	1039.0	75.0	0.0	(Cc.)
91500	26	71	0.4	0.07	0.00	0.18	0.01	1.86	0.17	0.54	1067.3	118.2	1053.8	46.6	1065.6	58.9	1052.2	77.3	1052.2	23.2	1052.2	29.6	1052.2	77.3	0.0	(Cc.)
ST7BP4-40	242	1555	0.2	0.05	0.00	0.01	0.00	0.06	0.00	0.36	218.8	133.8	59.0	1.7	63.0	4.7	58.7	92.4	58.7	0.8	58.7	2.4	58.7	0.8	0.0	(Cc.)
ST7BP4-42	195	782	0.2	0.05	0.00	0.01	0.00	0.06	0.01	0.36	105.2	195.7	55.1	1.9	56.2	5.2	55.0	109.2	55.0	0.9	55.0	2.6	55.0	0.9	0.0	(Cc.)
ST7BP4-44	248	246	1.0	0.06	0.01	0.01	0.00	0.05	0.01	0.37	413.3	349.0	40.2	2.3	47.0	7.2	39.8	204.3	39.8	1.2	39.8	3.5	39.8*	1.2*	0.0	(Cc.)
ST7BP4-45	43	102	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.33	109.4	542.9	62.4	4.6	63.5	13.9	62.3	259.8	62.3	2.3	62.3	7.0	62.3	2.3	0.0	(Cc.)
ST7BP4-46	28	75	0.4	0.07	0.01	0.01	0.00	0.09	0.02	0.43	1045.0	407.3	59.3	4.9	91.6	17.0	57.3	328.5	57.3	2.3	57.3	8.0	57.3	2.3	0.0	(Cc.)
ST7BP4-47	115	229	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.37	404.8	314.4	55.9	3.0	64.7	9.0	55.4	184.2	55.4	1.5	55.4	4.4	55.4	1.5	0.0	(Cc.)
ST7BP4-48	42	95	0.4	0.05	0.01	0.01	0.00	0.07	0.02	0.37	364.8	484.0	62.0	4.8	70.3	14.2	61.5	264.1	61.5	2.4	61.5	7.0	61.5	2.4	0.0	(Cc.)
ST7BP4-49	113	276	0.4	0.08	0.01	0.01	0.00	0.12	0.01	0.43	1300.3	189.6	68.6	3.1	119.0	11.8	65.4	201.0	65.4	1.4	65.4	5.5	65.4	1.4	0.0	(Cc.)
ST7BP4-50	32	83	0.4	0.05	0.01	0.01	0.00	0.07	0.02	0.34	381.3	548.8	60.8	4.9	69.5	16.0	60.3	306.6	60.3	2.4	60.3	7.9	60.3	2.4	0.0	(Cc.)
ST7BP4-51	112	178	0.6	0.09	0.01	0.01	0.00	0.08	0.01	0.44	1373.4	300.6	44.1	3.0	80.8	11.9	41.8	307.0	41.8	1.3	41.8	5.4	41.8	1.3	0.0	(Cc.)
ST7BP4-52	520	552	0.9	0.05	0.01	0.01	0.00	0.05	0.01	0.37	301.2	236.7	46.7	1.9	51.9	5.7	46.4	139.3	46.4	0.9	46.4	2.8	46.4	0.9	0.0	(Cc.)
OD3	323	311	1.0	0.07	0.01	0.01	0.00	0.05	0.01	0.42	1009.5	285.0	34.0	2.0	52.5	7.2	32.9	238.8	32.9	0.9	32.9	3.4	32.9	0.9	0.0	(Cc.)
GJ1	20	364	0.1	0.06	0.00	0.10	0.00	0.83	0.05	0.38	713.2	79.3	587.2	14.2	613.5	30.2	584.7	69.8	584.7	7.0	584.7	15.4	584.7	7.0	0.0	(Cc.)
NIST	28	77	0.4	0.08	0.00	0.18	0.01	1.94	0.14	0.43	1132.3	101.9	1076.0	31.4	1094.3	49.5	1073.4	69.0	1073.4	15.6	1073.4	25.1	1073.4	69.0	0.0	(Cc.)
NIST	28	76	0.4	0.07	0.00	0.18	0.01	1.79	0.13	0.42	1012.4	105.8	1053.8	30.7	1040.0	48.6	1055.8	66.6	1055.8	15.4	1055.8	24.1	1055.8	66.6	0.0	(Cc.)
NIST	27	72	0.4	0.08	0.00	0.18	0.01	1.89	0.14	0.43	1092.8	105.1	1070.1	31.6	1077.2	49.6	1069.1	68.6	1069.1	15.7	1069.1	24.9	1069.1	68.6	0.0	(Cc.)
91500	28	76	0.4	0.07	0.00	0.18	0.01	1.83	0.14	0.43	1060.0	105.3	1052.8	30.9	1054.7	49.0	1052.5	68.2	1052.5	15.5	1052.5	24.5	1052.5	68.2	0.0	(Cc.)
91500	27	73	0.4	0.08	0.00	0.18	0.01	1.88	0.14	0.43	1084.1	104.7	1071.0	31.5	1074.9	49.5	1070.5	68.2	1070.5	15.7	1070.5	24.8	1070.5	68.2	0.0	(Cc.)
91500	26	74	0.4	0.08	0.00	0.18	0.01	1.89	0.14	0.43	1122.2	103.5	1054.5	31.0	1076.4	49.3	1051.5	70.1	1051.5	15.4	1051.5	25.0	1051.5	70.1	0.0	(Cc.)
ST7BP4-55	96	201	0.5	0.04	0.01	0.01	0.00	0.06	0.01	0.31	-360.3	429.8	68.5	3.6	57.5	9.6	68.5	161.7	68.5	1.8	68.5	4.8	68.5	1.8	0.0	(Cc.)
ST7BP4-60	581	395	1.5	0.05	0.01	0.01	0.00	0.04	0.01	0.35	244.1	301.2	40.6	2.0	43.8	5.9	40.4	167.8	40.4	1.0	40.4	2.9	40.4	1.0	0.0	(Cc.)
ST7BP4-61	72	162	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.33	184.4	425.7	59.1	3.6	61.7	11.1	58.9	216.9	58.9	1.8	58.9	5.5	58.9	1.8	0.0	(Cc.)
OD3	473	485	1.0	0.06	0.01	0.00	0.00	0.04	0.01	0.36	448.8	306.5	30.9	1.6	36.7	5.2	30.6	190.9	30.6	0.8	30.6	2.5	30.6	0.8	0.0	(Cc.)
GJ1	20	359	0.1	0.06	0.00	0.10	0.00	0.84	0.06	0.33	728.1	95.9	591.4	14.4	616.5	35.2	589.0	82.3	589.0	7.1	589.0	17.9	589.0	7.1	0.0	(Cc.)
NIST	27	75	0.4	0.07	0.00	0.18	0.01	1.82	0.15	0.38	1049.6	117.0	1063.0	31.3	1053.0	54.9	1064.4	76.7	1064.4	15.7	1064.4	27.3	1064.4	76.7	0.0	(Cc.)
NIST	26	72	0.4	0.08	0.00	0.18	0.01	1.88	0.16	0.38	1073.8	116.4	1081.4	31.8	1073.2	55.5	1082.6	76.6	1082.6	15.9	1082.6	27.6	1082.6	76.6	0.0	(Cc.)
NIST	26	73	0.4	0.08	0.00	0.18	0.01	1.88	0.16	0.38	1111.9	115.1	1064.8	31.3	1074.6	55.4	1063.4	78.8	1063.4	15.6	1063.4	27.9	1063.4	78.8	0.0	(Cc.)
91500	27	75	0.4	0.08	0.00	0.18	0.01	1.98	0.16	0.39	1226.0	112.2	1058.9	31.4	1109.2	56.1	1051.8	83.6	1051.8	15.5	1051.8	29.1	1051.8	83.6	0.0	(Cc.)
91500	27	71	0.4	0.07	0.00	0.18	0.01	1.80	0.15	0.38	1026.6	119.1	1060.7	31.5	1044.0	55.0	1063.1	76.4	1063.1	15.8	1063.1	27.2	1063.1	76.4	0.0	(Cc.)
91500	28	74	0.4	0.08	0.00	0.18	0.01	1.85	0.16	0.38	1109.0	116.3	1049.4	31.1	1063.2	55.3	1047.5	79.8	1047.5	15.5	1047.5	27.9	1047.5	79.8	0.0	(Cc.)

ST7BP4-66	33	94	0.3	0.04	0.01	0.01	0.00	0.05	0.01	0.29	-360.8	711.5	59.9	4.9	50.6	13.8	59.9	267.0	59.9	2.5	59.9	6.9	59.9	2.5	0.0	(Cc.)
ST7BP4-67	21	50	0.4	0.06	0.02	0.01	0.00	0.08	0.02	0.38	515.8	594.6	67.0	6.8	80.7	20.8	66.1	357.8	66.2	3.3	66.1	10.2	66.2	3.3	-0.1	(Cc.)
ST7BP4-69	62	198	0.3	0.05	0.01	0.01	0.00	0.05	0.01	0.34	46.3	420.8	53.1	3.4	52.8	9.7	53.2	210.7	53.2	1.7	53.2	4.9	53.2	1.7	0.0	(Cc.)
ST7BP4-70	63	229	0.3	0.04	0.01	0.01	0.00	0.06	0.01	0.33	-138.7	410.8	59.0	3.5	54.4	9.6	59.0	186.7	59.1	1.7	59.1	4.8	59.1	1.7	0.0	(Cc.)
ST7BP4-71	19	59	0.3	0.07	0.02	0.01	0.00	0.08	0.02	0.41	802.1	536.1	58.3	6.0	80.3	19.5	57.0	383.2	57.0	2.9	57.0	9.3	57.0	2.9	0.0	(Cc.)
ST7BP4-72	25	72	0.3	0.05	0.02	0.01	0.00	0.06	0.02	0.32	236.4	693.4	59.1	5.7	63.4	18.4	58.9	363.8	58.9	2.8	58.9	9.2	58.9	2.8	0.0	(Cc.)
ST7BP4-73	23	71	0.3	0.06	0.01	0.01	0.00	0.07	0.02	0.38	504.5	557.4	58.3	5.6	70.2	17.1	57.6	337.6	57.6	2.7	57.6	8.4	57.6	2.7	0.0	(Cc.)
ST7BP4-74	39	91	0.4	0.05	0.01	0.01	0.00	0.07	0.02	0.32	48.8	581.4	64.9	5.2	64.3	15.4	64.9	276.7	64.9	2.6	64.9	7.7	64.9	2.6	0.0	(Cc.)
ST7BP4-75	127	365	0.3	0.04	0.01	0.01	0.00	0.05	0.01	0.34	-79.2	309.3	56.2	2.8	53.1	7.7	56.2	156.7	56.2	1.4	56.2	3.9	56.2	1.4	0.0	(Cc.)
ST7BP4-76	124	240	0.5	0.04	0.01	0.01	0.00	0.06	0.01	0.33	-171.1	367.7	68.1	3.7	61.7	9.9	68.1	167.7	68.1	1.9	68.1	5.0	68.1	1.9	0.0	(Cc.)
ST7BP4-77	199	534	0.4	0.05	0.00	0.01	0.00	0.06	0.01	0.36	148.3	231.5	57.3	2.6	59.3	7.3	57.2	146.9	57.2	1.3	57.2	3.7	57.2	1.3	0.0	(Cc.)
ST7BP4-78	104	173	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.36	199.1	391.8	56.0	3.6	59.2	10.4	55.8	213.8	55.8	1.8	55.8	5.2	55.8	1.8	0.0	(Cc.)
OD3	388	404	1.0	0.07	0.01	0.01	0.00	0.05	0.01	0.39	845.7	270.5	33.6	2.0	47.9	6.9	32.7	234.6	32.7	0.9	32.7	3.3	32.7	0.9	0.0	(Cc.)
GJ1	20	370	0.1	0.06	0.00	0.10	0.00	0.83	0.08	0.37	608.7	91.2	618.1	20.6	614.6	44.0	618.4	95.0	618.4	10.3	618.4	21.9	618.4	10.3	0.0	(Cc.)
NIST	27	74	0.4	0.08	0.00	0.18	0.01	2.02	0.20	0.40	1221.7	107.7	1075.7	39.8	1122.9	68.7	1069.0	100.0	1069.0	19.6	1069.0	35.5	1069.0	100.0	0.0	(Cc.)
NIST	26	71	0.4	0.07	0.00	0.18	0.01	1.83	0.19	0.39	1022.2	114.7	1077.5	39.9	1057.2	67.1	1080.5	91.1	1080.5	20.1	1080.5	33.1	1080.5	91.1	0.0	(Cc.)
NIST	27	74	0.4	0.08	0.00	0.18	0.01	1.89	0.19	0.39	1104.6	111.8	1066.0	39.4	1076.6	67.5	1064.5	95.5	1064.5	19.7	1064.5	34.0	1064.5	95.5	0.0	(Cc.)
91500	27	74	0.4	0.08	0.00	0.18	0.01	1.87	0.19	0.40	1131.3	110.9	1043.8	38.7	1070.4	67.2	1040.2	98.2	1040.2	19.2	1040.2	34.2	1040.2	98.2	0.0	(Cc.)
91500	28	77	0.4	0.07	0.00	0.18	0.01	1.79	0.18	0.39	1045.3	115.2	1042.7	38.8	1041.4	66.6	1042.9	94.6	1042.9	19.4	1042.9	33.3	1042.9	94.6	0.0	(Cc.)
91500	26	72	0.4	0.07	0.00	0.18	0.01	1.81	0.18	0.39	1003.6	115.3	1072.4	39.6	1047.9	66.8	1076.1	90.7	1076.1	20.0	1076.1	32.8	1076.1	90.7	0.0	(Cc.)
ST7BP4-80	22	55	0.4	0.06	0.02	0.01	0.00	0.08	0.02	0.41	603.3	586.7	64.3	6.6	82.1	20.1	63.2	358.5	63.2	3.2	63.2	9.7	63.2	3.2	0.0	(Cc.)
ST7BP4-81	69	205	0.3	0.04	0.01	0.01	0.00	0.05	0.01	0.35	-136.7	431.9	55.7	3.3	52.4	8.7	55.7	178.5	55.8	1.7	55.8	4.4	55.8	1.7	0.0	(Cc.)
ST7BP4-83	179	399	0.4	0.07	0.01	0.01	0.00	0.09	0.01	0.49	1020.9	188.6	58.8	2.7	91.3	8.0	56.7	151.0	56.8	1.2	56.8	3.7	56.8	1.2	0.0	(Cc.)
ST7BP4-84	145	330	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.40	288.3	297.1	56.7	2.9	63.4	7.8	56.3	156.2	56.3	1.4	56.3	3.8	56.3	1.4	0.0	(Cc.)
ST7BP4-87	49	78	0.6	0.06	0.01	0.01	0.00	0.08	0.02	0.37	559.4	506.9	64.8	5.4	81.2	17.3	63.8	309.9	63.8	2.6	63.8	8.4	63.8	2.6	0.0	(Cc.)
ST7BP4-89	170	605	0.3	0.05	0.00	0.01	0.00	0.06	0.01	0.43	187.1	219.7	54.9	2.2	58.9	5.5	54.6	110.3	54.7	1.1	54.7	2.7	54.7	1.1	0.0	(Cc.)
ST7BP4-90	233	480	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.42	251.8	238.2	57.6	2.5	63.4	6.4	57.2	123.4	57.3	1.2	57.3	3.1	57.3	1.2	0.0	(Cc.)
OD3	453	463	1.0	0.06	0.01	0.01	0.00	0.05	0.01	0.44	630.5	271.2	35.2	1.9	46.3	5.5	34.6	174.0	34.6	0.9	34.6	2.6	34.6	0.9	0.0	(Cc.)
GJ1	20	357	0.1	0.06	0.00	0.10	0.00	0.83	0.04	0.62	591.7	82.2	613.1	17.7	616.2	22.6	612.8	42.0	612.8	8.8	612.8	11.3	612.8	8.8	0.0	(Cc.)
NIST	27	74	0.4	0.08	0.00	0.18	0.01	1.91	0.11	0.60	1127.2	104.6	1047.2	34.9	1084.5	40.1	1042.0	51.4	1042.0	17.3	1042.0	20.3	1042.0	51.4	0.0	(Cc.)
NIST	28	76	0.4	0.07	0.00	0.18	0.01	1.83	0.11	0.59	1041.1	108.9	1046.1	35.0	1055.3	40.3	1044.8	50.7	1044.8	17.5	1044.8	20.2	1044.8	50.7	0.0	(Cc.)

NIST	26	71	0.4	0.07	0.00	0.18	0.01	1.85	0.11	0.59	999.4	109.0	1075.9	35.8	1061.8	40.3	1078.0	48.5	1078.0	18.0	1078.0	20.0	1078.0	48.5	0.0	(Cc.)
91500	26	71	0.4	0.07	0.00	0.18	0.01	1.85	0.11	0.59	1024.8	108.4	1064.6	35.5	1062.5	40.3	1064.8	49.4	1064.8	17.8	1064.8	20.1	1064.8	49.4	0.0	(Cc.)
91500	27	74	0.4	0.08	0.00	0.18	0.01	1.91	0.12	0.59	1073.1	107.8	1074.0	36.0	1084.8	40.8	1072.5	50.2	1072.5	17.9	1072.5	20.5	1072.5	50.2	0.0	(Cc.)
91500	26	72	0.4	0.07	0.00	0.18	0.01	1.87	0.11	0.60	1033.0	106.8	1070.4	35.5	1069.1	40.0	1070.6	48.7	1070.6	17.8	1070.6	20.0	1070.6	48.7	0.0	(Cc.)
ST7BP4-94	27	69	0.4	0.06	0.01	0.01	0.00	0.07	0.02	0.41	432.9	562.4	57.7	5.6	69.6	16.1	56.9	315.8	56.9	2.7	56.9	7.8	56.9	2.7	0.0	(Cc.)
ST7BP4-95	18	51	0.3	0.06	0.02	0.01	0.00	0.09	0.02	0.42	698.1	578.8	61.6	6.6	83.4	20.4	60.2	377.0	60.2	3.2	60.2	9.8	60.2	3.2	0.0	(Cc.)
ST7BP4-96	52	89	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.38	45.1	534.4	61.6	5.0	63.1	13.1	61.5	241.3	61.5	2.5	61.5	6.5	61.5	2.5	0.0	(Cc.)
ST7BP4-98	42	313	0.1	0.05	0.01	0.01	0.00	0.06	0.01	0.44	-3.9	313.0	58.5	3.3	58.9	7.3	58.5	136.5	58.5	1.6	58.5	3.6	58.5	1.6	0.0	(Cc.)
ST7BP4-100	430	580	0.7	0.05	0.01	0.01	0.00	0.05	0.00	0.48	68.0	253.6	44.7	2.3	46.5	4.8	44.5	115.3	44.5	1.1	44.5	2.4	44.5	1.1	0.0	(Cc.)
ST7BP4-101	348	669	0.5	0.06	0.00	0.01	0.00	0.08	0.01	0.58	611.8	169.7	57.9	2.7	75.7	5.8	56.8	102.1	56.8	1.3	56.8	2.7	56.8	1.3	0.0	(Cc.)
ST7BP4-102	104	203	0.5	0.05	0.01	0.01	0.00	0.07	0.01	0.44	401.6	349.8	56.8	3.7	67.8	9.8	56.2	192.3	56.2	1.8	56.2	4.8	56.2	1.8	0.0	(Cc.)
ST7BP4-103	77	133	0.6	0.05	0.01	0.01	0.00	0.07	0.01	0.38	68.0	460.4	66.3	4.7	68.4	12.4	66.1	212.5	66.2	2.3	66.2	6.2	66.2	2.3	0.0	(Cc.)
ST7BP4-104	407	1145	0.4	0.06	0.00	0.01	0.00	0.07	0.01	0.61	427.4	150.4	58.1	2.5	70.0	4.8	57.4	80.4	57.4	1.2	57.4	2.2	57.4	1.2	0.0	(Cc.)
OD3	542	555	1.0	0.06	0.01	0.01	0.00	0.04	0.00	0.49	497.0	261.2	33.7	1.9	42.3	4.8	33.1	152.4	33.1	0.9	33.1	2.3	33.1	0.9	0.0	(Cc.)
GJ1	19	359	0.1	0.06	0.00	0.10	0.00	0.84	0.04	0.83	604.2	80.5	608.0	22.7	621.9	21.8	606.7	28.9	606.7	11.3	606.7	10.8	606.7	11.3	0.0	(Cc.)
NIST	26	71	0.4	0.07	0.00	0.18	0.01	1.84	0.11	0.74	1006.8	108.1	1052.9	42.6	1058.7	39.2	1052.0	41.1	1052.0	21.3	1052.0	19.6	1052.0	41.1	0.0	(Cc.)
NIST	27	75	0.4	0.07	0.00	0.18	0.01	1.90	0.11	0.74	1055.2	107.5	1062.2	43.2	1080.9	39.7	1059.6	41.7	1059.6	21.5	1059.6	19.9	1059.6	41.7	0.0	(Cc.)
NIST	26	73	0.4	0.07	0.00	0.18	0.01	1.86	0.11	0.74	1015.0	106.5	1058.7	42.7	1065.3	38.9	1057.8	40.3	1057.8	21.3	1057.8	19.5	1057.8	40.3	0.0	(Cc.)
91500	28	75	0.4	0.08	0.00	0.18	0.01	1.87	0.11	0.75	1070.6	105.0	1041.0	42.1	1071.5	38.9	1036.8	41.4	1036.8	20.9	1036.8	19.4	1036.8	41.4	0.0	(Cc.)
91500	26	71	0.4	0.07	0.00	0.19	0.01	1.91	0.11	0.74	1002.3	107.5	1094.3	44.2	1085.0	39.6	1095.6	39.5	1095.6	22.1	1095.6	19.8	1095.6	39.5	0.0	(Cc.)
91500	27	75	0.4	0.07	0.00	0.18	0.01	1.83	0.11	0.74	966.6	108.2	1069.1	43.1	1056.7	39.0	1070.9	39.7	1070.9	21.6	1070.9	19.5	1070.9	39.7	0.0	(Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 73
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age}) / (^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

B.7 Shiomi Formation (ST4SH2)

U-Pb LA-ICP-MS Detrital Zircon Data of Shiomi Formation																										
Sample Location: Station-4, Akkeshi Bay Area, Eastern Hokkaido, Japan																										
Formation / Group: Shiomi Formation / Nemuro Group																										
Belt: Nemuro Belt																										
Sample Type: Sandstone (fine sandstone)																										
Grain Number	Th (PPM)	U (PPM)	Th /U	Isotopic Ratios							U-Pb Age (Ma)						U-Pb Age (Ma)						Preferr ed Age	± 2σ	Disc. (%)	
											before Stacey-Kramers Correction						after Stacey-Kramers Correction									
				207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	Error Corr.	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ				
ST4SH2-2	86	251	0.3	0.05	0.01	0.01	0.00	0.06	0.01	0.41	148.7	343.2	57.7	3.5	60.7	8.8	57.5	170.6	57.5	1.7	57.5	4.4	57.5	1.7	0.0	(Cc.)
ST4SH2-3	74	321	0.2	0.05	0.01	0.01	0.00	0.06	0.01	0.41	184.6	314.9	54.7	3.1	58.5	7.9	54.5	162.5	54.5	1.6	54.5	3.9	54.5	1.6	0.0	(Cc.)
ST4SH2-4	122	406	0.3	0.04	0.01	0.01	0.00	0.05	0.01	0.41	-138.9	300.4	57.1	3.0	53.5	6.7	57.1	129.7	57.1	1.5	57.1	3.4	57.1	1.5	0.0	(Cc.)
ST4SH2-5	46	152	0.3	0.05	0.01	0.01	0.00	0.07	0.01	0.38	276.3	431.6	58.6	4.2	65.0	11.8	58.2	229.1	58.2	2.1	58.2	5.8	58.2	2.1	0.0	(Cc.)
ST4SH2-6	52	101	0.5	0.05	0.01	0.01	0.00	0.05	0.01	0.34	7.7	621.9	54.0	4.6	53.7	13.3	54.1	282.6	54.1	2.3	54.1	6.6	54.1	2.3	0.0	(Cc.)
ST4SH2-7	385	625	0.6	0.12	0.01	0.01	0.00	0.17	0.01	0.59	1964.7	107.5	64.8	2.9	159.6	11.4	58.7	191.4	58.7	1.2	58.7	4.7	58.7	1.2	0.0	(Cc.)
ST4SH2-8	57	130	0.4	0.06	0.01	0.01	0.00	0.07	0.01	0.39	449.2	452.0	56.4	4.3	67.5	13.1	55.7	264.5	55.7	2.1	55.7	6.4	55.7	2.1	0.0	(Cc.)
ST4SH2-9	145	613	0.2	0.15	0.01	0.01	0.00	0.21	0.02	0.62	2304.4	102.3	64.4	3.0	189.8	13.1	56.2	224.4	56.2	1.1	56.2	5.3	56.2	1.1	0.0	(Cc.)
ST4SH2-10	285	395	0.7	0.05	0.01	0.01	0.00	0.06	0.01	0.43	89.2	271.0	60.1	3.1	61.6	7.3	60.0	134.0	60.0	1.6	60.0	3.6	60.0	1.6	0.0	(Cc.)
ST4SH2-11	34	100	0.3	0.06	0.01	0.01	0.00	0.07	0.02	0.38	481.9	514.2	54.8	4.7	66.5	14.6	54.1	306.1	54.1	2.3	54.1	7.1	54.1	2.3	0.0	(Cc.)
ST4SH2-12	530	859	0.6	0.05	0.00	0.01	0.00	0.06	0.01	0.47	83.8	199.6	57.1	2.6	58.5	5.5	57.1	104.6	57.1	1.3	57.1	2.7	57.1	1.3	0.0	(Cc.)
ST4SH2-13	119	297	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.43	222.1	299.7	57.4	3.3	62.2	8.1	57.1	157.4	57.1	1.6	57.1	4.0	57.1	1.6	0.0	(Cc.)
OD3	274	283	1.0	0.06	0.01	0.01	0.00	0.05	0.01	0.42	587.0	347.8	35.3	2.3	45.3	7.1	34.6	225.4	34.7	1.1	34.7	3.4	34.7	1.1	0.0	(Cc.)
GJ1	20	367	0.1	0.06	0.00	0.10	0.00	0.82	0.06	0.58	616.6	87.7	598.9	22.5	608.8	30.8	597.9	60.4	597.9	11.2	597.9	15.4	597.9	11.2	0.0	(Cc.)
NIST	27	74	0.4	0.08	0.00	0.17	0.01	1.83	0.14	0.58	1081.3	111.0	1032.2	42.0	1056.9	50.1	1028.8	65.6	1028.8	20.9	1028.8	25.3	1028.8	65.6	0.0	(Cc.)
NIST	25	70	0.4	0.07	0.00	0.18	0.01	1.87	0.14	0.57	1013.0	113.5	1085.0	44.1	1070.3	50.9	1087.2	61.7	1087.2	22.1	1087.2	25.3	1087.2	61.7	0.0	(Cc.)
NIST	26	74	0.4	0.07	0.00	0.18	0.01	1.79	0.14	0.57	977.5	114.2	1060.1	43.0	1042.2	50.1	1062.7	61.7	1062.7	21.6	1062.7	24.9	1062.7	61.7	0.0	(Cc.)
91500	25	68	0.4	0.07	0.00	0.18	0.01	1.88	0.14	0.58	1048.3	111.0	1075.4	43.6	1075.4	50.6	1075.4	62.5	1075.4	21.8	1075.4	25.3	1075.4	62.5	0.0	(Cc.)
91500	26	74	0.3	0.08	0.00	0.18	0.01	1.96	0.15	0.58	1162.8	107.8	1057.4	43.0	1101.5	50.9	1051.2	66.5	1051.2	21.2	1051.2	25.9	1051.2	66.5	0.0	(Cc.)
91500	26	74	0.3	0.07	0.00	0.18	0.01	1.87	0.14	0.58	1050.3	111.3	1068.1	43.3	1071.2	50.5	1067.6	63.0	1067.6	21.6	1067.6	25.3	1067.6	63.0	0.0	(Cc.)
ST4SH2-14	150	313	0.5	0.06	0.01	0.01	0.00	0.08	0.01	0.42	661.9	246.9	59.3	2.9	76.0	8.5	58.3	162.7	58.3	1.4	58.3	4.1	58.3	1.4	0.0	(Cc.)

ST4SH2-15	256	568	0.5	0.08	0.01	0.01	0.00	0.11	0.01	0.49	1183.0	147.4	62.3	2.5	101.7	7.9	59.9	141.4	59.9	1.1	59.9	3.6	59.9	1.1	0.0	(Cc.)
ST4SH2-16	135	268	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.39	320.9	312.9	55.1	2.9	60.9	8.1	54.7	167.7	54.7	1.4	54.7	4.0	54.7	1.4	0.0	(Cc.)
ST4SH2-17	134	87	1.5	0.11	0.01	0.03	0.00	0.36	0.04	0.53	1719.8	192.4	161.0	8.8	314.7	28.1	150.0	219.0	150.0	3.8	150.0	13.5	150.0	3.8	0.0	(Cc.)
ST4SH2-18	81	291	0.3	0.06	0.01	0.01	0.00	0.07	0.01	0.41	484.0	274.8	54.6	2.8	64.9	7.8	54.0	161.7	54.0	1.4	54.0	3.8	54.0	1.4	0.0	(Cc.)
ST4SH2-19	288	474	0.6	0.07	0.01	0.01	0.00	0.08	0.01	0.45	844.5	184.1	58.9	2.5	82.1	7.4	57.5	140.0	57.5	1.2	57.5	3.5	57.5	1.2	0.0	(Cc.)
ST4SH2-20	222	516	0.4	0.05	0.00	0.01	0.00	0.06	0.01	0.40	104.4	237.9	55.9	2.4	56.5	5.8	55.9	115.6	55.9	1.2	55.9	2.9	55.9	1.2	0.0	(Cc.)
ST4SH2-21	177	577	0.3	0.05	0.00	0.01	0.00	0.05	0.01	0.39	-43.7	241.1	55.9	2.3	53.1	5.4	55.9	108.4	55.9	1.1	55.9	2.7	55.9	1.1	0.0	(Cc.)
ST4SH2-22	83	149	0.6	0.04	0.01	0.01	0.00	0.06	0.01	0.36	-127.0	451.5	59.2	3.8	54.4	9.5	59.2	183.0	59.2	1.9	59.2	4.8	59.2	1.9	0.0	(Cc.)
ST4SH2-24	674	901	0.7	0.05	0.00	0.01	0.00	0.06	0.01	0.42	86.4	195.9	55.4	2.1	55.6	4.9	55.4	97.7	55.4	1.0	55.4	2.4	55.4	1.0	0.0	(Cc.)
ST4SH2-25	49	254	0.2	0.12	0.01	0.01	0.00	0.15	0.01	0.54	1902.5	173.5	60.0	3.1	140.6	12.7	54.8	236.9	54.8	1.3	54.8	5.5	54.8	1.3	0.0	(Cc.)
ST4SH2-26	782	4047	0.2	0.05	0.00	0.01	0.00	0.05	0.00	0.49	119.6	98.8	52.1	1.5	53.0	3.1	52.0	62.7	52.1	0.8	52.1	1.5	52.1*	0.8*	0.0	(Cc.)
OD3	133	160	0.8	0.07	0.01	0.00	0.00	0.05	0.01	0.42	1049.8	401.6	31.6	2.5	49.4	9.2	30.5	325.5	30.5	1.2	30.5	4.3	30.5	1.2	0.0	(Cc.)
GJ1	19	354	0.1	0.06	0.00	0.10	0.00	0.78	0.05	0.51	548.2	88.4	598.7	17.2	583.7	26.0	600.4	52.5	600.4	8.6	600.4	12.9	600.4	8.6	0.0	(Cc.)
NIST	25	67	0.4	0.07	0.00	0.18	0.01	1.82	0.12	0.53	1048.7	109.4	1065.6	35.2	1053.2	44.6	1067.4	57.1	1067.4	17.7	1067.4	22.2	1067.4	57.1	0.0	(Cc.)
NIST	25	73	0.4	0.08	0.00	0.18	0.01	1.89	0.13	0.53	1163.1	106.2	1047.8	34.8	1078.9	44.9	1043.4	60.6	1043.4	17.2	1043.4	22.8	1043.4	60.6	0.0	(Cc.)
NIST	25	72	0.3	0.07	0.00	0.18	0.01	1.81	0.12	0.53	1050.7	109.7	1058.3	35.0	1049.0	44.6	1059.6	57.6	1059.6	17.5	1059.6	22.2	1059.6	57.6	0.0	(Cc.)
91500	28	76	0.4	0.08	0.00	0.18	0.01	1.92	0.13	0.53	1138.2	105.0	1073.2	35.2	1087.9	44.7	1071.1	58.4	1071.1	17.5	1071.1	22.5	1071.1	58.4	0.0	(Cc.)
91500	28	79	0.4	0.08	0.00	0.18	0.01	1.85	0.12	0.53	1114.7	106.4	1051.2	34.6	1065.1	44.4	1049.2	58.9	1049.2	17.3	1049.2	22.4	1049.2	58.9	0.0	(Cc.)
91500	27	74	0.4	0.08	0.00	0.18	0.01	1.91	0.13	0.53	1108.0	106.8	1082.2	35.6	1083.8	45.0	1082.0	57.6	1082.0	17.8	1082.0	22.5	1082.0	57.6	0.0	(Cc.)
ST4SH2-27	131	191	0.7	0.09	0.01	0.01	0.00	0.11	0.01	0.58	1380.9	243.0	59.1	4.2	105.9	12.4	56.2	220.2	56.2	1.9	56.2	5.4	56.2	1.9	0.0	(Cc.)
ST4SH2-28	190	629	0.3	0.05	0.00	0.01	0.00	0.05	0.01	0.56	84.5	229.4	54.5	3.1	54.3	5.4	54.5	99.6	54.5	1.5	54.5	2.7	54.5	1.5	0.0	(Cc.)
ST4SH2-29	80	276	0.3	0.06	0.01	0.01	0.00	0.07	0.01	0.52	490.2	283.8	55.0	3.6	65.2	8.1	54.4	155.6	54.4	1.8	54.4	3.9	54.4	1.8	0.0	(Cc.)
ST4SH2-30	98	395	0.2	0.05	0.01	0.01	0.00	0.06	0.01	0.53	180.2	264.3	55.8	3.4	57.9	6.5	55.7	121.3	55.7	1.7	55.7	3.2	55.7	1.7	0.0	(Cc.)
ST4SH2-32	141	293	0.5	0.07	0.01	0.01	0.00	0.09	0.01	0.57	878.0	236.5	58.9	3.8	82.9	9.1	57.4	160.2	57.4	1.8	57.4	4.1	57.4	1.8	0.0	(Cc.)
ST4SH2-33	164	444	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.53	106.8	255.8	57.7	3.4	58.0	6.3	57.7	112.4	57.7	1.7	57.7	3.1	57.7	1.7	0.0	(Cc.)
ST4SH2-34	89	127	0.7	0.05	0.01	0.01	0.00	0.07	0.01	0.42	167.7	439.5	70.5	5.4	72.3	12.8	70.4	203.7	70.4	2.7	70.4	6.4	70.4	2.7	0.0	(Cc.)
ST4SH2-37	217	608	0.4	0.07	0.01	0.01	0.00	0.08	0.01	0.65	876.8	170.5	58.6	3.3	82.5	6.9	57.1	113.5	57.1	1.6	57.1	3.1	57.1	1.6	0.0	(Cc.)
ST4SH2-38	80	368	0.2	0.05	0.01	0.01	0.00	0.06	0.01	0.50	132.3	294.0	53.6	3.3	54.5	6.7	53.5	133.0	53.5	1.7	53.5	3.3	53.5	1.7	0.0	(Cc.)
ST4SH2-39	143	404	0.4	0.08	0.01	0.01	0.00	0.10	0.01	0.64	1135.4	178.4	60.7	3.6	96.4	8.5	58.4	137.7	58.4	1.7	58.4	3.7	58.4	1.7	0.0	(Cc.)
OD3	224	259	0.9	0.06	0.01	0.01	0.00	0.05	0.01	0.46	632.7	363.8	35.3	2.7	45.0	7.2	34.7	223.0	34.7	1.3	34.7	3.4	34.7	1.3	0.0	(Cc.)
GJ1	20	374	0.1	0.06	0.00	0.09	0.00	0.79	0.05	0.86	641.7	88.4	583.8	27.7	588.9	25.9	583.3	33.0	583.3	13.8	583.3	12.9	583.3	13.8	0.0	(Cc.)
NIST	28	77	0.4	0.08	0.00	0.18	0.01	1.91	0.13	0.79	1114.7	107.2	1082.4	52.9	1082.9	44.5	1082.4	40.8	1082.4	26.5	1082.4	22.3	1082.4	40.8	0.0	(Cc.)

NIST	28	80	0.4	0.08	0.00	0.18	0.01	1.84	0.12	0.79	1091.0	108.6	1060.3	52.0	1060.2	44.2	1060.3	41.4	1060.3	26.0	1060.3	22.1	1060.3	41.4	0.0	(Cc.)
NIST	27	75	0.4	0.08	0.00	0.18	0.01	1.89	0.13	0.79	1084.3	109.0	1091.5	53.5	1078.9	44.8	1093.4	40.6	1093.4	26.8	1093.4	22.4	1093.4	40.6	0.0	(Cc.)
91500	26	75	0.4	0.08	0.00	0.18	0.01	1.91	0.13	0.79	1160.1	108.3	1064.2	52.4	1085.8	45.0	1061.1	42.9	1061.1	26.1	1061.1	22.5	1061.1	42.9	0.0	(Cc.)
91500	26	74	0.3	0.08	0.00	0.18	0.01	1.86	0.13	0.79	1122.8	109.6	1055.1	52.0	1067.2	44.7	1053.4	42.7	1053.4	25.9	1053.4	22.3	1053.4	42.7	0.0	(Cc.)
91500	27	76	0.4	0.08	0.00	0.17	0.01	1.79	0.12	0.78	1112.2	111.6	1024.5	50.7	1042.8	44.6	1022.0	44.4	1022.0	25.2	1022.0	22.3	1022.0	44.4	0.0	(Cc.)
ST4SH2-41	81	331	0.2	0.05	0.01	0.01	0.00	0.06	0.01	0.39	63.2	315.4	56.2	3.0	56.5	7.6	56.2	152.4	56.2	1.5	56.2	3.8	56.2	1.5	0.0	(Cc.)
ST4SH2-42	504	689	0.7	0.05	0.00	0.01	0.00	0.05	0.01	0.42	24.2	224.6	54.4	2.4	53.8	5.5	54.5	112.7	54.5	1.2	54.5	2.8	54.5	1.2	0.0	(Cc.)
ST4SH2-43	221	582	0.4	0.05	0.00	0.01	0.00	0.06	0.01	0.42	55.3	231.4	58.0	2.6	58.0	6.1	58.0	116.9	58.0	1.3	58.0	3.1	58.0	1.3	0.0	(Cc.)
ST4SH2-44	216	639	0.3	0.05	0.00	0.01	0.00	0.06	0.01	0.42	153.7	225.6	56.5	2.6	58.9	6.2	56.4	121.2	56.4	1.3	56.4	3.1	56.4	1.3	0.0	(Cc.)
ST4SH2-45	86	294	0.3	0.06	0.01	0.01	0.00	0.07	0.01	0.42	507.2	281.6	57.8	3.2	70.1	9.0	57.1	176.0	57.1	1.6	57.1	4.4	57.1	1.6	0.0	(Cc.)
ST4SH2-46	258	718	0.4	0.05	0.00	0.01	0.00	0.06	0.01	0.42	95.6	226.1	54.3	2.4	55.4	5.8	54.3	117.9	54.3	1.2	54.3	2.9	54.3	1.2	0.0	(Cc.)
ST4SH2-47	127	318	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.41	316.6	291.1	56.2	3.1	62.8	8.1	55.8	162.3	55.8	1.5	55.8	4.0	55.8	1.5	0.0	(Cc.)
ST4SH2-48	70	256	0.3	0.05	0.01	0.01	0.00	0.06	0.01	0.40	210.3	337.2	57.2	3.4	61.0	8.8	56.9	173.8	56.9	1.7	56.9	4.4	56.9	1.7	0.0	(Cc.)
ST4SH2-50	59	230	0.3	0.05	0.01	0.01	0.00	0.06	0.01	0.38	32.8	377.3	56.5	3.4	56.1	8.7	56.6	174.3	56.6	1.7	56.6	4.4	56.6	1.7	0.0	(Cc.)
ST4SH2-51	140	351	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.41	224.6	287.3	56.0	3.0	60.1	7.6	55.7	152.7	55.7	1.5	55.7	3.8	55.7	1.5	0.0	(Cc.)
OD3	399	418	1.0	0.05	0.01	0.01	0.00	0.04	0.01	0.39	257.5	353.0	33.1	2.0	36.4	5.6	32.9	190.1	32.9	1.0	32.9	2.7	32.9	1.0	0.0	(Cc.)
GJ1	18	339	0.1	0.06	0.00	0.10	0.00	0.81	0.06	0.51	574.9	102.4	608.2	21.2	602.1	32.9	608.8	66.6	608.8	10.6	608.8	16.4	608.8	10.6	0.0	(Cc.)
NIST	27	76	0.4	0.08	0.00	0.18	0.01	1.97	0.16	0.52	1166.9	116.5	1071.6	41.1	1104.8	53.8	1066.8	72.2	1066.8	20.4	1066.8	27.4	1066.8	72.2	0.0	(Cc.)
NIST	26	75	0.3	0.08	0.00	0.18	0.01	1.91	0.15	0.52	1129.6	117.7	1062.5	40.8	1086.0	53.4	1059.1	71.5	1059.1	20.3	1059.1	27.0	1059.1	71.5	0.0	(Cc.)
NIST	27	76	0.4	0.08	0.00	0.17	0.01	1.84	0.15	0.52	1119.0	119.7	1031.7	39.8	1061.3	53.1	1027.6	73.2	1027.6	19.8	1027.6	27.0	1027.6	73.2	0.0	(Cc.)
91500	22	67	0.3	0.07	0.00	0.18	0.01	1.83	0.15	0.51	1014.9	125.2	1076.4	41.8	1057.6	53.9	1079.3	68.5	1079.3	21.0	1079.3	26.7	1079.3	68.5	0.0	(Cc.)
91500	27	77	0.3	0.07	0.00	0.18	0.01	1.81	0.15	0.51	986.7	124.3	1075.4	41.4	1047.8	53.3	1079.6	67.2	1079.6	20.9	1079.6	26.3	1079.6	67.2	0.0	(Cc.)
91500	25	72	0.3	0.07	0.00	0.18	0.01	1.84	0.15	0.52	1054.4	121.0	1060.6	40.8	1059.9	53.2	1060.7	69.6	1060.7	20.4	1060.7	26.6	1060.7	69.6	0.0	(Cc.)
ST4SH2-53	64	236	0.3	0.05	0.01	0.01	0.00	0.06	0.01	0.36	289.0	329.3	56.1	2.9	62.0	8.6	55.7	175.7	55.7	1.4	55.7	4.2	55.7	1.4	0.0	(Cc.)
ST4SH2-54	130	423	0.3	0.05	0.01	0.01	0.00	0.06	0.01	0.36	263.6	257.9	57.1	2.4	62.4	6.9	56.8	139.7	56.8	1.2	56.8	3.4	56.8	1.2	0.0	(Cc.)
ST4SH2-56	141	218	0.6	0.04	0.01	0.01	0.00	0.06	0.01	0.32	-124.8	399.4	60.1	3.1	55.9	8.7	60.1	168.2	60.1	1.6	60.1	4.4	60.1	1.6	0.0	(Cc.)
ST4SH2-57	51	120	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.36	137.0	483.1	57.7	4.1	59.8	11.6	57.6	230.2	57.6	2.0	57.6	5.8	57.6	2.0	0.0	(Cc.)
ST4SH2-58	252	551	0.5	0.07	0.01	0.01	0.00	0.12	0.01	0.40	908.5	152.7	83.1	2.7	119.1	9.2	80.9	129.9	80.9	1.3	80.9	4.4	80.9	1.3	0.0	(Cc.)
ST4SH2-59	388	490	0.8	0.06	0.01	0.01	0.00	0.08	0.01	0.38	656.9	204.0	60.9	2.3	78.9	7.5	59.8	142.7	59.8	1.1	59.8	3.7	59.8	1.1	0.0	(Cc.)
ST4SH2-60	276	565	0.5	0.06	0.01	0.01	0.00	0.07	0.01	0.37	525.8	204.7	54.5	2.0	66.8	6.3	53.8	133.8	53.8	1.0	53.8	3.1	53.8	1.0	0.0	(Cc.)
ST4SH2-61	136	237	0.6	0.06	0.01	0.01	0.00	0.07	0.01	0.36	429.7	314.4	60.0	3.0	70.3	9.5	59.3	183.1	59.3	1.5	59.3	4.7	59.3	1.5	0.0	(Cc.)
ST4SH2-62	445	502	0.9	0.06	0.01	0.01	0.00	0.08	0.01	0.39	638.1	193.7	60.1	2.2	77.2	7.1	59.0	135.2	59.1	1.1	59.1	3.4	59.1	1.1	0.0	(Cc.)

ST4SH2-63	202	513	0.4	0.05	0.00	0.01	0.00	0.06	0.01	0.35	87.8	243.9	57.2	2.1	58.1	6.0	57.2	121.5	57.2	1.1	57.2	3.0	57.2	1.1	0.0	(Cc.)
ST4SH2-64	113	286	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.36	366.1	323.4	54.3	2.8	62.0	8.6	53.8	181.9	53.8	1.4	53.8	4.2	53.8	1.4	0.0	(Cc.)
ST4SH2-65	93	259	0.4	0.07	0.01	0.01	0.00	0.09	0.01	0.40	911.6	252.3	61.1	3.0	88.8	10.4	59.3	196.5	59.3	1.4	59.3	5.0	59.3	1.4	0.0	(Cc.)
OD3	235	260	0.9	0.07	0.01	0.01	0.00	0.05	0.01	0.43	1038.5	324.0	33.1	2.2	52.1	7.8	32.0	265.4	32.0	1.0	32.0	3.6	32.0	1.0	0.0	(Cc.)
GJ1	20	360	0.1	0.06	0.00	0.10	0.00	0.80	0.05	0.38	584.1	93.0	600.3	13.1	598.3	27.1	600.5	59.7	600.5	6.5	600.5	13.5	600.5	6.5	0.0	(Cc.)
NIST	23	67	0.3	0.07	0.00	0.18	0.01	1.85	0.13	0.43	1042.2	117.3	1068.6	30.4	1061.9	46.7	1069.6	63.4	1069.6	15.2	1069.6	23.2	1069.6	63.4	0.0	(Cc.)
NIST	27	77	0.3	0.07	0.00	0.18	0.01	1.82	0.13	0.43	1014.1	116.3	1067.6	29.9	1052.1	46.1	1069.8	62.2	1069.8	15.0	1069.8	22.8	1069.8	62.2	0.0	(Cc.)
NIST	25	72	0.3	0.08	0.00	0.18	0.01	1.85	0.13	0.43	1081.5	113.0	1052.9	29.3	1064.2	45.8	1051.4	64.2	1051.4	14.6	1051.4	23.1	1051.4	64.2	0.0	(Cc.)
91500	28	77	0.4	0.08	0.00	0.18	0.01	1.86	0.13	0.44	1080.7	114.3	1056.5	29.7	1066.4	46.2	1055.1	64.4	1055.1	14.8	1055.1	23.2	1055.1	64.4	0.0	(Cc.)
91500	26	74	0.4	0.07	0.00	0.18	0.01	1.88	0.13	0.43	1060.3	113.6	1075.8	30.0	1072.6	46.1	1076.2	62.6	1076.2	15.0	1076.2	23.0	1076.2	62.6	0.0	(Cc.)
91500	26	72	0.4	0.08	0.00	0.18	0.01	1.96	0.13	0.44	1182.0	109.6	1056.8	29.5	1100.5	46.2	1050.7	66.6	1050.7	14.6	1050.7	23.8	1050.7	66.6	0.0	(Cc.)
ST4SH2-66	216	901	0.2	0.08	0.01	0.01	0.00	0.11	0.01	0.51	1208.2	124.7	63.2	2.4	104.9	7.4	60.5	129.0	60.6	1.1	60.6	3.4	60.6	1.1	0.0	(Cc.)
ST4SH2-67	54	547	0.1	0.11	0.00	0.30	0.01	4.75	0.24	0.57	1873.4	44.3	1700.5	43.9	1776.5	43.0	1681.4	43.0	1681.4	21.4	1681.4	22.5	1681.4	43.0	0.0	(Cc.)
ST4SH2-70	104	288	0.4	0.05	0.01	0.01	0.00	0.06	0.01	0.40	241.4	307.0	56.2	3.0	60.5	7.8	55.9	157.8	55.9	1.5	55.9	3.9	55.9	1.5	0.0	(Cc.)
ST4SH2-71	1027	1696	0.6	0.05	0.00	0.01	0.00	0.06	0.00	0.47	65.5	136.5	57.5	1.9	57.5	4.0	57.5	74.6	57.5	1.0	57.5	2.0	57.5	1.0	0.0	(Cc.)
ST4SH2-72	74	203	0.4	0.19	0.02	0.01	0.00	0.26	0.02	0.65	2713.2	147.2	66.0	3.8	238.0	18.6	54.5	312.4	54.5	1.3	54.5	7.1	54.5	1.3	0.0	(Cc.)
ST4SH2-73	170	305	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.39	262.0	299.4	57.9	3.0	62.8	8.0	57.6	156.9	57.6	1.5	57.6	4.0	57.6	1.5	0.0	(Cc.)
ST4SH2-75	572	614	0.9	0.06	0.00	0.03	0.00	0.24	0.02	0.51	583.7	106.1	184.4	6.0	216.0	12.6	182.2	77.5	182.2	2.9	182.2	6.2	182.2	2.9	0.0	(Cc.)
ST4SH2-76	181	367	0.5	0.05	0.01	0.01	0.00	0.06	0.01	0.39	125.4	292.4	55.4	2.7	56.9	7.0	55.4	142.6	55.4	1.3	55.4	3.5	55.4	1.3	0.0	(Cc.)
ST4SH2-77	52	168	0.3	0.08	0.01	0.01	0.00	0.11	0.02	0.45	1155.7	308.5	62.8	4.2	101.8	14.6	60.4	265.0	60.4	2.0	60.4	6.8	60.4	2.0	0.0	(Cc.)
OD3	259	270	1.0	0.06	0.01	0.01	0.00	0.04	0.01	0.39	585.0	374.7	33.4	2.2	42.2	7.0	32.9	235.8	32.9	1.1	32.9	3.4	32.9	1.1	0.0	(Cc.)
GJ1	20	373	0.1	0.06	0.00	0.10	0.00	0.80	0.05	0.53	579.3	86.0	600.0	18.0	594.2	26.6	600.6	53.5	600.6	9.0	600.6	13.3	600.6	9.0	0.0	(Cc.)
NIST	28	77	0.4	0.08	0.00	0.18	0.01	1.83	0.13	0.54	1080.4	110.3	1048.4	36.2	1056.5	45.7	1047.3	59.9	1047.3	18.1	1047.3	22.9	1047.3	59.9	0.0	(Cc.)
NIST	27	74	0.4	0.07	0.00	0.18	0.01	1.85	0.13	0.54	1060.0	109.5	1067.6	36.7	1062.8	45.6	1068.3	58.2	1068.3	18.4	1068.3	22.8	1068.3	58.2	0.0	(Cc.)
NIST	27	72	0.4	0.08	0.00	0.18	0.01	1.93	0.13	0.54	1181.7	105.5	1048.8	36.1	1090.5	45.7	1042.9	61.8	1042.9	17.8	1042.9	23.3	1042.9	61.8	0.0	(Cc.)
91500	26	71	0.4	0.08	0.00	0.18	0.01	1.92	0.13	0.54	1106.2	108.1	1084.3	37.3	1089.2	46.1	1083.5	58.6	1083.5	18.6	1083.5	23.1	1083.5	58.6	0.0	(Cc.)
91500	26	72	0.4	0.08	0.00	0.18	0.01	1.86	0.13	0.54	1090.8	109.7	1058.5	36.5	1066.8	45.9	1057.3	59.7	1057.3	18.2	1057.3	23.0	1057.3	59.7	0.0	(Cc.)
91500	28	74	0.4	0.07	0.00	0.18	0.01	1.82	0.13	0.53	1020.5	111.8	1070.6	36.8	1052.0	45.8	1073.4	57.5	1073.4	18.5	1073.4	22.7	1073.4	57.5	0.0	(Cc.)
ST4SH2-79	211	235	0.9	0.05	0.01	0.01	0.00	0.06	0.01	0.42	186.4	342.1	56.6	3.5	60.5	8.7	56.4	170.9	56.4	1.7	56.4	4.3	56.4	1.7	0.0	(Cc.)
ST4SH2-80	45	94	0.5	0.06	0.01	0.01	0.00	0.08	0.02	0.39	554.1	485.2	58.9	4.9	73.7	15.3	58.0	298.3	58.0	2.4	58.0	7.4	58.0	2.4	0.0	(Cc.)
ST4SH2-81	262	169	1.6	0.07	0.01	0.03	0.00	0.27	0.03	0.54	937.2	175.1	174.7	8.6	242.7	20.2	170.0	133.0	169.9	4.1	169.9	9.7	169.9	4.1	0.0	(Cc.)
ST4SH2-82	212	699	0.3	0.05	0.00	0.01	0.00	0.07	0.01	0.50	314.0	195.3	57.8	2.7	65.2	6.0	57.3	111.0	57.3	1.3	57.3	2.9	57.3	1.3	0.0	(Cc.)

ST4SH2-83	123	293	0.4	0.07	0.01	0.01	0.00	0.08	0.01	0.47	795.0	267.4	56.0	3.3	78.3	9.7	54.6	192.3	54.6	1.6	54.6	4.6	54.6	1.6	0.0	(Cc.)
ST4SH2-84	542	657	0.8	0.06	0.01	0.01	0.00	0.07	0.01	0.50	527.1	197.3	55.5	2.7	68.8	6.5	54.7	126.3	54.7	1.3	54.7	3.1	54.7	1.3	0.0	(Cc.)
ST4SH2-85	136	477	0.3	0.05	0.01	0.01	0.00	0.06	0.01	0.45	258.6	252.5	54.4	2.8	60.0	6.7	54.0	135.4	54.0	1.4	54.0	3.3	54.0	1.4	0.0	(Cc.)
ST4SH2-86	1751	1321	1.3	0.06	0.00	0.01	0.00	0.07	0.01	0.55	494.8	145.8	54.1	2.4	66.2	5.1	53.4	97.4	53.4	1.2	53.4	2.4	53.4	1.2	0.0	(Cc.)
ST4SH2-89	128	339	0.4	0.11	0.01	0.01	0.00	0.15	0.02	0.58	1824.0	187.3	61.2	3.7	140.7	13.8	56.1	245.2	56.1	1.5	56.1	5.8	56.1	1.5	0.0	(Cc.)
ST4SH2-90	930	2084	0.4	0.06	0.00	0.01	0.00	0.06	0.00	0.58	436.4	121.0	53.0	2.2	63.2	4.4	52.4	82.7	52.4	1.1	52.4	2.1	52.4	1.1	0.0	(Cc.)
ST4SH2-91	281	464	0.6	0.05	0.01	0.01	0.00	0.06	0.01	0.45	221.0	256.8	54.9	2.9	59.6	6.7	54.6	134.6	54.6	1.4	54.6	3.3	54.6	1.4	0.0	(Cc.)
OD3	326	336	1.0	0.06	0.01	0.00	0.00	0.04	0.01	0.43	656.3	345.3	31.3	2.1	41.6	6.5	30.7	229.9	30.7	1.0	30.7	3.1	30.7	1.0	0.0	(Cc.)
GJ1	19	360	0.1	0.06	0.00	0.10	0.00	0.81	0.05	0.63	611.5	94.4	590.2	22.9	601.1	29.3	589.2	55.9	589.2	11.4	589.2	14.6	589.2	11.4	0.0	(Cc.)
NIST	26	71	0.4	0.08	0.00	0.18	0.01	1.95	0.14	0.62	1099.2	113.5	1086.0	45.2	1100.0	49.3	1084.0	59.3	1084.0	22.5	1084.0	24.8	1084.0	59.3	0.0	(Cc.)
NIST	27	73	0.4	0.08	0.00	0.18	0.01	1.89	0.14	0.61	1083.8	115.1	1060.2	44.2	1077.4	49.1	1057.8	60.4	1057.8	22.0	1057.8	24.7	1057.8	60.4	0.0	(Cc.)
NIST	28	75	0.4	0.07	0.00	0.18	0.01	1.85	0.14	0.61	1013.4	117.2	1072.3	44.6	1062.5	48.9	1073.8	58.2	1073.8	22.4	1073.8	24.4	1073.8	58.2	0.0	(Cc.)
91500	28	73	0.4	0.07	0.00	0.18	0.01	1.88	0.14	0.61	1058.1	116.2	1065.9	44.5	1072.8	49.1	1065.0	59.6	1065.0	22.2	1065.0	24.6	1065.0	59.6	0.0	(Cc.)
91500	28	73	0.4	0.07	0.00	0.18	0.01	1.83	0.14	0.61	1016.7	116.9	1064.0	44.3	1058.0	48.7	1064.9	58.6	1064.9	22.2	1064.9	24.3	1064.9	58.6	0.0	(Cc.)
91500	28	72	0.4	0.07	0.00	0.17	0.01	1.80	0.13	0.61	1054.1	116.8	1029.6	43.1	1046.8	48.5	1027.3	61.2	1027.3	21.4	1027.3	24.4	1027.3	61.2	0.0	(Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 76
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age})/(^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

B.8 Kiritappu Formation (ST15KR5)

U-Pb LA-ICP-MS Detrital Zircon Data of Kiritappu Formation																													
Sample Location: Station-4, Hamanaka Bay, Eastern Hokkaido, Japan																													
Formation / Group: Kiritappu Formation / Nemuro Group																													
Belt: Nemuro Belt																													
Sample Type: Sandstone																													
Grain Number	Th (PPM)	U (PPM)	Th/U	Isotopic Ratios							U-Pb Age (Ma)								U-Pb Age (Ma)								Preferr ed Age	± 2σ	Disc. (%)
											<i>before Stacey-Kramers Correction</i>								<i>after Stacey-Kramers Correction</i>										
				207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ	Error Corr.	207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ	207Pb/206Pb	± 2σ	206Pb/238U	± 2σ	207Pb/235U	± 2σ							
ST15KR5-1	29	110	0.3	0.06	0.01	0.01	0.00	0.09	0.01	0.40	524.0	121.0	68.4	3.4	82.9	10.4	67.5	160.9	67.5	1.6	67.5	4.7	67.5	1.6	0.0	(Cc.)			
ST15KR5-2	220	369	0.6	0.05	0.00	0.03	0.00	0.22	0.01	0.55	192.7	52.2	198.3	6.0	197.9	11.7	198.3	52.0	198.3	2.9	198.3	4.8	198.3	2.9	0.0	(Cc.)			
ST15KR5-3	141	270	0.5	0.04	0.00	0.01	0.00	0.06	0.01	0.39	0.0	97.9	64.5	2.3	60.3	5.7	64.5	95.1	64.5	1.2	64.5	2.7	64.5	1.2	0.0	(Cc.)			
ST15KR5-4	38	49	0.8	0.05	0.01	0.02	0.00	0.15	0.02	0.44	4.5	149.2	154.0	9.3	145.2	21.3	183.0	134.0	182.5	6.4	182.5	11.3	182.5	6.4	0.0	(Cc.)			
ST15KR5-5	37	143	0.3	0.11	0.00	0.31	0.01	4.56	0.21	0.79	1757.5	25.6	1729.2	70.3	1742.1	190.8	1726.1	26.2	1726.1	26.9	1726.1	18.9	1726.1	26.2	0.0	(Cc.)			
ST15KR5-6	36	104	0.3	0.06	0.00	0.06	0.00	0.46	0.03	0.68	499.8	47.7	363.0	15.1	382.1	27.2	361.5	52.0	361.5	7.1	361.5	9.3	361.5	7.1	0.0	(Cc.)			
ST15KR5-7	144	194	0.7	0.05	0.00	0.02	0.00	0.15	0.01	0.53	298.6	65.2	129.0	4.7	138.2	10.0	128.4	72.3	128.4	2.3	128.4	4.3	128.4	2.3	0.0	(Cc.)			
ST15KR5-8	199	292	0.7	0.10	0.01	0.01	0.00	0.15	0.01	0.63	1689.6	39.8	69.3	2.4	145.7	8.6	64.4	112.6	64.4	1.0	64.4	3.1	64.4	1.0	0.0	(Cc.)			
ST15KR5-9	55	86	0.6	0.05	0.00	0.04	0.00	0.30	0.02	0.59	356.4	67.5	256.0	11.5	266.1	22.4	255.2	71.9	255.2	5.5	255.2	8.6	255.2	5.5	0.0	(Cc.)			
ST15KR5-10	207	410	0.5	0.05	0.00	0.04	0.00	0.31	0.01	0.76	376.3	28.4	262.6	7.9	274.4	12.1	261.7	30.5	261.7	3.8	261.7	4.6	261.7	3.8	0.0	(Cc.)			
ST15KR5-11	24	187	0.1	0.05	0.00	0.02	0.00	0.18	0.01	0.56	269.4	60.6	157.2	5.7	164.4	11.3	156.7	64.9	156.7	2.8	156.7	4.8	156.7	2.8	0.0	(Cc.)			
ST15KR5-12	32	116	0.3	0.05	0.01	0.01	0.00	0.07	0.01	0.40	235.0	126.0	62.9	3.0	67.5	8.3	62.6	139.8	62.6	1.5	62.6	3.8	62.6	1.5	0.0	(Cc.)			
ST15KR5-13	444	458	1.0	0.05	0.00	0.03	0.00	0.21	0.01	0.70	305.2	34.2	180.8	5.4	190.0	8.7	180.2	36.9	180.2	2.6	180.2	3.6	180.2	2.6	0.0	(Cc.)			
ST15KR5-14	111	172	0.6	0.05	0.00	0.03	0.00	0.20	0.01	0.57	238.7	60.0	178.1	6.6	182.4	12.6	177.8	62.3	177.8	3.2	177.8	5.3	177.8	3.2	0.0	(Cc.)			
ST15KR5-15	36	98	0.4	0.05	0.01	0.01	0.00	0.07	0.01	0.40	387.0	132.0	59.6	3.0	68.3	9.0	59.0	161.9	59.0	1.5	59.0	4.2	59.0*	1.5*	0.0	(Cc.)			
ST15KR5-16	135	245	0.6	0.05	0.00	0.03	0.00	0.19	0.01	0.49	287.3	56.0	167.8	4.6	176.0	10.7	167.2	60.3	167.2	2.2	167.2	4.5	167.2	2.2	0.0	(Cc.)			
ST15KR5-17	68	142	0.5	0.06	0.00	0.03	0.00	0.24	0.02	0.51	550.0	60.5	191.1	6.4	220.8	15.8	189.1	75.7	189.1	3.0	189.1	6.3	189.1	3.0	0.0	(Cc.)			
ST15KR5-18	60	143	0.4	0.06	0.00	0.03	0.00	0.25	0.02	0.52	622.0	58.5	192.9	6.4	229.4	16.2	190.4	76.5	190.4	3.0	190.4	6.4	190.4	3.0	0.0	(Cc.)			
ST15KR5-19	53	66	0.8	0.05	0.01	0.03	0.00	0.20	0.02	0.47	315.9	99.2	174.1	8.2	184.2	19.8	173.0	108.0	173.4	4.0	173.4	8.3	173.4	4.0	0.0	(Cc.)			
ST15KR5-20	18	61	0.3	0.10	0.01	0.01	0.00	0.14	0.02	0.48	1578.8	97.2	66.1	3.8	131.8	16.5	61.9	255.6	61.9	1.6	61.9	6.6	61.9	1.6	0.0	(Cc.)			

ST15KR5-21	220	244	0.9	0.06	0.00	0.07	0.00	0.50	0.02	0.61	423.5	37.3	413.5	10.9	415.1	21.4	413.4	37.6	413.4	5.1	413.4	7.2	413.4	5.1	0.0	(Cc.)
ST15KR5-22	54	43	1.3	0.07	0.01	0.04	0.00	0.35	0.03	0.56	793.2	84.7	247.8	13.8	308.0	34.5	243.0	120.0	243.3	6.4	243.3	12.6	243.3	6.4	0.0	(Cc.)
ST15KR5-23	111	221	0.5	0.06	0.00	0.01	0.00	0.09	0.01	0.41	474.0	78.0	75.7	2.4	89.5	7.2	74.8	99.7	74.8	1.2	74.8	3.2	74.8	1.2	0.0	(Cc.)
ST15KR5-24	110	278	0.4	0.05	0.00	0.03	0.00	0.19	0.01	0.49	216.2	53.2	177.6	4.7	180.3	10.4	177.4	54.5	177.4	2.3	177.4	4.3	177.4	2.3	0.0	(Cc.)
ST15KR5-25	479	329	1.5	0.07	0.00	0.02	0.00	0.22	0.01	0.53	995.7	40.8	142.2	3.6	204.0	10.6	138.1	69.9	138.1	1.7	138.1	4.2	138.1	1.7	0.0	(Cc.)
ST15KR5-26	17	36	0.5	0.05	0.01	0.03	0.00	0.21	0.03	0.47	357.0	128.0	178.8	11.0	192.0	26.9	178.0	143.0	177.9	5.3	177.9	11.2	177.9	5.3	0.0	(Cc.)
ST15KR5-27	9	11	0.8	0.11	0.01	0.29	0.03	4.32	0.45	0.90	1743.0	42.4	1658.7	174.4	1696.3	377.4	1649.8	45.2	1649.8	67.6	1649.8	42.8	1649.8	45.2	0.0	(Cc.)
ST15KR5-28	29	76	0.4	0.05	0.01	0.01	0.00	0.07	0.01	0.36	322.0	152.0	62.6	3.3	69.7	10.3	62.2	178.0	62.2	1.6	62.2	4.8	62.2	1.6	0.0	(Cc.)
ST15KR5-29	61	165	0.4	0.06	0.01	0.01	0.00	0.08	0.01	0.38	463.3	98.4	62.7	2.3	74.2	7.4	62.0	126.0	62.0	1.1	62.0	3.4	62.0	1.1	0.0	(Cc.)
ST15KR5-30	95	123	0.8	0.05	0.00	0.03	0.00	0.21	0.02	0.48	127.2	74.8	198.3	7.0	192.9	15.3	198.9	71.6	198.9	3.4	198.9	6.4	198.9	3.4	0.0	(Cc.)
ST15KR5-31	74	176	0.4	0.08	0.01	0.01	0.00	0.10	0.01	0.40	1071.6	77.5	63.1	2.1	98.5	8.7	60.9	146.3	60.9	1.0	60.9	3.8	60.9	1.0	0.0	(Cc.)
ST15KR5-32	45	50	0.9	0.06	0.01	0.03	0.00	0.23	0.02	0.47	534.0	104.0	181.0	9.3	208.6	24.7	179.0	130.0	179.1	4.4	179.1	10.0	179.1	4.4	0.0	(Cc.)
ST15KR5-33	1378	777	1.8	0.05	0.00	0.02	0.00	0.16	0.01	0.34	162.2	46.1	154.1	2.3	154.6	7.0	154.1	46.3	154.1	1.1	154.1	3.0	154.1	1.1	0.0	(Cc.)
ST15KR5-34	24	69	0.3	0.08	0.01	0.01	0.00	0.11	0.01	0.42	1212.0	111.0	63.7	3.4	106.2	13.9	61.0	230.1	61.0	1.5	61.0	5.9	61.0	1.5	0.0	(Cc.)
ST15KR5-35	59	67	0.9	0.07	0.01	0.03	0.00	0.26	0.02	0.49	978.5	80.6	164.2	7.4	230.8	23.3	160.0	135.0	159.6	3.4	159.6	9.1	159.6	3.4	0.0	(Cc.)
ST15KR5-36	781	729	1.1	0.05	0.00	0.02	0.00	0.18	0.01	0.35	326.5	44.4	157.6	2.4	168.6	7.6	156.9	49.2	156.9	1.1	156.9	3.2	156.9	1.1	0.0	(Cc.)
ST15KR5-37	95	144	0.7	0.07	0.00	0.03	0.00	0.23	0.02	0.46	822.3	62.6	161.5	5.0	212.4	15.8	158.1	94.8	158.1	2.4	158.1	6.3	158.1	2.4	0.0	(Cc.)
ST15KR5-38	44	59	0.7	0.06	0.01	0.03	0.00	0.21	0.02	0.45	425.0	104.0	172.1	8.2	190.5	21.6	171.0	121.0	170.9	4.0	170.9	9.0	170.9	4.0	0.0	(Cc.)
ST15KR5-39	155	198	0.8	0.06	0.00	0.06	0.00	0.45	0.02	0.49	554.0	47.3	346.0	8.7	374.4	22.3	343.7	53.9	343.8	4.1	343.8	7.8	343.8	4.1	0.0	(Cc.)
ST15KR5-40	13	64	0.2	0.09	0.01	0.01	0.00	0.13	0.02	0.45	1446.0	103.0	66.1	3.6	123.5	15.8	62.5	248.3	62.5	1.6	62.5	6.5	62.5	1.6	0.0	(Cc.)
ST15KR5-41	0	362	0.0	0.11	0.00	0.30	0.01	4.72	0.16	0.51	1858.8	26.4	1696.2	33.9	1770.3	151.2	1677.7	29.8	1677.7	12.8	1677.7	15.0	1677.7	29.8	0.0	(Cc.)
ST15KR5-42	24	187	0.1	0.05	0.00	0.03	0.00	0.18	0.01	0.41	290.2	68.3	163.6	4.5	172.1	12.2	163.0	73.8	163.0	2.2	163.0	5.2	163.0	2.2	0.0	(Cc.)
ST15KR5-43	22	54	0.4	0.06	0.00	0.04	0.00	0.32	0.03	0.51	524.2	87.0	253.0	12.1	281.4	29.5	251.0	103.0	250.9	5.7	250.9	11.2	250.9	5.7	0.0	(Cc.)
ST15KR5-44	568	658	0.9	0.05	0.00	0.02	0.00	0.17	0.01	0.35	212.4	47.4	153.4	2.4	157.0	7.4	153.1	49.1	153.1	1.2	153.1	3.2	153.1	1.2	0.0	(Cc.)
ST15KR5-45	333	306	1.1	0.05	0.00	0.03	0.00	0.20	0.01	0.40	85.1	57.9	192.5	4.1	184.6	10.7	193.7	54.1	193.7	2.0	193.7	4.5	193.7	2.0	0.0	(Cc.)
ST15KR5-46	51	105	0.5	0.06	0.01	0.01	0.00	0.08	0.01	0.37	418.0	127.0	64.0	2.9	74.3	9.4	63.4	158.2	63.4	1.4	63.4	4.3	63.4	1.4	0.0	(Cc.)
ST15KR5-47	202	222	0.9	0.05	0.00	0.02	0.00	0.18	0.01	0.46	297.2	65.1	157.0	4.7	166.1	11.5	156.4	71.0	156.4	2.3	156.4	4.9	156.4	2.3	0.0	(Cc.)
ST15KR5-48	53	74	0.7	0.06	0.00	0.03	0.00	0.24	0.02	0.49	524.9	86.7	189.5	8.6	216.9	21.7	188.0	107.0	187.7	4.1	187.7	8.7	187.7	4.1	0.0	(Cc.)
ST15KR5-49	62	154	0.4	0.05	0.00	0.01	0.00	0.11	0.01	0.40	297.9	94.3	93.3	3.4	101.5	9.6	92.8	107.0	92.8	1.7	92.8	4.3	92.8	1.7	0.0	(Cc.)
ST15KR5-50	298	622	0.5	0.05	0.00	0.04	0.00	0.29	0.01	0.51	230.9	41.9	261.0	5.7	258.0	12.3	261.3	41.1	261.3	2.7	261.3	4.8	261.3	2.7	0.0	(Cc.)
ST15KR5-51	50	401	0.1	0.09	0.00	0.12	0.00	1.57	0.06	0.60	1508.8	28.6	736.5	17.8	958.1	58.7	710.2	48.1	710.2	7.4	710.2	12.8	710.2	7.4	0.0	(Cc.)

ST15KR5-52	99	188	0.5	0.06	0.00	0.05	0.00	0.35	0.02	0.53	436.8	53.0	285.0	8.7	302.1	19.6	283.7	58.3	283.7	4.1	283.7	7.3	283.7	4.1	0.0	(Cc.)
ST15KR5-53	123	129	1.0	0.06	0.00	0.06	0.00	0.47	0.03	0.57	522.9	53.7	365.7	12.7	388.0	27.7	364.0	59.3	364.0	5.9	364.0	9.5	364.0	5.9	0.0	(Cc.)
ST15KR5-54	216	163	1.3	0.05	0.00	0.03	0.00	0.19	0.01	0.46	305.6	71.2	168.7	5.6	178.2	13.7	168.1	77.4	168.1	2.7	168.1	5.7	168.1	2.7	0.0	(Cc.)
ST15KR5-55	75	123	0.6	0.12	0.00	0.36	0.01	5.82	0.26	0.74	1932.7	26.8	1963.9	74.5	1948.7	232.7	1968.6	26.2	1968.6	27.8	1968.6	19.1	1968.6	26.2	0.0	(Cc.)
ST15KR5-56	75	120	0.6	0.06	0.01	0.01	0.00	0.07	0.01	0.37	463.0	120.0	61.7	2.7	73.1	8.8	61.0	153.1	61.0	1.3	61.0	4.0	61.0	1.3	0.0	(Cc.)
ST15KR5-57	520	303	1.7	0.05	0.00	0.05	0.00	0.37	0.02	0.53	258.3	46.5	331.6	8.6	322.6	18.0	332.4	44.4	332.5	4.1	332.5	6.6	332.5	4.1	0.0	(Cc.)
ST15KR5-58	16	156	0.1	0.05	0.00	0.04	0.00	0.26	0.02	0.50	231.2	65.3	233.3	7.7	233.1	16.9	233.3	65.3	233.3	3.7	233.3	6.8	233.3	3.7	0.0	(Cc.)
ST15KR5-59	48	84	0.6	0.05	0.00	0.03	0.00	0.18	0.02	0.45	226.6	99.7	159.5	7.0	163.8	17.0	159.0	104.0	159.2	3.4	159.2	7.3	159.2	3.4	0.0	(Cc.)
ST15KR5-60	44	132	0.3	0.05	0.01	0.01	0.00	0.07	0.01	0.36	280.0	122.0	62.3	2.6	68.1	8.1	61.9	139.9	61.9	1.3	61.9	3.7	61.9	1.3	0.0	(Cc.)
ST15KR5-61	233	226	1.0	0.05	0.00	0.02	0.00	0.12	0.01	0.44	42.7	71.4	123.1	3.7	119.2	8.4	123.8	68.0	123.8	1.8	123.8	3.8	123.8	1.8	0.0	(Cc.)
ST15KR5-62	113	214	0.5	0.12	0.00	0.33	0.01	5.47	0.16	0.88	1943.8	12.5	1851.0	56.3	1895.1	153.5	1838.5	13.4	1838.5	20.9	1838.5	12.8	1838.5	13.4	0.0	(Cc.)
ST15KR5-63	288	311	0.9	0.05	0.00	0.02	0.00	0.16	0.01	0.50	106.1	53.5	155.0	4.1	152.0	8.5	155.3	51.9	155.3	2.0	155.3	3.7	155.3	2.0	0.0	(Cc.)
ST15KR5-64	97	291	0.3	0.12	0.00	0.35	0.01	5.57	0.15	0.87	1901.9	11.9	1919.3	53.3	1910.9	144.0	1921.8	11.7	1921.8	19.9	1921.8	11.8	1921.8	11.7	0.0	(Cc.)
ST15KR5-65	316	795	0.4	0.05	0.00	0.02	0.00	0.10	0.00	0.50	141.2	42.7	96.3	2.0	98.1	4.3	96.2	43.8	96.2	1.0	96.2	2.0	96.2	1.0	0.0	(Cc.)
Standards																										
91500 4-1	40	104	0.38	0.07	0.00	0.18	0.01	1.88	0.10	0.76	1065.2	85.3	1076.1	46.4	1073.0	95.3	1076.5	34.2	1076.5	19.7	1076.5	17.4	1076.5	34.2	0.0	(Cc.)
91500 4-2	39	101	0.38	0.07	0.00	0.18	0.01	1.85	0.10	0.76	1035.2	86.5	1076.0	46.9	1063.1	95.1	1077.8	34.1	1077.8	20.0	1077.8	17.5	1077.8	34.1	0.0	(Cc.)
91500 4-3	39	93	0.42	0.08	0.00	0.18	0.01	1.89	0.10	0.76	1127.1	86.3	1050.7	47.0	1076.3	98.8	1047.2	36.8	1047.2	19.9	1047.2	18.0	1047.2	36.8	0.0	(Cc.)
91500 4-4	36	95	0.38	0.08	0.00	0.18	0.01	1.86	0.10	0.76	1111.9	86.4	1043.0	46.3	1066.0	97.0	1039.8	36.7	1039.8	19.6	1039.8	17.8	1039.8	36.7	0.0	(Cc.)
91500 4-5	36	99	0.36	0.08	0.00	0.18	0.01	1.86	0.10	0.76	1093.1	86.0	1054.5	46.2	1067.6	96.1	1052.7	35.7	1052.7	19.6	1052.7	17.6	1052.7	35.7	0.0	(Cc.)
OD3 4-1	958	673	1.42	0.04	0.00	0.01	0.00	0.03	0.00	0.37	-136.3	207.4	33.4	1.0	31.2	2.6	33.4	85.6	33.4	0.5	33.4	1.3	33.4	0.5	0.0	(Cc.)
OD3 4-2	858	637	1.35	0.05	0.00	0.01	0.00	0.03	0.00	0.37	-39.8	206.1	33.0	1.0	32.1	2.7	33.0	90.5	33.0	0.5	33.0	1.3	33.0	0.5	0.0	(Cc.)
OD3 4-3	843	613	1.37	0.05	0.00	0.01	0.00	0.04	0.00	0.40	310.3	183.8	33.6	1.1	37.8	3.1	33.3	98.8	33.3	0.5	33.3	1.5	33.3	0.5	0.0	(Cc.)
OD3 4-4	898	645	1.39	0.05	0.00	0.01	0.00	0.03	0.00	0.38	34.9	198.3	33.6	1.1	33.6	2.8	33.6	90.6	33.6	0.5	33.6	1.4	33.6	0.5	0.0	(Cc.)
OD3 4-5	825	615	1.34	0.05	0.00	0.01	0.00	0.03	0.00	0.38	-3.8	204.3	33.9	1.1	33.4	2.8	33.9	91.2	33.9	0.6	33.9	1.4	33.9	0.6	0.0	(Cc.)
91500 5-1	36	95	0.38	0.07	0.00	0.18	0.01	1.76	0.08	0.89	995.3	54.7	1046.0	45.8	1030.2	78.3	1048.3	20.7	1048.3	19.6	1048.3	14.9	1048.3	20.7	0.0	(Cc.)
91500 5-2	40	94	0.42	0.08	0.00	0.18	0.01	1.89	0.09	0.90	1079.3	52.5	1074.2	47.2	1076.3	83.2	1073.9	20.3	1073.9	20.0	1073.9	15.0	1073.9	20.3	0.0	(Cc.)
91500 6-1	43	107	0.40	0.08	0.00	0.18	0.01	1.86	0.08	0.82	1090.9	64.2	1052.7	39.3	1065.7	76.5	1051.0	25.0	1051.0	16.7	1051.0	13.9	1051.0	25.0	0.0	(Cc.)
91500 6-2	47	108	0.44	0.08	0.00	0.17	0.01	1.81	0.08	0.81	1078.9	64.5	1031.7	38.2	1047.4	74.4	1029.6	25.4	1029.6	16.2	1029.6	13.7	1029.6	25.4	0.0	(Cc.)
91500 6-3	42	104	0.41	0.07	0.00	0.18	0.01	1.84	0.08	0.82	1029.1	65.3	1073.6	40.5	1059.5	76.6	1075.6	24.2	1075.6	17.3	1075.6	14.1	1075.6	24.2	0.0	(Cc.)
OD3 5-1	906	662	1.37	0.05	0.00	0.01	0.00	0.03	0.00	0.44	133.0	162.9	33.1	1.0	34.5	2.5	33.0	79.8	33.0	0.5	33.0	1.2	33.0	0.5	0.0	(Cc.)

OD3 5-2	814	614	1.33	0.05	0.00	0.01	0.00	0.04	0.00	0.44	224.6	162.0	33.6	1.1	36.4	2.7	33.5	83.8	33.5	0.5	33.5	1.3	33.5	0.5	0.0	(Cc.)
OD3 5-3	798	612	1.30	0.05	0.00	0.01	0.00	0.04	0.00	0.44	138.4	166.5	34.1	1.1	35.6	2.6	34.0	82.0	34.0	0.5	34.0	1.3	34.0	0.5	0.0	(Cc.)
OD3 6-1	919	679	1.35	0.05	0.00	0.01	0.00	0.03	0.00	0.36	42.9	175.2	32.6	0.8	32.7	2.4	32.5	80.8	32.5	0.4	32.5	1.2	32.5	0.4	0.0	(Cc.)
OD3 6-2	800	602	1.33	0.05	0.00	0.01	0.00	0.03	0.00	0.35	-30.9	187.7	33.5	0.9	32.7	2.5	33.5	83.0	33.5	0.5	33.5	1.2	33.5	0.5	0.0	(Cc.)
OD3 6-3	868	663	1.31	0.05	0.00	0.01	0.00	0.03	0.00	0.37	208.3	167.3	32.3	0.8	34.7	2.5	32.1	84.6	32.1	0.4	32.1	1.2	32.1	0.4	0.0	(Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 65
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age})/(^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

B.9 Akkeshi Formation (ST1AK4)

U-Pb LA-ICP-MS Detrital Zircon Data of Akkeshi Formation																													
Sample Location: Station-1, Hamanaka Area, Eastern Hokkaido, Japan																													
Formation / Group: Akkeshi Formation / Nemuro Group																													
Belt: Nemuro Belt																													
Sample Type: Sandstone (medium sandstone)																													
Grain Number	Th (PPM)	U (PPM)	Th /U	Isotopic Ratios							U-Pb Age (Ma)						U-Pb Age (Ma)						Preferr ed Age	± 2σ	Disc. (%)				
				before Stacey-Kramers Correction										after Stacey-Kramers Correction															
				207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	Error Corr.	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ							
ST1AK4-1	59	53	1.1	0.10	0.01	0.03	0.00	0.45	0.05	0.66	1701.0	246.3	196.8	15.6	373.9	38.1	184.0	223.0	183.5	6.8	183.5	17.3	183.5	6.8	0.0	(Cc.)			
ST1AK4-2	486	383	1.3	0.06	0.00	0.03	0.00	0.20	0.01	0.71	489.3	159.9	165.4	8.1	188.4	12.1	163.8	67.0	163.8	4.0	163.8	5.7	163.8	4.0	0.0	(Cc.)			
ST1AK4-4	43	21	2.1	0.09	0.02	0.04	0.00	0.54	0.10	0.57	1386.8	380.0	279.3	28.8	437.1	65.4	267.0	296.0	266.8	13.2	266.8	32.5	266.8	13.2	0.0	(Cc.)			
ST1AK4-6	44	112	0.4	0.06	0.01	0.06	0.00	0.45	0.04	0.65	499.9	193.5	357.7	19.3	377.1	26.9	356.2	78.1	356.2	9.5	356.2	13.3	356.2	9.5	0.0	(Cc.)			
ST1AK4-7	288	463	0.6	0.06	0.01	0.01	0.00	0.12	0.01	0.66	665.1	179.9	86.8	4.5	110.8	8.4	85.3	92.2	85.3	2.2	85.3	3.8	85.3	2.2	0.0	(Cc.)			
ST1AK4-8	72	94	0.8	0.06	0.01	0.03	0.00	0.26	0.03	0.56	744.1	269.7	187.0	12.4	234.5	25.2	184.0	150.0	183.7	6.0	183.7	12.1	183.7	6.0	0.0	(Cc.)			
ST1AK4-12	29	89	0.3	0.10	0.01	0.03	0.00	0.40	0.04	0.69	1637.2	198.7	181.2	12.1	338.3	28.2	170.0	169.0	169.7	5.3	169.7	12.3	169.7	5.3	0.0	(Cc.)			
ST1AK4-13	92	169	0.5	0.06	0.01	0.02	0.00	0.14	0.02	0.51	413.2	305.4	115.6	7.6	130.5	15.8	115.0	149.0	114.6	3.7	114.6	7.7	114.6	3.7	0.0	(Cc.)			
OD3	522	483	1.1	0.07	0.01	0.01	0.00	0.05	0.01	0.55	834.6	266.7	33.6	2.2	47.8	5.6	32.8	170.5	32.8	1.0	32.8	2.5	32.8	1.0	0.0	(Cc.)			
GJ1	21	370	0.1	0.06	0.00	0.10	0.00	0.81	0.04	1.01	590.8	91.7	602.6	25.6	599.8	20.0													
NIST	25	69	0.4	0.08	0.00	0.18	0.01	1.83	0.12	0.85	1070.3	122.1	1049.8	52.0	1056.0	41.4	1049.0	33.6	1049.0	26.0	1049.0	20.7	1049.0	33.6	0.0	(Cc.)			
NIST	25	71	0.4	0.07	0.00	0.18	0.01	1.86	0.12	0.85	1025.1	123.0	1087.3	53.8	1066.3	41.8	1090.5	32.4	1090.5	27.0	1090.5	21.0	1090.5	32.4	0.0	(Cc.)			
NIST	27	74	0.4	0.08	0.00	0.18	0.01	1.87	0.12	0.86	1120.0	119.5	1049.2	51.9	1072.0	41.2	1046.1	33.1	1046.1	25.8	1046.1	20.5	1046.1	33.1	0.0	(Cc.)			
91500	26	73	0.4	0.07	0.00	0.18	0.01	1.89	0.12	0.85	1061.9	122.1	1086.5	53.7	1077.8	41.9	1087.7	32.8	1087.7	26.9	1087.7	21.0	1087.7	32.8	0.0	(Cc.)			
91500	25	72	0.4	0.08	0.00	0.18	0.01	1.89	0.12	0.86	1111.1	121.2	1064.1	52.9	1079.1	41.9	1062.0	33.6	1062.0	26.4	1062.0	20.9	1062.0	33.6	0.0	(Cc.)			
91500	24	67	0.4	0.08	0.00	0.18	0.01	1.86	0.12	0.85	1122.2	122.4	1041.1	52.1	1067.1	42.0	1037.5	35.1	1037.5	25.9	1037.5	20.9	1037.5	35.1	0.0	(Cc.)			
ST1AK4-14	24	27	0.9	0.10	0.02	0.03	0.00	0.36	0.07	0.60	1608.1	401.9	167.4	19.2	312.1	52.4	157.0	369.0	157.0	8.5	157.0	24.3	157.0	8.5	0.0	(Cc.)			
ST1AK4-16	53	81	0.7	0.07	0.01	0.03	0.00	0.31	0.04	0.62	850.5	272.8	212.0	15.7	274.9	29.2	208.0	148.0	207.5	7.5	207.5	13.8	207.5	7.5	0.0	(Cc.)			
ST1AK4-17	2	43	0.1	0.21	0.03	0.03	0.00	0.80	0.08	0.92	2903.8	201.2	175.8	16.3	596.8	46.1	141.0	198.0	140.6	5.2	140.6	12.1	140.6	5.2	0.0	(Cc.)			
ST1AK4-18	81	166	0.5	0.06	0.01	0.02	0.00	0.17	0.02	0.60	598.1	264.7	130.0	8.8	157.8	16.5	128.0	131.0	128.2	4.3	128.2	7.8	128.2	4.3	0.0	(Cc.)			

	STIAK4-19	38	456	0.1	0.11	0.00	0.29	0.01	4.58	0.10	2.21	1867.7	49.2	1645.0	72.0	1745.7	18.7										
	STIAK4-20	293	310	0.9	0.05	0.01	0.01	0.00	0.09	0.01	0.59	345.4	272.1	79.6	5.2	88.9	9.5	79.0	119.3	79.0	2.6	79.0	4.6	79.0	2.6	0.0	(Cc.)
	STIAK4-21	76	85	0.9	0.06	0.01	0.02	0.00	0.17	0.03	0.52	544.6	371.2	138.5	11.2	163.7	24.0	137.0	191.0	136.8	5.5	136.8	11.6	136.8	5.5	0.0	(Cc.)
	STIAK4-22	191	748	0.3	0.06	0.00	0.06	0.00	0.42	0.02	1.40	433.3	91.3	346.9	17.0	358.5	10.8										
	STIAK4-23	55	626	0.1	0.11	0.00	0.29	0.01	4.25	0.09	2.33	1726.2	48.5	1650.4	71.6	1684.4	17.4										
	STIAK4-24	162	232	0.7	0.07	0.01	0.01	0.00	0.10	0.01	0.60	832.3	267.7	72.5	5.1	100.7	11.3	70.8	157.4	70.8	2.4	70.8	5.1	70.8	2.4	0.0	(Cc.)
	STIAK4-25	34	33	1.0	0.05	0.01	0.06	0.00	0.44	0.07	0.53	406.7	378.7	364.2	30.2	370.2	50.0	364.0	157.0	363.7	15.1	363.7	25.0	363.7	15.1	0.0	(Cc.)
	STIAK4-26	21	45	0.5	0.06	0.01	0.06	0.00	0.47	0.06	0.56	447.9	312.6	378.2	27.8	388.3	43.2	377.0	128.0	377.4	13.8	377.4	21.6	377.4	13.8	0.0	(Cc.)
	OD3	792	582	1.4	0.14	0.01	0.01	0.00	0.13	0.01	0.99	2284.2	131.8	40.8	2.6	121.1	7.3	35.7	30.8	35.7	1.0	35.7	1.1	35.7	1.0	0.0	(Cc.)
	GJ1	20	357	0.1	0.06	0.00	0.10	0.00	0.78	0.03	1.31	588.0	94.6	586.9	28.8	587.3	17.5										
	NIST	26	72	0.4	0.07	0.00	0.18	0.01	1.88	0.11	1.00	1063.5	123.8	1079.5	59.1	1074.5	39.6	1080.2	5.2	1080.2	29.6	1080.2	19.9	1080.2	5.2	0.0	(Cc.)
	NIST	26	71	0.4	0.08	0.00	0.18	0.01	1.88	0.11	1.00	1112.6	123.0	1057.3	58.2	1075.8	39.6										
	NIST	24	65	0.4	0.08	0.00	0.17	0.01	1.85	0.11	0.99	1123.7	124.1	1034.4	57.2	1063.8	39.7	1030.4	6.8	1030.4	28.4	1030.4	19.4	1030.4	6.8	0.0	(Cc.)
	91500	27	73	0.4	0.08	0.00	0.17	0.01	1.85	0.11	1.00	1120.8	123.2	1037.7	57.2	1065.1	39.4	1033.9	2.3	1033.9	28.4	1033.9	19.3	1033.9	2.3	0.0	(Cc.)
	91500	25	68	0.4	0.07	0.00	0.18	0.01	1.88	0.11	1.00	1060.7	124.3	1078.2	59.2	1072.7	39.7	1079.0	5.9	1079.0	29.7	1079.0	19.9	1079.0	5.9	0.0	(Cc.)
	91500	26	69	0.4	0.07	0.00	0.18	0.01	1.86	0.11	1.00	1016.3	123.8	1090.9	59.6	1066.6	39.2										
	STIAK4-28	448	382	1.2	0.06	0.01	0.01	0.00	0.09	0.01	0.67	429.1	251.2	77.4	5.4	90.9	9.2	76.5	110.4	76.5	2.7	76.5	4.3	76.5	2.7	0.0	(Cc.)
	STIAK4-29	21	75	0.3	0.12	0.01	0.38	0.02	6.49	0.30	1.39	1980.6	75.1	2081.7	114.7	2044.9	40.9										
	STIAK4-30	71	69	1.0	0.06	0.01	0.04	0.00	0.31	0.04	0.62	724.7	295.1	222.0	17.8	275.4	31.6	218.0	151.0	218.2	8.6	218.2	15.1	218.2	8.6	0.0	(Cc.)
	STIAK4-31	76	119	0.6	0.07	0.01	0.03	0.00	0.30	0.03	0.73	911.0	223.9	197.3	14.3	268.0	23.9	192.0	115.0	192.3	6.8	192.3	10.7	192.3	6.8	0.0	(Cc.)
	STIAK4-33	23	59	0.4	0.09	0.01	0.03	0.00	0.36	0.05	0.67	1412.0	283.8	182.0	16.3	311.0	36.4	173.0	216.0	172.7	7.3	172.7	16.2	172.7	7.3	0.0	(Cc.)
	STIAK4-36	56	71	0.8	0.07	0.01	0.03	0.00	0.32	0.04	0.65	1064.9	278.8	193.3	16.0	281.2	31.6	187.0	173.0	187.0	7.5	187.0	14.5	187.0	7.5	0.0	(Cc.)
	STIAK4-37	30	79	0.4	0.06	0.01	0.05	0.00	0.46	0.05	0.70	626.4	241.7	336.7	24.5	380.9	33.9	333.0	100.0	333.2	12.0	333.2	16.4	333.2	12.0	0.0	(Cc.)
	STIAK4-39	107	118	0.9	0.06	0.01	0.03	0.00	0.21	0.03	0.63	552.9	294.2	160.2	12.5	190.6	21.9	158.0	139.0	158.1	6.1	158.1	10.4	158.1	6.1	0.0	(Cc.)
	OD3	545	446	1.2	0.09	0.01	0.01	0.00	0.07	0.01	0.71	1413.2	237.4	37.0	2.9	70.6	7.6	34.9	182.7	34.9	1.3	34.9	2.9	34.9	1.3	0.0	(Cc.)
	GJ1	20	368	0.1	0.06	0.00	0.09	0.01	0.80	0.04	1.33	637.1	98.0	576.5	32.8	595.8	20.1										
	NIST	27	74	0.4	0.08	0.00	0.17	0.01	1.86	0.12	1.05	1108.9	126.5	1033.4	63.9	1068.1	42.1										
	NIST	25	69	0.4	0.07	0.00	0.18	0.01	1.88	0.12	1.05	1048.7	127.7	1073.7	66.2	1075.7	42.4										
	NIST	26	69	0.4	0.07	0.00	0.18	0.01	1.87	0.12	1.05	1004.2	127.2	1086.3	66.6	1069.6	41.8										
	91500	26	71	0.4	0.07	0.00	0.19	0.01	1.91	0.12	1.05	1030.2	127.0	1094.6	67.2	1083.5	42.3										
	91500	26	74	0.3	0.08	0.00	0.17	0.01	1.84	0.12	1.06	1095.4	125.5	1026.5	63.2	1058.9	41.4										

ST1AK4-65	15	41	0.4	0.08	0.02	0.03	0.00	0.32	0.05	0.55	1294.3	349.9	173.2	16.0	283.4	42.2	165.0	290.0	165.4	7.3	165.4	20.1	165.4	7.3	0.0	(Cc.)
OD3	674	510	1.3	0.06	0.01	0.00	0.00	0.04	0.01	0.51	537.4	287.3	31.6	2.1	40.1	5.1	31.1	169.5	31.1	1.0	31.1	2.4	31.1	1.0	0.0	(Cc.)
GJ1	19	363	0.1	0.06	0.00	0.09	0.00	0.81	0.05	0.78	687.7	93.1	570.9	25.5	603.8	27.1	567.8	43.3	567.8	12.6	567.8	13.3	567.8	12.6	0.0	(Cc.)
NIST	25	68	0.4	0.07	0.00	0.18	0.01	1.93	0.14	0.75	1054.7	117.5	1088.7	54.3	1090.4	48.2	1088.4	47.7	1088.4	27.1	1088.4	24.1	1088.4	47.7	0.0	(Cc.)
NIST	25	72	0.3	0.07	0.00	0.18	0.01	1.80	0.13	0.74	980.6	120.7	1059.7	52.8	1046.9	47.5	1061.5	47.9	1061.5	26.5	1061.5	23.7	1061.5	47.9	0.0	(Cc.)
NIST	26	76	0.3	0.08	0.00	0.18	0.01	1.90	0.14	0.75	1077.9	116.6	1065.1	53.0	1082.3	47.8	1062.7	48.8	1062.7	26.4	1062.7	23.9	1062.7	48.8	0.0	(Cc.)
91500	25	71	0.3	0.07	0.00	0.18	0.01	1.87	0.13	0.75	1050.1	117.5	1063.2	53.0	1071.8	47.6	1062.0	48.4	1062.0	26.4	1062.0	23.8	1062.0	48.4	0.0	(Cc.)
91500	25	71	0.4	0.08	0.00	0.17	0.01	1.87	0.13	0.75	1120.1	117.2	1025.7	51.5	1069.2	47.7	1019.7	51.5	1019.7	25.4	1019.7	23.9	1019.7	51.5	0.0	(Cc.)
91500	26	71	0.4	0.07	0.00	0.18	0.01	1.83	0.13	0.74	979.3	121.4	1075.8	53.8	1057.2	48.0	1078.6	47.6	1078.6	27.1	1078.6	24.0	1078.6	47.6	0.0	(Cc.)
ST1AK4-66	67	78	0.9	0.06	0.01	0.05	0.00	0.42	0.04	0.85	681.3	231.1	299.2	26.0	353.8	31.2	295.0	76.6	295.0	12.6	295.0	14.1	295.0	12.6	0.0	(Cc.)
ST1AK4-67	115	146	0.8	0.11	0.00	0.35	0.03	5.56	0.25	1.74	1845.5	70.1	1930.8	131.1	1909.5	38.9										
ST1AK4-68	62	86	0.7	0.07	0.01	0.05	0.00	0.54	0.05	0.98	983.2	184.2	336.3	28.3	440.5	31.4	327.9	26.6	327.9	13.4	327.9	12.2	327.9	13.4	0.0	(Cc.)
ST1AK4-69	96	125	0.8	0.06	0.01	0.03	0.00	0.22	0.03	0.79	497.8	257.0	176.7	15.5	205.2	20.8	174.7	93.8	174.7	7.6	174.7	9.6	174.7	7.6	0.0	(Cc.)
ST1AK4-70	58	205	0.3	0.12	0.00	0.29	0.02	4.87	0.21	1.79	1925.2	67.2	1656.6	113.9	1797.7	36.6										
ST1AK4-71	629	677	0.9	0.06	0.00	0.01	0.00	0.10	0.01	1.06	437.6	173.5	80.0	6.4	94.9	6.9										
ST1AK4-73	168	238	0.7	0.06	0.00	0.06	0.01	0.51	0.03	1.24	450.8	140.2	399.9	31.0	415.1	21.9										
ST1AK4-74	409	395	1.0	0.05	0.00	0.02	0.00	0.16	0.01	1.04	211.1	183.5	146.6	11.7	153.6	11.1										
ST1AK4-75	1858	374	5.0	0.05	0.00	0.03	0.00	0.19	0.01	1.08	281.0	172.9	162.4	12.9	173.8	11.9										
ST1AK4-77	428	241	1.8	0.05	0.00	0.02	0.00	0.18	0.02	0.92	288.6	213.9	157.0	13.0	169.0	14.2	156.2	46.1	156.2	6.4	156.2	6.7	156.2	6.4	0.0	(Cc.)
ST1AK4-78	169	168	1.0	0.10	0.00	0.24	0.02	3.23	0.15	1.67	1576.4	78.0	1361.0	96.5	1464.8	36.5										
OD3	558	491	1.1	0.07	0.01	0.01	0.00	0.06	0.01	0.79	1013.9	250.6	35.1	3.2	55.6	6.3	33.9	137.0	33.9	1.5	33.9	2.4	33.9	1.5	0.0	(Cc.)
GJ1	19	347	0.1	0.06	0.00	0.09	0.01	0.80	0.04	1.51	610.6	104.8	583.4	43.6	599.1	23.4										
NIST	25	71	0.4	0.07	0.00	0.18	0.01	1.88	0.12	1.27	1033.2	124.8	1071.3	81.7	1073.8	43.3										
NIST	25	70	0.4	0.08	0.00	0.17	0.01	1.87	0.12	1.27	1103.3	124.3	1033.6	79.2	1071.1	43.4										
NIST	26	70	0.4	0.07	0.00	0.18	0.02	1.84	0.12	1.25	962.2	128.7	1084.1	82.8	1059.2	43.8										
91500	26	71	0.4	0.08	0.00	0.17	0.01	1.83	0.12	1.26	1123.7	124.7	1002.4	77.0	1056.0	43.2										
91500	24	68	0.4	0.07	0.00	0.18	0.02	1.86	0.12	1.26	983.0	127.1	1086.1	82.8	1067.3	43.6										
91500	25	68	0.4	0.07	0.00	0.19	0.02	1.93	0.13	1.26	1026.2	126.4	1100.2	84.0	1090.7	44.2										
ST1AK4-79	12	106	0.1	0.08	0.01	0.02	0.00	0.22	0.03	0.75	1262.1	244.2	119.2	11.0	203.5	22.8	114.0	172.0	113.6	5.0	113.6	9.2	113.6	5.0	0.0	(Cc.)
ST1AK4-80	57	126	0.5	0.08	0.01	0.03	0.00	0.29	0.03	0.81	1130.1	211.1	164.7	14.2	256.8	24.6	158.0	123.0	158.3	6.6	158.3	9.9	158.3	6.6	0.0	(Cc.)
ST1AK4-81	24	40	0.6	0.15	0.03	0.02	0.00	0.38	0.07	0.72	2296.9	343.8	115.1	15.0	325.4	50.4	100.0	467.0	100.2	5.7	100.2	19.6	100.2	5.7	0.0	(Cc.)

ST1AK4-82	161	629	0.3	0.05	0.00	0.02	0.00	0.16	0.01	0.98	116.3	158.1	143.5	11.0	147.6	10.9	143.3	20.8	143.3	5.5	143.3	5.3	143.3	5.5	0.0	(Cc.)
ST1AK4-84	500	422	1.2	0.06	0.00	0.02	0.00	0.15	0.01	0.88	542.0	182.1	117.6	9.4	145.8	12.4	115.7	64.2	115.8	4.5	115.8	5.3	115.8	4.5	0.0	(Cc.)
ST1AK4-85	0	62	0.0	0.08	0.01	0.02	0.00	0.25	0.04	0.67	1105.0	330.1	143.0	14.9	223.6	31.8	137.0	227.0	137.5	6.9	137.5	14.0	137.5	6.9	0.0	(Cc.)
ST1AK4-86	28	84	0.3	0.07	0.01	0.03	0.00	0.28	0.04	0.70	914.9	278.4	177.0	16.4	249.3	29.7	172.0	164.0	172.0	7.8	172.0	13.3	172.0	7.8	0.0	(Cc.)
ST1AK4-87	19	98	0.2	0.07	0.01	0.02	0.00	0.23	0.03	0.72	1063.7	271.4	134.7	12.7	207.9	24.9	130.0	174.0	129.8	5.9	129.8	10.6	129.8	5.9	0.0	(Cc.)
ST1AK4-88	17	10	1.7	0.12	0.01	0.32	0.03	5.38	0.60	0.94	1904.8	166.0	1794.1	165.3	1881.7	95.8	1770.0	38.0	1770.0	80.5	1770.0	46.9	1770.0	38.0	0.0	(Cc.)
ST1AK4-89	19	33	0.6	0.07	0.02	0.03	0.00	0.27	0.06	0.57	1001.0	445.9	163.8	19.4	241.4	45.0	158.0	309.0	158.4	9.1	158.4	21.2	158.4	9.1	0.0	(Cc.)
ST1AK4-90	18	84	0.2	0.12	0.01	0.36	0.03	5.92	0.39	1.19	1883.3	79.0	1970.0	132.9	1964.4	57.0										
ST1AK4-91	41	77	0.5	0.06	0.01	0.03	0.00	0.28	0.04	0.68	602.5	293.8	209.1	19.0	254.0	30.6	206.0	144.0	205.9	9.2	205.9	14.4	205.9	9.2	0.0	(Cc.)
OD3	410	331	1.2	0.07	0.01	0.00	0.00	0.05	0.01	0.64	945.4	332.6	30.2	3.0	47.3	7.2	29.2	228.4	29.2	1.4	29.2	3.1	29.2	1.4	0.0	(Cc.)
GJ1	19	351	0.1	0.06	0.00	0.10	0.01	0.82	0.06	1.14	587.8	107.2	591.7	43.0	609.9	30.7										
NIST	26	72	0.4	0.08	0.00	0.17	0.01	1.83	0.14	1.03	1104.1	127.3	993.0	74.7	1055.6	51.7										
NIST	24	69	0.4	0.07	0.00	0.18	0.01	1.86	0.15	1.03	963.0	129.7	1076.0	80.3	1066.8	52.1										
NIST	25	69	0.4	0.07	0.00	0.18	0.01	1.93	0.15	1.03	1006.4	129.0	1090.0	81.4	1090.3	52.8										
91500	27	72	0.4	0.07	0.00	0.18	0.01	1.85	0.15	1.03	921.8	130.1	1091.7	81.2	1063.9	51.9										
91500	27	76	0.4	0.08	0.00	0.18	0.01	1.94	0.15	1.03	1071.7	127.0	1063.6	79.6	1094.2	52.7										
91500	25	71	0.4	0.07	0.00	0.18	0.01	1.80	0.14	1.02	926.9	132.9	1063.4	79.6	1046.9	52.2										
ST1AK4-93	56	107	0.5	0.09	0.01	0.03	0.00	0.34	0.04	0.56	1411.7	244.0	168.2	12.0	299.7	33.6	159.0	240.0	158.8	5.4	158.8	15.9	158.8	5.4	0.0	(Cc.)
ST1AK4-94	174	344	0.5	0.06	0.01	0.01	0.00	0.09	0.01	0.50	532.5	241.3	70.8	4.1	90.5	10.1	69.6	155.7	69.6	2.0	69.6	4.8	<u>69.6*</u>	<u>2.0*</u>	0.0	(Cc.)
ST1AK4-95	148	225	0.7	0.06	0.01	0.02	0.00	0.16	0.02	0.50	527.2	245.6	120.6	7.1	149.9	16.6	119.0	153.0	118.7	3.5	118.7	8.0	118.7	3.5	0.0	(Cc.)
ST1AK4-97	151	107	1.4	0.12	0.01	0.35	0.02	5.88	0.45	0.65	1898.8	93.4	1925.4	82.1	1958.3	66.3	1915.4	54.7	1915.4	40.6	1915.4	33.7	1915.4	54.7	0.0	(Cc.)
ST1AK4-99	202	397	0.5	0.07	0.01	0.02	0.00	0.24	0.02	0.56	923.2	155.3	150.6	7.5	218.4	17.7	146.0	131.0	146.0	3.6	146.0	8.3	146.0	3.6	0.0	(Cc.)
ST1AK4-101	127	912	0.1	0.05	0.00	0.06	0.00	0.49	0.04	0.60	380.7	117.8	391.7	16.9	407.5	25.1	390.4	70.8	390.4	8.4	390.4	12.5	390.4	8.4	0.0	(Cc.)
ST1AK4-102	272	271	1.0	0.06	0.00	0.06	0.00	0.49	0.04	0.56	460.8	156.8	376.6	18.1	406.0	29.3	374.3	89.0	374.3	8.9	374.3	14.6	374.3	8.9	0.0	(Cc.)
OD3	115	138	0.8	0.08	0.02	0.01	0.00	0.06	0.01	0.48	1149.7	462.0	33.5	3.5	58.3	12.5	31.9	408.1	32.0	1.6	32.0	5.6	32.0	1.6	0.0	(Cc.)
GJ1	19	357	0.1	0.06	0.00	0.10	0.00	0.84	0.07	0.59	580.9	124.2	599.4	26.6	619.7	36.3	597.4	71.3	597.4	13.2	597.4	18.2	597.4	13.2	0.0	(Cc.)
NIST	27	73	0.4	0.07	0.00	0.18	0.01	1.89	0.17	0.61	937.2	142.5	1092.5	54.1	1076.6	58.7	1094.8	68.5	1094.8	27.2	1094.8	29.2	1094.8	68.5	0.0	(Cc.)
NIST	27	78	0.3	0.08	0.01	0.18	0.01	1.98	0.17	0.61	1086.8	139.2	1064.3	53.2	1107.0	59.5	1058.3	75.0	1058.3	26.3	1058.3	30.2	1058.3	75.0	0.0	(Cc.)
NIST	25	73	0.3	0.07	0.00	0.18	0.01	1.84	0.16	0.61	942.2	145.0	1064.2	53.3	1059.4	58.8	1064.8	70.8	1064.8	26.7	1064.8	29.3	1064.8	70.8	0.0	(Cc.)
91500	26	74	0.4	0.07	0.00	0.18	0.01	1.89	0.17	0.61	973.6	142.1	1074.2	53.4	1076.3	58.7	1073.9	70.6	1073.9	26.7	1073.9	29.4	1073.9	70.6	0.0	(Cc.)
91500	26	73	0.4	0.07	0.00	0.18	0.01	1.78	0.16	0.61	901.5	146.8	1053.2	52.7	1039.1	58.3	1055.2	70.2	1055.2	26.5	1055.2	29.0	1055.2	70.2	0.0	(Cc.)

91500 26 74 0.3 0.07 0.01 0.17 0.01 1.84 0.16 0.61 1012.6 142.7 1029.6 51.6 1058.6 58.5 1025.7 74.7 1025.7 25.6 1025.7 29.5 1025.7 74.7 0.0 (Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 68
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age})/(^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

B.10 Akkeshi Formation (ST2AK3)

U-Pb LA-ICP-MS Detrital Zircon Data of Akkeshi Formation

Sample Location: Station-2, Hamanaka Area, Eastern Hokkaido, Japan

Formation / Group: Akkeshi Formation / Nemuro Group

Belt: Nemuro Belt

Sample Type: Sandstone (medium sandstone)

Grain Number	Th (PPM)	U (PPM)	Th /U	Isotopic Ratios							U-Pb Age (Ma)										Preferr ed Age	± 2σ	Disc. (%)			
											<i>before Stacey-Kramers Correction</i>					<i>after Stacey-Kramers Correction</i>										
				207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	Error Corr.	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ					207Pb/ 235U	± 2σ
ST2AK3-1	122	177	0.7	0.06	0.01	0.01	0.00	0.11	0.01	0.49	569.1	296.7	82.7	5.6	103.3	13.7	81.4	182.4	81.4	2.7	81.4	6.6	81.4	2.7	0.0	(Cc.)
ST2AK3-2	513	215	2.4	0.05	0.00	0.03	0.00	0.23	0.02	0.54	393.1	203.8	191.3	10.5	210.7	19.6	190.0	112.0	190.0	5.2	190.0	9.6	190.0	5.2	0.0	(Cc.)
ST2AK3-3	34	30	1.2	0.08	0.02	0.02	0.00	0.27	0.06	0.48	1298.9	476.6	145.9	16.2	243.4	50.8	139.0	426.0	139.2	7.4	139.2	24.6	139.2	7.4	0.0	(Cc.)
ST2AK3-4	420	500	0.8	0.06	0.00	0.01	0.00	0.11	0.01	0.54	429.0	199.5	90.3	4.9	105.8	10.2	89.4	119.5	89.4	2.4	89.4	4.9	89.4	2.4	0.0	(Cc.)
ST2AK3-5	63	85	0.7	0.06	0.01	0.02	0.00	0.22	0.03	0.50	763.0	308.7	155.3	11.4	203.0	27.3	152.0	202.0	152.1	5.5	152.0	13.2	152.1	5.5	0.0	(Cc.)
ST2AK3-6	154	232	0.7	0.08	0.01	0.01	0.00	0.14	0.02	0.57	1288.8	221.6	76.8	5.1	134.0	14.8	73.1	207.9	73.2	2.3	73.2	6.6	73.2	2.3	0.0	(Cc.)
ST2AK3-7	50	61	0.8	0.07	0.01	0.03	0.00	0.26	0.04	0.51	909.1	327.7	170.4	13.6	235.4	33.3	166.0	229.0	165.9	6.4	165.9	16.1	165.9	6.4	0.0	(Cc.)
ST2AK3-9	66	54	1.2	0.06	0.01	0.04	0.00	0.30	0.05	0.48	494.3	338.6	240.3	17.8	269.8	37.0	238.0	180.0	238.2	8.8	238.2	18.4	238.2	8.8	0.0	(Cc.)
ST2AK3-12	33	288	0.1	0.05	0.00	0.06	0.00	0.42	0.04	0.60	357.1	147.9	349.3	17.1	355.7	25.4	348.8	78.5	348.8	8.5	348.8	12.6	348.8	8.5	0.0	(Cc.)
ST2AK3-13	31	40	0.8	0.07	0.01	0.05	0.00	0.50	0.07	0.53	832.4	295.8	334.7	25.1	411.7	49.4	329.0	181.0	328.6	12.1	328.6	24.7	328.6	12.1	0.0	(Cc.)
OD3	740	594	1.2	0.25	0.02	0.01	0.00	0.26	0.02	0.74	3196.7	114.4	46.4	2.8	230.9	17.0	34.1	364.8	34.1	0.8	34.1	5.2	34.1	0.8	0.0	(Cc.)
GJ1	18	352	0.1	0.06	0.00	0.10	0.00	0.83	0.06	0.64	612.6	112.3	603.4	27.7	613.7	34.9	602.4	64.7	602.4	13.8	602.4	17.4	602.4	13.8	0.0	(Cc.)
NIST	26	74	0.4	0.07	0.00	0.18	0.01	1.87	0.16	0.64	1018.1	132.6	1079.1	55.2	1071.1	57.2	1080.3	65.5	1080.3	27.6	1080.3	28.5	1080.3	65.5	0.0	(Cc.)
NIST	26	74	0.4	0.07	0.00	0.18	0.01	1.77	0.15	0.64	946.5	137.4	1058.0	54.5	1034.0	56.8	1061.6	65.3	1061.6	27.4	1061.6	28.2	1061.6	65.3	0.0	(Cc.)
NIST	26	75	0.3	0.07	0.00	0.17	0.01	1.82	0.16	0.64	1056.8	133.5	1034.4	53.3	1053.5	56.9	1031.7	69.3	1031.7	26.5	1031.7	28.6	1031.7	69.3	0.0	(Cc.)
91500	25	72	0.3	0.08	0.01	0.18	0.01	1.89	0.16	0.64	1084.2	133.3	1054.7	54.6	1076.4	57.8	1051.7	69.4	1051.7	27.1	1051.7	29.1	1051.7	69.4	0.0	(Cc.)
91500	24	70	0.3	0.08	0.01	0.18	0.01	1.93	0.17	0.65	1124.6	133.1	1054.8	54.9	1089.9	58.4	1049.9	71.0	1049.9	27.2	1049.9	29.5	1049.9	71.0	0.0	(Cc.)
91500	23	67	0.4	0.07	0.00	0.19	0.01	1.93	0.17	0.64	1045.8	134.7	1097.1	56.8	1092.2	58.5	1097.8	66.4	1097.8	28.4	1097.8	29.2	1097.8	66.4	0.0	(Cc.)
ST2AK3-14	86	222	0.4	0.05	0.00	0.05	0.00	0.36	0.05	0.38	402.4	161.0	298.9	15.2	311.9	37.1	298.0	153.0	297.9	7.5	297.9	18.6	297.9	7.5	0.0	(Cc.)
ST2AK3-16	185	174	1.1	0.06	0.01	0.03	0.00	0.26	0.04	0.39	758.1	197.0	181.9	10.4	231.0	30.7	179.0	208.0	178.5	5.0	178.5	15.3	178.5	5.0	0.0	(Cc.)

ST2AK3-17	11	117	0.1	0.14	0.01	0.05	0.00	1.02	0.14	0.43	2227.6	114.5	330.8	18.4	714.1	68.8	295.0	373.0	295.2	7.3	295.2	42.4	295.2	7.3	0.0	(Cc.)
ST2AK3-18	153	293	0.5	0.07	0.01	0.01	0.00	0.11	0.02	0.40	930.7	227.6	73.7	4.6	107.3	16.1	71.6	254.8	71.6	2.2	71.6	7.7	71.6	2.2	0.0	(Cc.)
ST2AK3-19	71	108	0.7	0.07	0.01	0.03	0.00	0.26	0.04	0.42	1025.2	242.5	162.6	10.9	234.2	34.2	158.0	261.0	157.7	5.1	157.6	17.0	157.7	5.1	0.0	(Cc.)
ST2AK3-20	62	148	0.4	0.07	0.01	0.01	0.00	0.11	0.02	0.41	807.8	328.6	73.7	5.6	101.5	18.2	71.9	286.5	72.0	2.7	72.0	8.8	72.0	2.7	0.0	(Cc.)
ST2AK3-21	38	100	0.4	0.06	0.01	0.03	0.00	0.29	0.05	0.40	638.5	243.4	215.8	13.5	256.4	36.3	213.0	207.0	212.9	6.6	212.9	18.2	212.9	6.6	0.0	(Cc.)
ST2AK3-23	424	413	1.0	0.06	0.01	0.01	0.00	0.09	0.01	0.38	564.9	222.2	74.2	4.3	91.6	13.4	73.1	209.7	73.1	2.1	73.1	6.5	73.1	2.1	0.0	(Cc.)
ST2AK3-24	142	257	0.6	0.06	0.00	0.03	0.00	0.21	0.03	0.38	474.7	190.8	173.7	9.4	196.7	25.9	172.0	179.0	172.2	4.6	172.2	12.9	172.2	4.6	0.0	(Cc.)
ST2AK3-25	67	242	0.3	0.15	0.01	0.26	0.01	5.50	0.69	0.38	2382.8	61.6	1485.8	62.4	1900.3	107.5	1383.0	195.0	1382.7	27.0	1382.7	78.3	1383.0	195.0	0.0	(Cc.)
ST2AK3-26	59	213	0.3	0.06	0.01	0.01	0.00	0.10	0.02	0.39	609.9	291.7	76.4	5.2	96.1	15.9	75.2	241.7	75.2	2.5	75.2	7.8	75.2	2.5	0.0	(Cc.)
OD3	484	412	1.2	0.07	0.01	0.01	0.00	0.05	0.01	0.40	800.5	304.2	32.2	2.3	45.3	8.0	31.4	280.0	31.4	1.1	31.4	3.8	31.4	1.1	0.0	(Cc.)
GJ1	20	372	0.1	0.06	0.00	0.10	0.00	0.82	0.11	0.37	600.9	103.9	608.3	27.7	608.4	58.8	608.0	129.0	608.3	13.8	608.3	29.4	608.3	13.8	0.0	(Cc.)
NIST	25	73	0.3	0.08	0.00	0.18	0.01	1.85	0.25	0.41	1092.4	126.7	1043.8	53.6	1062.0	89.2	1041.0	128.0	1041.3	26.7	1041.3	45.2	1041.0	128.0	0.0	(Cc.)
NIST	25	70	0.4	0.08	0.00	0.18	0.01	1.88	0.26	0.41	1132.8	126.6	1043.9	53.9	1075.5	90.0	1040.0	131.0	1039.5	26.7	1039.5	46.0	1040.0	131.0	0.0	(Cc.)
NIST	24	67	0.4	0.07	0.00	0.18	0.01	1.89	0.26	0.41	1054.0	128.1	1085.8	55.8	1077.7	90.1	1087.0	122.0	1087.0	28.0	1087.0	44.8	1087.0	122.0	0.0	(Cc.)
91500	26	74	0.4	0.08	0.00	0.18	0.01	2.06	0.28	0.41	1214.7	120.2	1090.6	55.6	1135.3	92.0	1084.0	132.0	1084.1	27.5	1084.1	47.5	1084.0	132.0	0.0	(Cc.)
91500	26	75	0.4	0.07	0.00	0.18	0.01	1.82	0.25	0.41	1064.1	127.4	1045.6	53.6	1054.0	88.8	1044.0	126.0	1044.5	26.7	1044.5	44.7	1044.0	126.0	0.0	(Cc.)
91500	27	78	0.3	0.07	0.00	0.18	0.01	1.70	0.23	0.41	877.8	133.3	1068.4	54.4	1009.9	87.0	1078.0	113.0	1078.3	27.7	1078.3	41.9	1078.0	113.0	0.0	(Cc.)
ST2AK3-27	52	171	0.3	0.07	0.01	0.01	0.00	0.14	0.02	0.42	910.0	266.1	93.9	6.6	136.1	21.9	91.2	274.1	91.2	3.1	91.2	10.5	91.2	3.1	0.0	(Cc.)
ST2AK3-28	21	684	0.0	0.05	0.00	0.03	0.00	0.19	0.03	0.38	309.8	150.3	159.2	8.3	172.6	21.9	158.0	163.0	158.3	4.1	158.3	10.9	158.3	4.1	0.0	(Cc.)
ST2AK3-29	63	117	0.5	0.05	0.00	0.06	0.00	0.44	0.07	0.40	407.4	203.1	360.4	21.1	373.6	47.0	359.0	163.0	359.3	10.5	359.3	23.6	359.3	10.5	0.0	(Cc.)
ST2AK3-30	16	41	0.4	0.17	0.03	0.02	0.00	0.37	0.07	0.59	2542.5	308.6	98.9	11.5	317.5	54.2	83.4	689.4	83.5	4.1	83.4	23.6	83.5	4.1	-0.1	(Cc.)
ST2AK3-31	27	51	0.5	0.12	0.02	0.01	0.00	0.25	0.05	0.52	1988.3	338.2	91.3	9.9	223.0	41.6	82.4	549.9	82.5	4.0	82.4	18.8	82.5	4.0	-0.1	(Cc.)
ST2AK3-32	51	40	1.3	0.08	0.01	0.06	0.00	0.68	0.11	0.46	1247.8	244.5	365.9	27.5	524.3	69.6	352.0	268.0	352.5	12.8	352.5	37.0	352.5	12.8	0.0	(Cc.)
ST2AK3-34	20	29	0.7	0.20	0.03	0.04	0.00	1.03	0.18	0.59	2786.3	222.4	237.7	23.1	720.7	87.5	194.0	638.0	193.8	7.7	193.8	49.0	193.8	7.7	0.0	(Cc.)
ST2AK3-35	7	219	0.0	0.06	0.01	0.02	0.00	0.22	0.03	0.40	679.9	210.8	156.7	9.5	198.3	27.7	154.0	213.0	153.9	4.6	153.9	13.7	153.9	4.6	0.0	(Cc.)
ST2AK3-36	111	590	0.2	0.06	0.00	0.02	0.00	0.20	0.03	0.39	651.0	148.0	146.2	7.8	183.7	23.4	144.0	193.0	143.7	3.8	143.7	11.6	143.7	3.8	0.0	(Cc.)
ST2AK3-37	40	54	0.7	0.06	0.01	0.04	0.00	0.36	0.07	0.43	745.9	302.4	252.8	19.5	313.4	49.1	248.0	242.0	248.3	9.4	248.3	24.7	248.3	9.4	0.0	(Cc.)
ST2AK3-39	179	331	0.5	0.06	0.00	0.07	0.00	0.51	0.07	0.39	450.1	133.8	406.1	20.7	420.3	46.7	405.0	146.0	405.0	10.3	405.0	23.5	405.0	10.3	0.0	(Cc.)

OD3	550	470	1.2	0.13	0.01	0.01	0.00	0.12	0.02	0.45	2085.2	163.8	42.6	2.8	115.6	16.1	38.0	445.0	38.0	1.1	38.0	7.0	38.0	1.1	0.0	(Cc.)
GJ1	19	353	0.1	0.06	0.00	0.10	0.01	0.85	0.11	0.39	605.5	115.1	615.8	30.4	623.9	62.1	615.0	135.0	615.0	15.1	615.0	31.2	615.0	15.1	0.0	(Cc.)
NIST	26	73	0.4	0.08	0.01	0.19	0.01	2.09	0.29	0.42	1190.7	129.4	1097.5	59.6	1144.4	95.5	1091.0	136.0	1090.7	29.4	1090.7	49.3	1091.0	136.0	0.0	(Cc.)
NIST	27	74	0.4	0.07	0.01	0.18	0.01	1.85	0.26	0.42	1039.5	136.6	1052.3	57.4	1062.7	92.3	1051.0	130.0	1050.9	28.6	1050.9	46.5	1051.0	130.0	0.0	(Cc.)
NIST	27	77	0.4	0.07	0.00	0.18	0.01	1.73	0.24	0.42	852.6	142.7	1075.2	58.3	1018.5	90.4	1085.0	117.0	1084.9	29.7	1084.9	43.6	1085.0	117.0	0.0	(Cc.)
91500	24	69	0.4	0.07	0.01	0.18	0.01	1.89	0.27	0.43	1046.8	139.1	1071.5	59.0	1078.0	93.5	1071.0	129.0	1070.6	29.5	1070.6	46.9	1071.0	129.0	0.0	(Cc.)
91500	25	72	0.3	0.07	0.01	0.18	0.01	1.83	0.26	0.42	1020.2	139.0	1053.3	57.8	1057.1	92.3	1053.0	129.0	1052.8	28.9	1052.8	46.3	1053.0	129.0	0.0	(Cc.)
91500	26	72	0.4	0.07	0.01	0.17	0.01	1.82	0.25	0.42	1061.7	135.7	1028.1	56.1	1053.4	91.7	1025.0	134.0	1024.7	27.8	1024.7	46.6	1025.0	134.0	0.0	(Cc.)
ST2AK3-40	65	33	2.0	0.12	0.01	0.33	0.02	5.38	0.38	0.85	1901.0	137.7	1831.4	94.5	1882.2	60.0	1817.2	36.4	1817.2	46.5	1817.2	30.1	1817.2	36.4	0.0	(Cc.)
ST2AK3-41	60	63	1.0	0.08	0.01	0.04	0.00	0.44	0.05	0.59	1079.6	262.9	261.9	17.8	370.4	36.5	254.0	164.0	253.6	8.4	253.6	17.7	253.6	8.4	0.0	(Cc.)
ST2AK3-42	119	188	0.6	0.08	0.01	0.01	0.00	0.13	0.02	0.56	1096.9	283.1	75.3	5.3	120.4	14.3	72.5	202.6	72.5	2.4	72.5	6.4	72.5	2.4	0.0	(Cc.)
ST2AK3-43	7	19	0.4	0.12	0.01	0.35	0.02	5.73	0.48	0.83	1923.0	154.4	1914.1	115.1	1936.5	72.2	1907.4	42.8	1907.4	57.1	1907.4	36.2	1907.4	42.8	0.0	(Cc.)
ST2AK3-44	90	199	0.5	0.14	0.01	0.35	0.02	6.80	0.34	0.91	2206.7	109.5	1929.0	76.4	2085.1	44.8	1878.5	23.9	1878.5	36.2	1878.5	22.1	1878.5	23.9	0.0	(Cc.)
ST2AK3-45	67	73	0.9	0.09	0.01	0.02	0.00	0.28	0.04	0.59	1398.7	289.0	140.8	10.9	247.4	29.4	133.0	237.0	133.4	4.9	133.4	13.5	133.4	4.9	0.0	(Cc.)
ST2AK3-46	84	195	0.4	0.06	0.01	0.04	0.00	0.35	0.03	0.64	650.0	203.6	254.3	13.3	302.7	21.7	250.7	89.0	250.7	6.5	250.7	10.4	250.7	6.5	0.0	(Cc.)
ST2AK3-47	128	183	0.7	0.07	0.01	0.03	0.00	0.30	0.03	0.63	970.0	210.5	187.7	10.5	264.2	21.0	182.0	120.0	182.3	5.0	182.3	9.7	182.3	5.0	0.0	(Cc.)
ST2AK3-49	25	627	0.0	0.05	0.00	0.03	0.00	0.21	0.01	0.71	300.1	179.3	178.9	8.3	191.4	11.5	178.1	58.5	178.1	4.1	178.1	5.6	178.1	4.1	0.0	(Cc.)
ST2AK3-50	72	135	0.5	0.09	0.01	0.02	0.00	0.20	0.02	0.60	1412.3	264.7	99.7	7.2	181.9	20.2	94.3	219.8	94.3	3.2	94.3	8.9	94.3	3.2	0.0	(Cc.)
ST2AK3-51	9	13	0.7	0.12	0.01	0.33	0.03	5.73	0.56	0.82	2015.5	173.4	1827.6	128.7	1935.3	84.8	1796.7	58.2	1796.7	62.2	1796.7	42.9	1796.7	58.2	0.0	(Cc.)
ST2AK3-52	28	60	0.5	0.07	0.01	0.03	0.00	0.30	0.04	0.54	1022.7	319.7	186.6	14.3	268.9	33.8	181.0	211.0	180.8	6.7	180.8	16.2	180.8	6.7	0.0	(Cc.)
OD3	390	388	1.0	0.06	0.01	0.01	0.00	0.04	0.01	0.49	624.1	354.8	33.2	2.4	43.8	6.4	32.6	207.2	32.6	1.2	32.6	3.0	32.6	1.2	0.0	(Cc.)
GJ1	19	342	0.1	0.06	0.00	0.10	0.00	0.85	0.05	0.80	644.4	150.9	608.3	26.8	625.7	27.0	606.6	39.0	606.6	13.3	606.6	13.3	606.6	13.3	0.0	(Cc.)
NIST	24	69	0.4	0.07	0.01	0.18	0.01	1.89	0.14	0.75	1044.4	167.3	1073.0	54.4	1077.5	48.9	1072.3	49.5	1072.3	27.2	1072.3	24.5	1072.3	49.5	0.0	(Cc.)
NIST	25	72	0.3	0.07	0.01	0.18	0.01	1.83	0.13	0.75	1017.8	167.5	1054.7	53.2	1056.5	48.1	1054.5	49.2	1054.5	26.6	1054.5	24.1	1054.5	49.2	0.0	(Cc.)
NIST	26	72	0.4	0.07	0.01	0.17	0.01	1.82	0.13	0.75	1059.3	164.4	1029.6	51.6	1052.8	47.2	1026.4	49.8	1026.4	25.6	1026.4	23.6	1026.4	49.8	0.0	(Cc.)
91500	26	74	0.4	0.07	0.01	0.18	0.01	1.84	0.13	0.75	961.5	167.4	1089.4	54.4	1061.4	47.8	1093.7	46.1	1093.7	27.4	1093.7	23.9	1093.7	46.1	0.0	(Cc.)
91500	26	70	0.4	0.08	0.01	0.18	0.01	1.93	0.14	0.75	1085.4	164.1	1075.5	54.1	1092.8	48.4	1073.1	49.0	1073.1	26.9	1073.1	24.2	1073.1	49.0	0.0	(Cc.)
91500	27	76	0.4	0.08	0.01	0.18	0.01	1.89	0.14	0.76	1077.9	163.6	1055.9	52.9	1077.0	47.8	1053.0	49.1	1053.0	26.3	1053.0	23.9	1053.0	49.1	0.0	(Cc.)
ST2AK3-53	45	32	1.4	0.07	0.01	0.06	0.00	0.56	0.08	0.50	928.0	340.7	360.5	26.4	453.8	54.6	353.0	193.0	352.9	12.6	352.9	27.7	352.9	12.6	0.0	(Cc.)

ST2AK3-54	42	79	0.5	0.07	0.01	0.05	0.00	0.48	0.05	0.51	892.4	256.1	313.3	16.5	397.7	35.0	307.0	139.0	306.7	7.9	306.7	17.6	306.7	7.9	0.0	(Cc.)
ST2AK3-55	64	137	0.5	0.09	0.01	0.01	0.00	0.16	0.02	0.53	1447.6	295.7	78.0	5.4	146.4	18.1	73.6	260.8	73.6	2.4	73.6	8.1	73.6	2.4	0.0	(Cc.)
ST2AK3-56	44	51	0.9	0.11	0.01	0.34	0.01	5.19	0.35	0.65	1801.8	152.1	1871.1	70.6	1851.4	56.6	1876.7	44.1	1876.7	35.5	1876.7	28.0	1876.7	44.1	0.0	(Cc.)
ST2AK3-57	121	102	1.2	0.08	0.01	0.03	0.00	0.33	0.04	0.52	1138.5	260.0	191.7	10.8	288.2	27.9	185.0	176.0	184.8	5.0	184.8	13.6	184.8	5.0	0.0	(Cc.)
ST2AK3-58	134	184	0.7	0.11	0.01	0.32	0.01	4.96	0.28	0.60	1836.6	140.1	1767.2	51.5	1812.0	47.2	1755.4	43.5	1755.4	25.4	1755.4	24.2	1755.4	43.5	0.0	(Cc.)
ST2AK3-59	461	254	1.8	0.06	0.01	0.03	0.00	0.20	0.02	0.48	526.5	239.1	160.3	6.8	188.6	15.5	158.0	111.0	158.4	3.3	158.4	7.6	158.4	3.3	0.0	(Cc.)
ST2AK3-60	17	30	0.5	0.15	0.02	0.03	0.00	0.63	0.09	0.66	2311.4	290.9	195.2	18.1	497.7	56.0	171.0	375.0	171.1	7.0	171.1	26.1	171.1	7.0	0.0	(Cc.)
ST2AK3-61	106	124	0.9	0.07	0.01	0.03	0.00	0.27	0.03	0.49	894.9	266.0	175.9	9.4	240.0	23.5	171.0	158.0	171.4	4.5	171.4	11.5	171.4	4.5	0.0	(Cc.)
ST2AK3-62	48	77	0.6	0.34	0.04	0.02	0.00	0.84	0.07	0.86	3648.6	177.9	113.4	8.1	617.6	38.7	71.5	362.3	71.5	1.6	71.5	10.6	71.5*	1.6*	0.0	(Cc.)
ST2AK3-63	96	96	1.0	0.09	0.01	0.05	0.00	0.69	0.06	0.57	1459.0	200.4	337.7	16.0	532.6	35.5	321.0	141.0	321.3	7.2	321.3	18.3	321.3	7.2	0.0	(Cc.)
ST2AK3-65	109	159	0.7	0.06	0.01	0.06	0.00	0.44	0.04	0.49	423.0	231.0	358.6	14.7	372.0	26.6	357.5	87.4	357.5	7.3	357.5	13.3	357.5	7.3	0.0	(Cc.)
OD3	343	321	1.1	0.08	0.01	0.01	0.00	0.06	0.01	0.48	1145.1	327.0	32.6	2.2	54.7	7.6	31.3	253.7	31.3	1.0	31.3	3.4	31.3	1.0	0.0	(Cc.)
GJ1	19	362	0.1	0.06	0.00	0.10	0.00	0.83	0.05	0.54	566.1	179.1	620.1	19.4	615.6	28.2	620.6	55.0	620.6	9.7	620.6	14.1	620.6	9.7	0.0	(Cc.)
NIST	26	74	0.3	0.07	0.01	0.18	0.01	1.81	0.14	0.58	954.8	189.3	1079.4	43.3	1048.8	49.2	1084.2	58.6	1084.2	21.9	1084.2	24.3	1084.2	58.6	0.0	(Cc.)
NIST	26	70	0.4	0.08	0.01	0.18	0.01	1.90	0.14	0.59	1078.8	185.6	1065.7	43.3	1080.0	50.0	1063.6	62.6	1063.6	21.6	1063.6	25.1	1063.6	62.6	0.0	(Cc.)
NIST	27	76	0.4	0.08	0.01	0.18	0.01	1.85	0.14	0.58	1071.2	185.2	1046.2	42.2	1064.3	49.3	1043.7	62.9	1043.7	21.0	1043.7	24.8	1043.7	62.9	0.0	(Cc.)
91500	25	71	0.4	0.08	0.01	0.18	0.01	1.94	0.14	0.59	1125.5	183.2	1063.9	43.0	1094.4	49.9	1059.6	63.5	1059.6	21.3	1059.6	25.2	1059.6	63.5	0.0	(Cc.)
91500	27	77	0.4	0.08	0.01	0.18	0.01	1.88	0.14	0.59	1098.8	183.7	1047.9	42.1	1074.5	49.2	1044.2	63.3	1044.2	20.9	1044.2	24.9	1044.2	63.3	0.0	(Cc.)
91500	26	72	0.4	0.07	0.01	0.18	0.01	1.83	0.14	0.58	985.3	187.8	1075.1	43.0	1055.8	49.2	1078.0	59.3	1078.0	21.6	1078.0	24.4	1078.0	59.3	0.0	(Cc.)
ST2AK3-66	51	135	0.4	0.07	0.01	0.01	0.00	0.13	0.02	0.46	1051.0	320.5	79.0	5.4	121.4	17.3	76.3	250.5	76.3	2.5	76.3	8.1	76.3	2.5	0.0	(Cc.)
ST2AK3-67	216	433	0.5	0.12	0.01	0.36	0.01	6.11	0.40	0.43	1989.3	100.7	1986.2	48.5	1991.7	57.3	1984.5	53.1	1984.5	24.2	1984.5	28.8	1984.5	53.1	0.0	(Cc.)
ST2AK3-68	41	51	0.8	0.23	0.03	0.03	0.00	0.91	0.09	0.70	3052.7	179.7	181.1	12.9	655.9	49.5	140.0	403.0	140.0	3.9	140.0	22.8	140.0	3.9	0.0	(Cc.)
ST2AK3-69	27	58	0.5	0.07	0.01	0.03	0.00	0.28	0.04	0.46	871.8	327.3	191.7	13.1	254.4	34.2	187.0	216.0	187.3	6.3	187.3	16.9	187.3	6.3	0.0	(Cc.)
ST2AK3-70	84	96	0.9	0.06	0.01	0.05	0.00	0.47	0.05	0.45	694.6	221.3	338.1	15.7	389.0	34.0	334.0	126.0	334.1	7.7	334.1	17.1	334.1	7.7	0.0	(Cc.)
ST2AK3-71	79	103	0.8	0.05	0.01	0.03	0.00	0.19	0.03	0.39	283.7	353.9	166.3	9.7	175.0	24.4	166.0	173.0	165.8	4.8	165.8	12.2	165.8	4.8	0.0	(Cc.)
ST2AK3-72	67	74	0.9	0.05	0.01	0.03	0.00	0.22	0.03	0.42	395.7	355.7	185.5	11.7	202.6	28.4	184.0	180.0	184.4	5.8	184.4	14.1	184.4	5.8	0.0	(Cc.)
ST2AK3-73	37	73	0.5	0.06	0.01	0.02	0.00	0.13	0.03	0.41	510.7	465.4	103.4	8.4	123.0	23.4	102.0	263.0	102.1	4.1	102.1	11.5	102.1	4.1	0.0	(Cc.)
ST2AK3-74	74	118	0.6	0.05	0.01	0.02	0.00	0.12	0.02	0.40	407.8	377.1	101.6	6.6	115.8	17.8	101.0	202.0	100.7	3.3	100.7	8.8	100.7	3.3	0.0	(Cc.)
ST2AK3-75	135	200	0.7	0.11	0.01	0.23	0.01	3.56	0.24	0.46	1794.1	108.9	1358.4	38.5	1541.4	54.3	1322.4	76.1	1322.4	18.2	1322.4	31.2	1322.4	76.1	0.0	(Cc.)
ST2AK3-76	115	131	0.9	0.06	0.01	0.02	0.00	0.20	0.03	0.43	768.0	278.1	144.7	8.0	188.2	22.2	142.0	182.0	141.7	3.9	141.7	10.9	141.7	3.9	0.0	(Cc.)
ST2AK3-77	30	63	0.5	0.07	0.01	0.03	0.00	0.26	0.04	0.47	1056.8	320.4	161.6	11.4	236.4	32.1	156.0	239.0	156.4	5.4	156.4	15.6	156.4	5.4	0.0	(Cc.)

ST2AK3-78	55	55	1.0	0.08	0.01	0.03	0.00	0.31	0.05	0.49	1248.2	314.0	174.7	13.0	276.1	36.8	168.0	259.0	167.5	6.0	167.5	18.0	167.5	6.0	0.0	(Cc.)
OD3	567	495	1.1	0.08	0.01	0.01	0.00	0.06	0.01	0.48	1309.5	244.7	34.5	2.0	61.9	7.2	32.8	231.4	32.8	0.9	32.8	3.2	32.8	0.9	0.0	(Cc.)
GJ1	19	354	0.1	0.06	0.00	0.10	0.00	0.82	0.06	0.43	634.4	140.7	595.7	17.7	605.9	33.1	594.7	72.6	594.7	8.8	594.7	16.6	594.7	8.8	0.0	(Cc.)
NIST	25	70	0.4	0.08	0.01	0.18	0.01	1.93	0.16	0.51	1124.2	154.1	1072.0	42.2	1092.4	56.4	1069.1	75.3	1069.1	21.0	1069.1	28.5	1069.1	75.3	0.0	(Cc.)
NIST	27	77	0.4	0.08	0.01	0.18	0.01	1.88	0.16	0.50	1097.5	154.4	1055.9	41.2	1072.6	55.7	1053.6	75.1	1053.6	20.5	1053.6	28.1	1053.6	75.1	0.0	(Cc.)
NIST	25	71	0.4	0.07	0.01	0.18	0.01	1.82	0.15	0.50	984.0	158.2	1083.3	42.2	1053.8	55.5	1087.8	70.1	1087.8	21.3	1087.8	27.3	1087.8	70.1	0.0	(Cc.)
91500	24	70	0.3	0.07	0.01	0.18	0.01	1.79	0.15	0.50	1023.7	156.6	1048.6	40.8	1043.5	54.9	1049.3	72.9	1049.3	20.4	1049.3	27.4	1049.3	72.9	0.0	(Cc.)
91500	25	74	0.3	0.08	0.01	0.18	0.01	1.94	0.16	0.51	1167.7	152.7	1055.4	41.5	1095.7	56.3	1049.7	77.7	1049.7	20.5	1049.7	28.8	1049.7	77.7	0.0	(Cc.)
91500	27	77	0.4	0.07	0.01	0.18	0.01	1.84	0.16	0.50	1042.7	156.7	1063.0	41.6	1059.4	55.6	1063.5	73.1	1063.5	20.8	1063.5	27.7	1063.5	73.1	0.0	(Cc.)
ST2AK3-79	162	192	0.8	0.06	0.01	0.03	0.00	0.23	0.02	0.66	449.4	209.5	190.3	13.2	211.2	20.3	189.0	105.0	188.9	6.5	188.9	9.8	188.9	6.5	0.0	(Cc.)
ST2AK3-80	136	100	1.4	0.07	0.01	0.04	0.00	0.40	0.04	0.68	974.3	199.2	253.1	18.4	338.4	31.2	247.0	128.0	246.7	8.7	246.7	14.5	246.7	8.7	0.0	(Cc.)
ST2AK3-82	87	56	1.6	0.08	0.01	0.03	0.00	0.29	0.05	0.57	1125.5	325.4	175.5	16.1	261.6	37.5	169.0	243.0	169.5	7.5	169.5	17.7	169.5	7.5	0.0	(Cc.)
ST2AK3-83	1586	1032	1.5	0.12	0.00	0.36	0.02	6.01	0.39	0.93	1970.1	51.0	1983.6	103.3	1977.6	56.6	1985.5	21.0	1985.5	51.7	1985.5	28.3	1985.5	21.0	0.0	(Cc.)
ST2AK3-85	69	123	0.6	0.09	0.01	0.02	0.00	0.21	0.03	0.66	1453.1	233.8	107.2	8.8	194.7	22.3	101.0	212.0	101.4	4.0	101.4	9.5	101.4	4.0	0.0	(Cc.)
ST2AK3-86	111	141	0.8	0.06	0.01	0.03	0.00	0.22	0.03	0.64	666.3	231.8	163.5	12.1	201.0	21.3	161.0	132.0	160.9	5.8	160.9	10.0	160.9	5.8	0.0	(Cc.)
ST2AK3-88	133	276	0.5	0.08	0.01	0.01	0.00	0.15	0.02	0.68	1293.6	198.7	82.8	6.2	141.8	14.5	79.0	168.1	79.0	2.8	79.0	6.0	79.0	2.8	0.0	(Cc.)
ST2AK3-89	283	336	0.8	0.06	0.01	0.02	0.00	0.15	0.02	0.69	635.7	184.9	117.7	8.0	146.2	13.5	116.0	107.0	115.8	3.9	115.8	6.2	115.8	3.9	0.0	(Cc.)
ST2AK3-90	28	29	1.0	0.13	0.02	0.03	0.00	0.55	0.09	0.67	2094.3	302.8	194.2	21.2	443.3	59.1	175.0	371.0	174.9	8.6	174.9	26.8	174.9	8.6	0.0	(Cc.)
ST2AK3-91	125	328	0.4	0.07	0.01	0.02	0.00	0.14	0.01	0.68	817.5	191.9	99.0	6.9	134.6	13.0	96.8	124.0	96.8	3.3	96.8	5.8	96.8	3.3	0.0	(Cc.)
OD3	421	399	1.1	0.05	0.01	0.01	0.00	0.04	0.01	0.53	363.1	347.9	34.3	2.8	39.5	6.0	34.0	183.2	34.0	1.4	34.0	2.9	34.0	1.4	0.0	(Cc.)
GJ1	20	359	0.1	0.06	0.00	0.10	0.01	0.84	0.06	0.86	598.5	96.5	627.0	37.3	621.2	33.8	627.6	39.7	627.6	18.7	627.6	17.0	627.6	18.7	0.0	(Cc.)
NIST	24	70	0.3	0.07	0.00	0.18	0.01	1.82	0.15	0.81	1027.7	122.8	1062.0	67.2	1051.3	55.2	1063.5	48.5	1063.5	33.7	1063.5	27.7	1063.5	48.5	0.0	(Cc.)
NIST	25	74	0.3	0.08	0.00	0.18	0.01	1.97	0.17	0.82	1171.6	119.5	1068.9	67.9	1103.7	56.6	1063.9	51.2	1063.9	33.6	1063.9	28.2	1063.9	51.2	0.0	(Cc.)
NIST	27	77	0.4	0.07	0.00	0.18	0.01	1.86	0.16	0.81	1046.7	123.2	1076.6	68.2	1067.2	55.9	1077.9	48.8	1077.9	34.2	1077.9	28.0	1077.9	48.8	0.0	(Cc.)
91500	26	74	0.4	0.07	0.00	0.18	0.01	1.90	0.16	0.81	1062.3	122.2	1092.0	69.1	1082.6	56.2	1093.3	48.4	1093.3	34.6	1093.3	28.2	1093.3	48.4	0.0	(Cc.)
91500	28	80	0.3	0.07	0.00	0.18	0.01	1.80	0.15	0.81	990.1	123.5	1072.2	67.6	1045.9	55.1	1076.1	47.5	1076.1	34.1	1076.1	27.7	1076.1	47.5	0.0	(Cc.)
91500	24	69	0.3	0.08	0.00	0.17	0.01	1.86	0.16	0.81	1190.7	122.9	1006.4	64.6	1066.7	56.3	998.1	55.5	998.1	31.8	998.1	27.9	998.1	31.8	0.0	(Cc.)
ST2AK3-92	114	313	0.4	0.12	0.00	0.28	0.02	4.51	0.31	1.12	1921.6	71.9	1599.9	109.4	1733.4	57.5										
ST2AK3-93	95	180	0.5	0.08	0.01	0.01	0.00	0.15	0.02	0.74	1233.7	237.6	85.9	7.9	140.9	16.4	82.4	167.2	82.4	3.6	82.4	6.6	82.4	3.6	0.0	(Cc.)
ST2AK3-95	160	155	1.0	0.07	0.01	0.03	0.00	0.27	0.03	0.79	897.2	205.5	183.0	15.6	242.9	23.5	179.0	106.0	178.9	7.4	178.9	10.2	178.9	7.4	0.0	(Cc.)
ST2AK3-97	90	169	0.5	0.05	0.01	0.03	0.00	0.19	0.02	0.73	339.4	250.2	166.3	14.2	176.1	19.2	166.0	102.0	165.6	7.0	165.6	9.3	165.6	7.0	0.0	(Cc.)

	ST2AK3-98	40	54	0.7	0.15	0.01	0.40	0.03	8.11	0.62	1.08	2331.3	81.2	2172.1	151.3	2243.5	68.7										
	ST2AK3-99	44	46	1.0	0.07	0.01	0.04	0.00	0.40	0.06	0.68	1022.1	293.9	253.3	24.8	341.5	42.7	247.0	176.0	246.7	11.8	246.7	19.8	246.7	11.8	0.0	(Cc.)
	ST2AK3-100	86	295	0.3	0.16	0.01	0.44	0.03	9.39	0.64	1.13	2431.8	65.3	2338.6	151.3	2377.0	62.8										
	ST2AK3-101a	58	84	0.7	0.09	0.01	0.02	0.00	0.20	0.03	0.68	1321.1	295.3	108.0	10.9	181.8	25.0	103.0	228.0	103.2	5.0	103.2	10.6	103.2	5.0	0.0	(Cc.)
	ST2AK3-102	158	323	0.5	0.13	0.00	0.32	0.02	5.50	0.38	1.12	2029.4	69.6	1805.8	121.4	1901.0	59.1										
	ST2AK3-103	57	60	1.0	0.10	0.01	0.03	0.00	0.36	0.05	0.74	1682.7	259.7	165.2	16.8	315.7	37.8	154.0	227.0	154.4	7.3	154.4	15.5	154.4	7.3	0.0	(Cc.)
	ST2AK3-104	324	390	0.8	0.06	0.00	0.02	0.00	0.20	0.02	0.89	626.0	163.7	155.7	12.4	186.6	15.5	153.6	60.2	153.7	6.1	153.7	6.8	153.7	6.1	0.0	(Cc.)
	OD3	562	469	1.2	0.09	0.01	0.01	0.00	0.06	0.01	0.75	1344.4	230.1	35.6	3.3	63.9	7.6	33.8	175.4	33.8	1.5	33.8	2.8	33.8	1.5	0.0	(Cc.)
	GJ1	20	368	0.1	0.06	0.00	0.10	0.01	0.82	0.06	1.04	645.7	109.6	607.9	45.2	610.0	34.5										
	NIST	26	73	0.4	0.07	0.00	0.18	0.02	1.88	0.16	0.96	1064.0	131.3	1091.1	83.4	1073.6	57.2	1093.7	22.9	1093.7	41.9	1093.7	28.9	1093.7	22.9	0.0	(Cc.)
	NIST	28	80	0.3	0.07	0.00	0.18	0.01	1.78	0.15	0.96	991.9	132.7	1071.3	81.7	1037.1	56.0	1076.6	22.9	1076.6	41.3	1076.6	28.6	1076.6	22.9	0.0	(Cc.)
	NIST	23	68	0.3	0.08	0.01	0.17	0.01	1.83	0.16	0.96	1192.4	131.7	1005.6	77.8	1057.7	57.2	998.5	27.3	998.5	38.3	998.5	27.7	998.5	38.3	0.0	(Cc.)
	91500	23	68	0.3	0.08	0.01	0.17	0.01	1.94	0.17	0.96	1253.2	129.3	1028.1	79.4	1094.2	58.1	1019.0	25.9	1019.0	39.0	1019.0	27.9	1019.0	25.9	0.0	(Cc.)
	91500	25	70	0.4	0.08	0.01	0.19	0.02	1.94	0.17	0.96	1115.8	131.5	1094.9	84.0	1093.3	58.1	1095.1	24.1	1095.1	42.0	1095.1	29.1	1095.1	24.1	0.0	(Cc.)
	91500	26	70	0.4	0.07	0.00	0.18	0.02	1.84	0.16	0.95	1035.9	134.6	1086.8	83.4	1061.5	57.5	1090.6	25.1	1090.6	42.0	1090.6	29.2	1090.6	25.1	0.0	(Cc.)

Legend:

Notes:

Abbreviations:

B.11 Hamanaka Formation (ST3HM4)

U-Pb LA-ICP-MS Detrital Zircon Data of Hamanaka Formation

Sample Location: Station-3, Hamanaka Area, Eastern Hokkaido, Japan

Formation / Group: Hamanaka Formation / Nemuro Group

Belt: Nemuro Belt

Sample Type: Sandstone (medium sandstone)

Grain Number	Th (PPM)	U (PPM)	Th /U	Isotopic Ratios							U-Pb Age (Ma)										Preferr ed Age	± 2σ	Disc. (%)			
											<i>before Stacey-Kramers Correction</i>					<i>after Stacey-Kramers Correction</i>										
				207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	Error Corr.	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ	207Pb/ 235U	± 2σ	207Pb/ 206Pb	± 2σ	206Pb/ 238U	± 2σ				207Pb/ 235U	± 2σ	
ST3HM4-1	97	139	0.7	0.08	0.01	0.01	0.00	0.13	0.02	0.67	1305.5	317.3	69.2	7.9	122.5	19.8	65.8	276.4	65.8	3.6	65.8	8.2	65.8*	3.6*	0.0	(Cc.)
ST3HM4-2	356	543	0.7	0.06	0.01	0.01	0.00	0.10	0.01	0.76	624.7	225.1	73.7	7.2	94.9	11.7	72.4	130.5	72.4	3.5	72.4	5.1	72.4	3.5	0.0	(Cc.)
ST3HM4-3	95	127	0.7	0.09	0.01	0.01	0.00	0.15	0.03	0.68	1356.9	305.3	79.8	9.0	143.7	22.4	75.7	271.8	75.7	4.1	75.7	9.2	75.7	4.1	0.0	(Cc.)
ST3HM4-4	108	130	0.8	0.11	0.01	0.30	0.03	4.80	0.51	0.88	1862.3	122.2	1691.6	140.6	1784.9	90.1	1668.2	53.1	1668.2	68.4	1668.2	44.8	1668.2	53.1	0.0	(Cc.)
ST3HM4-5	4	46	0.1	0.12	0.01	0.33	0.03	5.41	0.61	0.87	1911.1	134.9	1833.9	158.1	1886.3	97.3	1819.2	54.0	1819.2	77.8	1819.2	48.6	1819.2	54.0	0.0	(Cc.)
ST3HM4-6	12	19	0.6	0.09	0.02	0.04	0.01	0.48	0.11	0.63	1485.3	419.4	232.6	31.8	397.6	72.9	220.0	373.0	220.0	14.2	220.0	34.4	220.0	14.2	0.0	(Cc.)
ST3HM4-7	153	235	0.7	0.06	0.01	0.06	0.01	0.50	0.06	0.82	622.7	184.9	368.4	34.3	411.8	39.8	364.9	87.8	364.9	16.8	364.9	18.8	364.9	16.8	0.0	(Cc.)
ST3HM4-8	214	264	0.8	0.07	0.01	0.01	0.00	0.14	0.02	0.73	864.6	246.6	94.4	9.5	133.6	17.4	91.9	163.3	91.9	4.5	91.9	7.5	91.9	4.5	0.0	(Cc.)
ST3HM4-9	386	332	1.2	0.05	0.01	0.02	0.00	0.16	0.02	0.75	361.8	236.2	134.1	13.0	149.6	18.1	133.0	114.0	133.1	6.4	133.1	8.5	133.1	6.4	0.0	(Cc.)
ST3HM4-10	341	1027	0.3	0.06	0.00	0.01	0.00	0.12	0.01	0.82	525.5	180.6	95.0	8.9	115.7	12.6	93.7	95.3	93.7	4.3	93.7	5.5	93.7	4.3	0.0	(Cc.)
ST3HM4-11	249	235	1.1	0.06	0.01	0.03	0.00	0.26	0.03	0.77	508.1	221.0	203.9	19.6	234.1	26.6	202.0	110.0	201.8	9.6	201.8	12.4	201.8	9.6	0.0	(Cc.)
ST3HM4-12	116	314	0.4	0.12	0.01	0.32	0.03	5.45	0.57	0.89	1952.6	115.5	1807.7	146.7	1892.0	90.1	1784.3	49.6	1784.3	71.4	1784.3	44.8	1784.3	49.6	0.0	(Cc.)
OD3	435	379	1.1	0.05	0.01	0.00	0.00	0.03	0.01	0.53	36.3	506.0	30.5	3.5	31.2	6.7	30.5	225.7	30.5	1.7	30.5	3.3	30.5	1.7	0.0	(Cc.)
GJ1	19	344	0.1	0.06	0.00	0.09	0.01	0.80	0.09	0.85	612.0	160.3	581.6	52.3	596.2	49.8	580.2	64.9	580.2	26.0	580.2	24.6	580.2	26.0	0.0	(Cc.)
NIST	25	68	0.4	0.07	0.01	0.18	0.02	1.82	0.21	0.83	996.8	169.5	1062.2	95.9	1053.2	77.0	1063.5	64.3	1063.5	48.1	1063.5	38.6	1063.5	64.3	0.0	(Cc.)
NIST	27	72	0.4	0.07	0.01	0.19	0.02	1.95	0.23	0.84	1033.3	166.5	1114.1	100.2	1099.6	78.5	1116.3	62.3	1116.3	50.3	1116.3	39.4	1116.3	62.3	0.0	(Cc.)
NIST	28	74	0.4	0.08	0.01	0.17	0.02	1.80	0.21	0.84	1093.1	167.2	1007.3	91.4	1046.9	76.7	1002.0	69.9	1002.0	45.2	1002.0	38.0	1002.0	69.9	0.0	(Cc.)
91500	27	71	0.4	0.08	0.01	0.19	0.02	2.01	0.24	0.84	1099.6	165.7	1108.2	100.0	1117.9	79.4	1106.8	64.9	1106.8	49.9	1106.8	39.6	1106.8	64.9	0.0	(Cc.)
91500	27	74	0.4	0.07	0.01	0.18	0.02	1.87	0.22	0.83	1032.5	168.5	1071.0	96.8	1070.7	77.7	1071.0	65.0	1071.0	48.4	1071.0	38.9	1071.0	65.0	0.0	(Cc.)
91500	28	75	0.4	0.07	0.01	0.17	0.02	1.75	0.21	0.83	1017.0	168.9	1014.6	91.9	1027.4	75.8	1012.9	67.0	1012.9	45.8	1012.9	37.8	1012.9	67.0	0.0	(Cc.)

ST3HM4-14	71	75	0.9	0.07	0.01	0.05	0.00	0.52	0.07	0.60	899.4	237.5	337.4	26.0	426.5	45.9	330.0	159.0	330.3	12.5	330.3	22.5	330.3	12.5	0.0	(Cc.)
ST3HM4-15	57	59	1.0	0.11	0.02	0.03	0.00	0.43	0.07	0.62	1722.0	267.5	183.7	17.1	362.5	46.3	170.0	302.0	170.5	7.4	170.5	21.4	170.5	7.4	0.0	(Cc.)
ST3HM4-16	316	494	0.6	0.05	0.01	0.01	0.00	0.09	0.01	0.57	359.0	250.4	75.5	5.5	86.6	10.6	74.8	143.7	74.8	2.7	74.8	5.1	74.8	2.7	0.0	(Cc.)
ST3HM4-17	191	335	0.6	0.05	0.00	0.03	0.00	0.24	0.03	0.62	341.5	204.9	203.4	14.0	218.8	22.3	202.0	112.0	202.4	6.9	202.3	10.9	202.4	6.9	0.0	(Cc.)
ST3HM4-18	343	524	0.7	0.06	0.01	0.01	0.00	0.09	0.01	0.58	496.7	237.3	74.9	5.5	91.2	10.9	73.9	148.5	73.9	2.7	73.9	5.1	73.9	2.7	0.0	(Cc.)
ST3HM4-19	197	149	1.3	0.05	0.01	0.06	0.00	0.41	0.05	0.60	285.3	230.4	348.1	24.7	346.1	35.6	348.0	109.0	348.3	12.3	348.3	17.8	348.3	12.3	0.0	(Cc.)
ST3HM4-20	768	645	1.2	0.06	0.00	0.04	0.00	0.30	0.03	0.65	413.4	168.0	244.7	16.1	266.2	24.1	243.2	99.0	243.2	8.0	243.2	11.8	243.2	8.0	0.0	(Cc.)
ST3HM4-21	96	170	0.6	0.10	0.01	0.03	0.00	0.35	0.05	0.63	1580.9	217.9	161.1	13.0	303.2	34.1	151.0	241.0	151.0	5.7	151.0	15.4	151.0	5.7	0.0	(Cc.)
ST3HM4-22	113	79	1.4	0.07	0.01	0.07	0.01	0.67	0.08	0.62	856.4	212.7	441.5	32.4	523.4	50.1	434.0	133.0	434.4	15.7	434.4	24.9	434.4	15.7	0.0	(Cc.)
ST3HM4-23	46	93	0.5	0.09	0.01	0.05	0.00	0.57	0.07	0.63	1362.1	209.5	290.9	22.5	455.2	46.1	278.0	192.0	277.7	10.3	277.7	22.3	277.7	10.3	0.0	(Cc.)
ST3HM4-24	44	72	0.6	0.08	0.01	0.04	0.00	0.49	0.07	0.61	1244.6	241.4	270.4	22.0	407.8	46.0	260.0	203.0	259.7	10.2	259.7	22.2	259.7	10.2	0.0	(Cc.)
ST3HM4-25	159	763	0.2	0.12	0.01	0.35	0.02	5.60	0.53	0.69	1884.2	112.0	1911.9	107.8	1916.4	81.9	1910.6	62.5	1910.6	53.8	1910.6	41.0	1910.6	62.5	0.0	(Cc.)
ST3HM4-26	454	538	0.8	0.05	0.01	0.01	0.00	0.08	0.01	0.57	288.1	251.8	72.6	5.3	80.9	9.9	72.1	139.1	72.1	2.6	72.1	4.8	72.1	2.6	0.0	(Cc.)
OD3	686	525	1.3	0.05	0.01	0.01	0.00	0.04	0.01	0.51	279.0	350.9	33.5	2.8	37.9	6.0	33.2	188.0	33.2	1.4	33.2	2.9	33.2	1.4	0.0	(Cc.)
GJ1	19	364	0.1	0.06	0.00	0.09	0.01	0.81	0.08	0.66	678.5	154.2	568.5	36.6	600.3	45.9	565.6	88.7	565.6	18.1	565.6	22.8	565.6	18.1	0.0	(Cc.)
NIST	26	69	0.4	0.08	0.01	0.19	0.01	2.03	0.22	0.67	1102.6	163.6	1115.1	74.9	1124.9	74.3	1113.7	82.2	1113.7	37.4	1113.7	37.2	1113.7	82.2	0.0	(Cc.)
NIST	26	72	0.4	0.07	0.01	0.18	0.01	1.89	0.21	0.67	1035.5	166.4	1077.7	72.4	1077.5	72.7	1077.8	82.0	1077.8	36.2	1077.8	36.4	1077.8	82.0	0.0	(Cc.)
NIST	27	73	0.4	0.07	0.01	0.17	0.01	1.77	0.19	0.66	1020.0	166.7	1021.0	68.6	1034.0	70.9	1019.3	84.5	1019.3	34.2	1019.3	35.6	1019.3	84.5	0.0	(Cc.)
91500	26	72	0.4	0.07	0.01	0.18	0.01	1.84	0.20	0.66	1034.2	167.7	1054.1	71.1	1061.1	72.4	1053.1	83.7	1053.1	35.5	1053.1	36.2	1053.1	83.7	0.0	(Cc.)
91500	27	76	0.4	0.07	0.01	0.18	0.01	1.82	0.20	0.66	995.3	168.3	1061.0	71.3	1053.2	72.0	1062.1	81.6	1062.1	35.7	1062.1	35.9	1062.1	81.6	0.0	(Cc.)
91500	25	68	0.4	0.07	0.01	0.18	0.01	1.86	0.20	0.67	1058.1	167.6	1048.9	70.9	1065.5	72.7	1046.6	85.1	1046.6	35.3	1046.6	36.5	1046.6	85.1	0.0	(Cc.)
ST3HM4-27	104	78	1.3	0.09	0.01	0.06	0.00	0.75	0.08	0.55	1450.0	211.1	370.3	21.6	570.7	47.5	353.0	177.0	352.9	9.8	352.9	24.9	352.9	9.8	0.0	(Cc.)
ST3HM4-29	124	111	1.1	0.08	0.01	0.03	0.00	0.37	0.04	0.52	1309.0	196.6	199.0	10.1	320.9	27.3	190.0	170.0	190.1	4.6	190.1	13.4	190.1	4.6	0.0	(Cc.)
ST3HM4-30	202	128	1.6	0.09	0.01	0.03	0.00	0.38	0.04	0.54	1500.4	179.9	184.1	9.1	326.8	26.0	174.0	176.0	173.8	4.1	173.8	12.6	173.8	4.1	0.0	(Cc.)
ST3HM4-31	97	127	0.8	0.06	0.01	0.03	0.00	0.25	0.03	0.46	759.5	237.0	178.4	9.0	229.3	22.6	175.0	151.0	174.8	4.3	174.8	11.1	174.8	4.3	0.0	(Cc.)
ST3HM4-32	109	135	0.8	0.10	0.01	0.03	0.00	0.43	0.04	0.54	1531.2	172.5	202.7	9.8	359.9	27.3	191.0	170.0	191.1	4.3	191.1	13.4	191.1	4.3	0.0	(Cc.)
ST3HM4-33	128	201	0.6	0.06	0.01	0.04	0.00	0.30	0.03	0.46	630.7	192.6	224.4	9.3	267.3	21.3	221.0	113.0	221.3	4.5	221.3	10.6	221.3	4.5	0.0	(Cc.)
ST3HM4-34	153	167	0.9	0.11	0.01	0.13	0.00	1.91	0.11	0.56	1750.2	92.8	775.1	24.3	1086.2	39.4	735.2	88.0	735.2	10.9	735.2	23.2	735.2	10.9	0.0	(Cc.)
ST3HM4-35	115	237	0.5	0.06	0.01	0.01	0.00	0.11	0.01	0.45	758.8	268.3	77.0	4.2	104.6	12.2	75.3	179.5	75.3	2.0	75.3	5.8	75.3	2.0	0.0	(Cc.)
ST3HM4-37	360	364	1.0	0.06	0.01	0.02	0.00	0.17	0.01	0.46	639.4	185.5	124.1	4.9	155.9	12.6	122.0	117.0	122.0	2.4	122.0	6.1	122.0	2.4	0.0	(Cc.)
ST3HM4-39	79	273	0.3	0.07	0.00	0.03	0.00	0.31	0.02	0.48	778.4	159.7	213.5	7.9	271.7	18.7	209.0	105.0	209.3	3.8	209.3	9.3	209.3	3.8	0.0	(Cc.)

OD3	492	455	1.1	0.06	0.01	0.01	0.00	0.05	0.01	0.43	639.0	292.4	35.0	2.0	46.1	5.9	34.3	187.2	34.3	0.9	34.3	2.8	34.3	0.9	0.0	(Cc.)
GJ1	20	377	0.1	0.06	0.00	0.10	0.00	0.83	0.05	0.49	620.4	109.7	599.7	16.7	610.8	27.1	598.6	57.0	598.6	8.3	598.6	13.6	598.6	8.3	0.0	(Cc.)
NIST	25	70	0.4	0.07	0.00	0.18	0.01	1.86	0.14	0.56	1036.7	133.0	1066.0	40.6	1066.2	48.5	1065.9	61.1	1065.9	20.3	1065.9	24.2	1065.9	61.1	0.0	(Cc.)
NIST	26	74	0.4	0.07	0.00	0.18	0.01	1.84	0.13	0.56	997.9	133.3	1072.9	40.5	1058.2	48.1	1075.1	59.5	1075.1	20.3	1075.1	23.9	1075.1	59.5	0.0	(Cc.)
NIST	24	67	0.4	0.07	0.00	0.18	0.01	1.87	0.14	0.56	1060.7	133.2	1060.8	40.7	1070.5	48.8	1059.4	62.2	1059.4	20.3	1059.4	24.5	1059.4	62.2	0.0	(Cc.)
91500	28	76	0.4	0.08	0.01	0.18	0.01	1.92	0.14	0.57	1156.3	130.2	1041.8	40.0	1089.3	48.9	1035.1	65.6	1035.1	19.7	1035.1	25.0	1035.1	65.6	0.0	(Cc.)
91500	26	72	0.4	0.07	0.00	0.18	0.01	1.81	0.13	0.56	979.6	135.3	1067.5	40.6	1048.7	48.4	1070.3	59.8	1070.3	20.4	1070.3	24.0	1070.3	59.8	0.0	(Cc.)
91500	26	71	0.4	0.08	0.00	0.18	0.01	1.91	0.14	0.57	1086.7	130.9	1069.3	40.7	1084.9	48.6	1067.1	61.9	1067.1	20.3	1067.1	24.5	1067.1	61.9	0.0	(Cc.)
ST3HM4-40	158	145	1.1	0.06	0.01	0.03	0.00	0.23	0.03	0.51	702.1	252.5	163.0	9.9	207.0	22.7	160.0	159.0	160.0	4.8	160.0	11.0	160.0	4.8	0.0	(Cc.)
ST3HM4-41	141	214	0.7	0.06	0.01	0.01	0.00	0.10	0.01	0.47	591.7	305.0	74.8	4.9	94.8	12.7	73.5	188.0	73.6	2.4	73.6	6.1	73.6	2.4	0.0	(Cc.)
ST3HM4-43	6374	1620	3.9	0.30	0.01	0.02	0.00	0.70	0.04	0.71	3481.0	54.0	105.3	4.3	538.5	24.2	70.9	313.7	70.9	1.0	70.9	9.1	70.9	1.0	0.0	(Cc.)
ST3HM4-44	48	120	0.4	0.09	0.01	0.02	0.00	0.19	0.03	0.55	1402.4	273.8	99.0	7.5	179.5	22.8	93.7	259.8	93.7	3.4	93.7	10.3	93.7	3.4	0.0	(Cc.)
ST3HM4-46	284	255	1.1	0.08	0.01	0.01	0.00	0.16	0.02	0.55	1134.9	202.6	91.3	5.3	146.7	14.4	87.7	172.8	87.7	2.4	87.7	6.6	87.7	2.4	0.0	(Cc.)
ST3HM4-47	133	199	0.7	0.07	0.01	0.01	0.00	0.11	0.02	0.49	842.1	290.2	74.9	5.1	106.3	13.9	73.0	205.9	73.0	2.4	73.0	6.5	73.0	2.4	0.0	(Cc.)
ST3HM4-48	657	309	2.1	0.06	0.00	0.02	0.00	0.18	0.02	0.53	431.8	192.3	149.7	7.4	170.9	14.9	148.0	109.0	148.3	3.6	148.3	7.3	148.3	3.6	0.0	(Cc.)
ST3HM4-49	35	28	1.3	0.13	0.01	0.33	0.02	6.25	0.51	0.76	2141.6	101.0	1855.4	98.8	2011.3	70.8	1808.3	58.9	1808.3	46.9	1808.3	37.1	1808.3	58.9	0.0	(Cc.)
ST3HM4-50	76	251	0.3	0.06	0.00	0.03	0.00	0.29	0.02	0.57	770.2	156.3	202.8	9.7	259.7	19.5	199.0	108.0	198.8	4.7	198.8	9.4	198.8	4.7	0.0	(Cc.)
ST3HM4-52	104	310	0.3	0.06	0.00	0.07	0.00	0.55	0.04	0.61	596.1	116.1	407.2	17.1	443.7	25.6	404.2	70.1	404.2	8.5	404.2	12.7	404.2	8.5	0.0	(Cc.)
OD3	490	469	1.0	0.07	0.01	0.01	0.00	0.05	0.01	0.51	953.6	254.2	35.5	2.2	54.3	6.6	34.3	198.1	34.3	1.1	34.3	3.0	34.3	1.1	0.0	(Cc.)
GJ1	20	372	0.1	0.06	0.00	0.09	0.00	0.83	0.06	0.64	695.2	96.7	584.2	23.5	616.4	30.5	581.2	59.4	581.2	11.6	581.2	15.2	581.2	11.6	0.0	(Cc.)
NIST	28	76	0.4	0.08	0.00	0.18	0.01	1.94	0.15	0.65	1139.3	121.8	1051.5	49.7	1093.3	52.7	1045.6	64.4	1045.6	24.6	1045.6	26.6	1045.6	64.4	0.0	(Cc.)
NIST	26	72	0.4	0.07	0.00	0.18	0.01	1.82	0.14	0.64	962.2	126.9	1077.4	50.6	1052.6	52.1	1081.2	58.7	1081.2	25.5	1081.2	25.9	1081.2	58.7	0.0	(Cc.)
NIST	26	71	0.4	0.08	0.00	0.18	0.01	1.92	0.15	0.65	1069.5	122.4	1079.2	50.7	1088.8	52.4	1077.8	60.8	1077.8	25.3	1077.8	26.3	1077.8	60.8	0.0	(Cc.)
91500	25	70	0.4	0.07	0.00	0.18	0.01	1.82	0.15	0.64	958.6	128.5	1081.8	51.2	1054.3	52.5	1086.0	58.9	1086.0	25.8	1086.0	26.1	1086.0	58.9	0.0	(Cc.)
91500	27	75	0.4	0.07	0.00	0.18	0.01	1.83	0.15	0.64	1049.6	128.5	1040.1	49.9	1055.8	52.9	1038.0	63.8	1038.0	24.9	1038.0	26.6	1038.0	63.8	0.0	(Cc.)
91500	27	77	0.3	0.08	0.00	0.18	0.01	1.88	0.15	0.65	1084.4	126.0	1048.1	50.1	1072.7	53.0	1044.7	63.9	1044.7	24.9	1044.7	26.7	1044.7	63.9	0.0	(Cc.)
ST3HM4-53	51	138	0.4	0.07	0.01	0.03	0.00	0.30	0.03	0.65	1034.4	200.6	187.0	11.9	264.7	23.3	182.0	131.0	181.5	5.6	181.5	10.7	181.5	5.6	0.0	(Cc.)
ST3HM4-55	76	151	0.5	0.06	0.01	0.03	0.00	0.30	0.03	0.64	765.2	196.8	210.9	12.8	262.8	22.1	207.0	109.0	207.3	6.2	207.3	10.4	207.3	6.2	0.0	(Cc.)
ST3HM4-56	42	90	0.5	0.07	0.01	0.04	0.00	0.40	0.04	0.62	805.3	222.5	279.6	18.2	342.5	31.1	275.0	122.0	274.8	8.8	274.8	15.0	274.8	8.8	0.0	(Cc.)
ST3HM4-57	262	327	0.8	0.07	0.01	0.01	0.00	0.11	0.01	0.60	800.9	229.1	74.8	4.8	101.7	10.5	73.1	142.3	73.1	2.3	73.1	4.8	73.1	2.3	0.0	(Cc.)
ST3HM4-58	390	180	2.2	0.07	0.01	0.03	0.00	0.27	0.02	0.66	898.3	186.1	180.0	10.8	241.1	19.8	176.0	112.0	175.8	5.2	175.8	9.1	175.8	5.2	0.0	(Cc.)

ST3HM4-59	272	192	1.4	0.07	0.01	0.04	0.00	0.33	0.03	0.69	834.8	167.2	228.3	13.1	290.2	21.3	223.8	92.7	223.8	6.3	223.8	9.9	223.8	6.3	0.0	(Cc.)
ST3HM4-60	111	239	0.5	0.18	0.01	0.49	0.02	11.67	0.58	1.01	2608.9	50.1	2550.2	105.4	2578.4	46.2										
ST3HM4-61	113	139	0.8	0.11	0.00	0.32	0.02	4.68	0.25	0.96	1726.6	67.9	1803.0	82.0	1763.7	45.3	1813.9	12.4	1813.9	41.5	1813.9	22.9	1813.9	12.4	0.0	(Cc.)
ST3HM4-63	184	342	0.5	0.06	0.00	0.04	0.00	0.38	0.03	0.76	634.7	135.6	283.4	14.9	323.6	19.6	280.4	61.6	280.4	7.3	280.4	9.3	280.4	7.3	0.0	(Cc.)
ST3HM4-65	78	133	0.6	0.09	0.01	0.01	0.00	0.16	0.02	0.59	1345.8	285.4	87.0	7.1	151.6	19.7	82.8	241.5	82.9	3.2	82.9	8.7	82.9	3.2	0.0	(Cc.)
OD3	532	500	1.1	0.06	0.01	0.01	0.00	0.05	0.01	0.56	756.0	261.0	36.8	2.5	50.1	5.9	36.0	163.5	36.0	1.2	36.0	2.7	36.0	1.2	0.0	(Cc.)
GJ1	19	359	0.1	0.06	0.00	0.10	0.01	0.79	0.05	0.86	558.6	101.7	605.9	29.6	593.8	26.6	607.1	31.4	607.1	14.8	607.1	13.5	607.1	14.8	0.0	(Cc.)
NIST	25	69	0.4	0.07	0.00	0.19	0.01	1.82	0.14	0.80	971.5	129.5	1099.5	59.8	1054.1	48.7	1107.0	41.8	1107.0	30.3	1107.0	24.5	1107.0	41.8	0.0	(Cc.)
NIST	26	74	0.4	0.07	0.00	0.18	0.01	1.83	0.14	0.80	1062.3	129.5	1057.2	58.1	1055.6	49.2	1057.4	45.5	1057.4	29.1	1057.4	24.6	1057.4	45.5	0.0	(Cc.)
NIST	26	75	0.3	0.08	0.00	0.18	0.01	1.88	0.14	0.80	1097.0	127.1	1065.3	58.4	1072.5	49.1	1064.3	45.1	1064.3	29.1	1064.3	24.5	1064.3	45.1	0.0	(Cc.)
91500	27	75	0.4	0.08	0.00	0.17	0.01	1.92	0.14	0.82	1202.6	121.0	1036.6	56.4	1088.2	48.2	1029.4	45.9	1029.4	27.8	1029.4	23.9	1029.4	45.9	0.0	(Cc.)
91500	27	74	0.4	0.07	0.00	0.18	0.01	1.84	0.13	0.81	1035.9	125.3	1077.6	58.3	1060.6	48.0	1080.1	42.2	1080.1	29.3	1080.1	24.1	1080.1	42.2	0.0	(Cc.)
91500	27	74	0.4	0.08	0.00	0.18	0.01	1.92	0.14	0.82	1188.1	120.6	1041.9	56.5	1086.9	48.0	1035.6	45.1	1035.6	27.9	1035.6	23.9	1035.6	45.1	0.0	(Cc.)
ST3HM4-66	142	273	0.5	0.07	0.01	0.01	0.00	0.12	0.01	0.81	1011.3	212.2	79.9	6.4	118.8	11.1	77.4	104.3	77.4	3.0	77.4	4.4	77.4	3.0	0.0	(Cc.)
ST3HM4-67	177	142	1.2	0.12	0.00	0.18	0.01	2.84	0.13	1.54	1885.1	72.4	1070.0	69.5	1367.1	34.4										
ST3HM4-68	51	84	0.6	0.10	0.01	0.03	0.00	0.39	0.04	0.84	1559.8	205.0	187.3	15.9	333.6	29.0	177.0	123.0	176.6	7.1	176.6	10.8	176.6	7.1	0.0	(Cc.)
ST3HM4-69	412	387	1.1	0.06	0.00	0.04	0.00	0.32	0.02	1.06	671.5	147.3	237.7	17.0	280.1	16.8										
ST3HM4-70	103	141	0.7	0.12	0.01	0.01	0.00	0.23	0.02	0.88	1945.1	201.1	90.7	8.0	210.8	19.3	82.7	141.9	82.7	3.3	82.7	5.7	82.7	3.3	0.0	(Cc.)
ST3HM4-71	90	132	0.7	0.11	0.01	0.01	0.00	0.22	0.02	0.83	1744.7	212.4	95.5	8.4	199.9	19.2	88.6	152.9	88.6	3.6	88.6	6.5	88.6	3.6	0.0	(Cc.)
ST3HM4-72	647	531	1.2	0.05	0.00	0.02	0.00	0.11	0.01	0.88	179.4	199.6	107.1	7.8	109.3	8.7	106.9	48.4	106.9	3.9	106.9	4.3	106.9	3.9	0.0	(Cc.)
ST3HM4-75	290	223	1.3	0.06	0.01	0.03	0.00	0.22	0.02	0.85	650.7	199.4	164.4	12.5	198.8	16.2	162.0	67.4	162.1	6.1	162.1	7.1	162.1	6.1	0.0	(Cc.)
ST3HM4-77	21	46	0.5	0.12	0.03	0.03	0.00	0.56	0.10	0.70	2016.4	365.6	208.6	26.8	449.9	67.6	190.0	379.0	189.8	11.1	189.8	30.0	189.8	11.1	0.0	(Cc.)
ST3HM4-78	80	80	1.0	0.15	0.01	0.42	0.03	8.61	0.43	1.47	2338.3	70.0	2271.3	141.7	2298.0	45.9										
OD3	478	405	1.2	0.15	0.01	0.01	0.00	0.12	0.01	1.01	2368.2	160.4	38.7	3.2	119.5	9.4										
GJ1	19	352	0.1	0.06	0.00	0.10	0.01	0.80	0.04	1.39	600.1	99.9	600.7	40.0	596.2	22.6										
NIST	26	72	0.4	0.08	0.00	0.17	0.01	1.91	0.13	1.15	1199.8	122.4	1036.0	72.5	1083.7	43.9										
NIST	26	71	0.4	0.07	0.00	0.18	0.01	1.83	0.12	1.13	1033.1	126.8	1076.9	75.0	1056.2	43.8										
NIST	26	71	0.4	0.08	0.00	0.18	0.01	1.90	0.13	1.15	1185.4	122.1	1041.3	72.7	1082.4	43.7										
91500	26	71	0.4	0.08	0.00	0.18	0.01	1.87	0.12	1.14	1139.8	124.6	1046.8	73.2	1071.0	44.0										
91500	25	67	0.4	0.07	0.00	0.19	0.01	1.83	0.12	1.12	942.8	130.4	1123.5	78.1	1057.3	44.6										
91500	27	72	0.4	0.08	0.00	0.18	0.01	1.86	0.12	1.14	1115.7	124.3	1053.4	73.5	1067.5	43.8										

ST3HM4-79	442	687	0.6	0.07	0.01	0.01	0.00	0.12	0.01	0.75	844.3	174.0	78.4	5.4	111.1	9.7	76.3	104.3	76.3	2.6	76.3	4.1	76.3	2.6	0.0	(Cc.)
ST3HM4-80	89	102	0.9	0.23	0.02	0.07	0.01	2.20	0.17	0.98	3044.1	109.2	426.3	32.0	1180.8	55.2	333.2	79.9	333.2	9.8	333.2	13.2	333.2	9.8	0.0	(Cc.)
ST3HM4-81	224	277	0.8	0.07	0.01	0.03	0.00	0.23	0.02	0.73	783.7	188.8	161.0	11.4	211.9	18.8	158.0	106.0	157.5	5.4	157.5	8.4	157.5	5.4	0.0	(Cc.)
ST3HM4-83	134	126	1.1	0.12	0.01	0.01	0.00	0.24	0.03	0.76	1984.3	204.9	88.1	7.5	215.0	21.9	79.7	229.4	79.7	3.1	79.7	8.0	79.7	3.1	0.0	(Cc.)
ST3HM4-84	43	29	1.5	0.15	0.02	0.04	0.00	0.78	0.11	0.77	2375.9	256.3	229.4	24.5	584.0	62.8	200.0	326.0	199.5	9.3	199.5	26.8	199.5	9.3	0.0	(Cc.)
ST3HM4-85	88	122	0.7	0.07	0.01	0.06	0.00	0.53	0.05	0.78	866.8	162.2	349.6	24.0	433.3	31.7	342.9	81.9	342.9	11.5	342.9	14.6	342.9	11.5	0.0	(Cc.)
ST3HM4-86	183	313	0.6	0.07	0.01	0.01	0.00	0.11	0.01	0.65	839.0	237.7	71.6	5.5	101.6	11.3	69.7	151.8	69.7	2.6	69.7	5.0	69.7	2.6	0.0	(Cc.)
ST3HM4-87	66	111	0.6	0.07	0.01	0.06	0.00	0.59	0.05	0.77	855.8	170.2	388.2	27.0	470.6	35.0	381.3	84.6	381.3	13.0	381.3	16.4	381.3	13.0	0.0	(Cc.)
ST3HM4-88	38	67	0.6	0.11	0.01	0.02	0.00	0.39	0.05	0.72	1832.6	233.3	158.7	14.2	336.1	36.0	146.0	239.0	145.8	6.0	145.8	14.9	145.8	6.0	0.0	(Cc.)
ST3HM4-90	191	286	0.7	0.07	0.01	0.02	0.00	0.22	0.02	0.77	1003.2	168.1	135.0	9.4	198.5	16.6	131.0	106.0	130.7	4.4	130.7	6.9	130.7	4.4	0.0	(Cc.)
OD3	797	679	1.2	0.05	0.01	0.01	0.00	0.04	0.00	0.60	239.1	277.2	33.7	2.5	37.4	4.5	33.4	131.6	33.4	1.2	33.4	2.2	33.4	1.2	0.0	(Cc.)
GJ1	19	356	0.1	0.06	0.00	0.10	0.01	0.82	0.05	0.95	541.5	98.0	611.2	37.2	605.4	30.5	611.8	21.6	611.8	18.6	611.8	15.4	611.8	18.6	0.0	(Cc.)
NIST	26	70	0.4	0.08	0.00	0.18	0.01	1.91	0.15	0.88	1137.5	123.3	1041.0	67.7	1085.5	53.4	1034.8	41.4	1034.8	33.4	1034.8	26.3	1034.8	41.4	0.0	(Cc.)
NIST	25	67	0.4	0.07	0.00	0.19	0.01	1.87	0.15	0.87	940.5	129.2	1117.4	72.3	1071.7	53.8	1125.0	37.5	1125.0	36.6	1125.0	27.3	1125.0	37.5	0.0	(Cc.)
NIST	26	72	0.4	0.08	0.00	0.18	0.01	1.90	0.15	0.88	1113.4	123.1	1047.6	67.9	1081.9	53.2	1042.8	40.5	1042.8	33.7	1042.8	26.3	1042.8	40.5	0.0	(Cc.)
91500	28	74	0.4	0.08	0.00	0.18	0.01	1.90	0.15	0.88	1093.6	123.5	1057.3	68.6	1082.1	53.2	1053.9	39.8	1053.9	34.1	1053.9	26.4	1053.9	39.8	0.0	(Cc.)
91500	26	73	0.4	0.08	0.00	0.17	0.01	1.84	0.15	0.88	1070.0	124.0	1038.4	67.2	1061.3	52.6	1035.3	40.1	1035.3	33.4	1035.3	26.1	1035.3	40.1	0.0	(Cc.)
91500	27	72	0.4	0.07	0.00	0.18	0.01	1.77	0.14	0.87	909.6	129.0	1076.2	69.4	1035.1	52.4	1082.8	37.8	1082.8	35.1	1082.8	26.6	1082.8	37.8	0.0	(Cc.)
ST3HM4-92	288	224	1.3	0.07	0.01	0.03	0.00	0.26	0.03	0.61	897.5	171.8	172.3	10.5	234.5	21.3	168.0	133.0	168.0	5.0	168.0	10.0	168.0	5.0	0.0	(Cc.)
ST3HM4-93	169	188	0.9	0.08	0.01	0.02	0.00	0.25	0.03	0.59	1108.3	201.9	149.3	10.0	226.0	23.1	144.0	170.0	144.0	4.7	144.0	10.7	144.0	4.7	0.0	(Cc.)
ST3HM4-94	129	114	1.1	0.15	0.01	0.05	0.00	1.11	0.11	0.72	2352.8	150.4	333.2	23.9	759.0	55.0	293.0	239.0	292.7	9.2	292.7	27.8	292.7	9.2	0.0	(Cc.)
ST3HM4-95	95	232	0.4	0.06	0.01	0.03	0.00	0.24	0.03	0.59	728.8	194.1	171.8	10.7	217.7	21.2	169.0	133.0	168.7	5.2	168.7	10.1	168.7	5.2	0.0	(Cc.)
ST3HM4-96	80	64	1.2	0.08	0.01	0.03	0.00	0.29	0.05	0.54	1126.0	316.3	170.8	14.7	257.2	36.6	165.0	249.0	164.8	6.8	164.8	17.4	164.8	6.8	0.0	(Cc.)
ST3HM4-97	94	130	0.7	0.08	0.01	0.01	0.00	0.14	0.02	0.55	1310.3	317.4	73.7	6.5	129.2	19.7	70.2	292.5	70.2	3.0	70.2	8.8	70.2	3.0	0.0	(Cc.)
ST3HM4-98	223	432	0.5	0.06	0.00	0.04	0.00	0.33	0.03	0.64	581.9	135.2	254.1	14.1	291.3	22.4	251.4	91.2	251.4	6.9	251.4	10.8	251.4	6.9	0.0	(Cc.)
ST3HM4-99	132	414	0.3	0.12	0.00	0.34	0.02	5.46	0.40	0.72	1905.0	59.0	1868.6	86.0	1893.6	63.0	1861.4	47.4	1861.4	42.7	1861.4	31.8	1861.4	47.4	0.0	(Cc.)
ST3HM4-101	371	262	1.4	0.06	0.00	0.05	0.00	0.37	0.03	0.62	536.7	152.8	287.8	16.4	319.4	25.6	285.5	94.2	285.5	8.1	285.5	12.5	285.5	8.1	0.0	(Cc.)
ST3HM4-102	350	288	1.2	0.06	0.00	0.05	0.00	0.47	0.04	0.65	714.4	132.1	334.3	18.6	389.7	28.6	329.9	91.9	329.9	9.1	329.9	13.9	329.9	9.1	0.0	(Cc.)
ST3HM4-103	15	44	0.3	0.13	0.01	0.36	0.02	6.26	0.54	0.75	2050.1	91.4	1960.3	109.4	2012.2	75.8	1943.9	55.1	1943.9	53.8	1943.9	38.5	1943.9	55.1	0.0	(Cc.)
ST3HM4-104	121	106	1.1	0.07	0.01	0.04	0.00	0.38	0.04	0.60	961.2	201.2	245.9	16.3	330.5	31.9	240.0	147.0	239.6	7.7	239.6	15.3	239.6	7.7	0.0	(Cc.)
OD3	586	521	1.1	0.10	0.01	0.01	0.00	0.08	0.01	0.63	1707.9	183.2	37.4	2.6	82.5	8.7	34.6	231.6	34.6	1.1	34.6	3.5	34.6	1.1	0.0	(Cc.)

GJ1	19	359	0.1	0.06	0.00	0.10	0.01	0.81	0.06	0.68	516.4	102.7	621.3	32.2	603.3	36.3	623.3	60.5	623.3	16.2	623.3	18.2	623.3	16.2	0.0	(Cc.)
NIST	28	76	0.4	0.08	0.00	0.18	0.01	1.94	0.18	0.68	1113.9	125.3	1075.4	61.4	1094.3	60.8	1072.8	68.7	1072.8	30.5	1072.8	30.5	1072.8	68.7	0.0	(Cc.)
NIST	26	74	0.3	0.08	0.00	0.18	0.01	1.88	0.17	0.68	1090.4	125.8	1056.2	60.1	1073.4	60.2	1053.8	68.9	1053.8	29.9	1053.8	30.2	1053.8	68.9	0.0	(Cc.)
NIST	26	74	0.4	0.07	0.00	0.19	0.01	1.80	0.17	0.67	930.5	130.8	1094.6	62.1	1047.0	59.8	1102.5	62.8	1102.5	31.5	1102.5	29.7	1102.5	62.8	0.0	(Cc.)
91500	26	76	0.3	0.07	0.00	0.17	0.01	1.79	0.16	0.68	1066.3	128.0	1019.0	58.3	1040.1	59.4	1016.2	70.3	1016.2	29.0	1016.2	29.8	1016.2	70.3	0.0	(Cc.)
91500	27	77	0.4	0.08	0.00	0.18	0.01	1.95	0.18	0.68	1132.9	124.4	1070.8	61.0	1097.5	60.8	1067.1	69.5	1067.1	30.3	1067.1	30.6	1067.1	69.5	0.0	(Cc.)
91500	27	75	0.4	0.07	0.00	0.18	0.01	1.85	0.17	0.68	1052.6	127.5	1061.9	60.5	1064.8	60.1	1061.5	67.7	1061.5	30.2	1061.5	30.1	1061.5	67.7	0.0	(Cc.)
ST3HM4-106	116	123	0.9	0.08	0.01	0.03	0.00	0.33	0.04	0.60	1100.9	217.9	200.4	13.3	291.6	28.6	194.0	160.0	193.9	6.2	193.9	13.5	193.9	6.2	0.0	(Cc.)
ST3HM4-107	23	162	0.1	0.08	0.01	0.03	0.00	0.27	0.03	0.61	1124.1	207.5	160.4	10.4	241.5	23.2	155.0	158.0	154.8	4.9	154.8	10.7	154.8	4.9	0.0	(Cc.)
ST3HM4-108	92	123	0.7	0.13	0.01	0.02	0.00	0.31	0.04	0.68	2074.9	205.8	111.4	8.5	273.5	27.4	100.0	266.0	100.2	3.5	100.2	11.2	100.2	3.5	0.0	(Cc.)
ST3HM4-109	104	147	0.7	1.73	0.08	0.08	0.00	18.26	1.17	0.90	5994.3	62.3	475.0	26.2	3003.3	61.5	398.0	1005.0	398.2	9.2	398.0	148.0	398.2	9.2	-0.1	(Cc.)
ST3HM4-110	159	118	1.4	0.07	0.00	0.13	0.01	1.20	0.10	0.70	858.6	133.7	775.9	40.9	799.0	44.3	773.4	63.0	773.4	20.3	773.4	22.1	773.4	20.3	0.0	(Cc.)
ST3HM4-112	255	315	0.8	0.08	0.01	0.01	0.00	0.14	0.02	0.60	1200.5	205.2	82.2	5.3	135.0	13.6	78.8	171.7	78.8	2.4	78.8	6.0	78.8	2.4	0.0	(Cc.)
ST3HM4-113	217	324	0.7	0.05	0.01	0.01	0.00	0.09	0.01	0.50	263.9	294.0	80.3	5.2	86.8	10.9	79.9	145.8	79.9	2.6	79.9	5.3	79.9	2.6	0.0	(Cc.)
ST3HM4-114	125	169	0.7	0.07	0.01	0.01	0.00	0.12	0.02	0.52	814.8	311.3	83.5	6.3	114.6	15.9	81.5	207.9	81.5	3.0	81.5	7.5	81.5	3.0	0.0	(Cc.)
ST3HM4-115	42	80	0.5	0.06	0.01	0.07	0.00	0.50	0.06	0.57	423.0	233.6	412.5	25.7	415.0	38.1	412.0	103.0	412.3	12.8	412.3	19.1	412.3	12.8	0.0	(Cc.)
OD3	503	476	1.1	0.08	0.01	0.01	0.00	0.06	0.01	0.56	1100.1	248.6	34.3	2.4	55.4	6.7	33.0	200.7	33.0	1.1	33.0	2.9	33.0	1.1	0.0	(Cc.)
GJ1	20	366	0.1	0.06	0.00	0.10	0.01	0.86	0.06	0.73	687.3	107.8	611.3	29.7	628.9	32.6	609.6	53.3	609.6	14.8	609.6	16.2	609.6	14.8	0.0	(Cc.)
NIST	25	75	0.3	0.07	0.00	0.17	0.01	1.77	0.15	0.71	1054.2	134.0	1025.3	55.6	1036.2	53.6	1023.8	59.9	1023.8	27.7	1023.8	26.9	1023.8	59.9	0.0	(Cc.)
NIST	26	76	0.3	0.08	0.01	0.18	0.01	1.94	0.16	0.72	1120.9	130.4	1077.3	58.2	1093.6	54.8	1075.0	58.9	1075.0	29.0	1075.0	27.5	1075.0	58.9	0.0	(Cc.)
NIST	26	75	0.4	0.07	0.00	0.18	0.01	1.84	0.15	0.71	1040.5	133.6	1068.3	57.7	1060.9	54.3	1069.4	57.6	1069.4	28.9	1069.4	27.1	1069.4	57.6	0.0	(Cc.)
91500	25	73	0.3	0.08	0.01	0.18	0.01	1.86	0.15	0.71	1082.4	134.9	1056.7	57.7	1066.8	55.0	1055.3	60.0	1055.3	28.8	1055.3	27.5	1055.3	60.0	0.0	(Cc.)
91500	25	74	0.3	0.07	0.00	0.19	0.01	1.89	0.16	0.71	1037.4	135.9	1094.4	59.6	1077.2	55.4	1097.0	57.3	1097.0	29.9	1097.0	27.7	1097.0	57.3	0.0	(Cc.)
91500	28	78	0.4	0.08	0.01	0.18	0.01	1.91	0.16	0.71	1132.1	132.4	1056.1	57.5	1082.9	55.1	1052.3	60.8	1052.3	28.6	1052.3	27.6	1052.3	60.8	0.0	(Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 92
- All grains <1.0 Ga, preferred ages are based on ²⁰⁶Pb/²³⁸U, whereas grains >1.0 Ga, preferred ages are based on ²⁰⁷Pb/²⁰⁶Pb
- *) = YSG Age (Youngest Single Grain)

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- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age}) / (^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
 - This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

Appendix C: U-Pb Detrital Zircon Data of the Tokoro Belt

C.1 Kamibaro Unit (ST22KMB5)

U-Pb LA-ICP-MS Detrital Zircon Data of Kamibaro Unit																										
Sample Location: Station-22, Saroma Area, Eastern Hokkaido, Japan																										
Unit / Group: Kamibaro Unit / Yubetsu Group																										
Belt: Tokoro Belt																										
Sample Type: Sandstone																										
Grain Number	Th (PPM)	U (PPM)	Th /U	Isotopic Ratios							U-Pb Age (Ma)					U-Pb Age (Ma)					Preferr ed Age	± 1σ	Disc. (%)			
											<i>before Stacey-Kramers Correction</i>					<i>after Stacey-Kramers Correction</i>										
				207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ	207Pb/ 235U	± 1σ	Error Corr.	207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ	207Pb/ 235U	± 1σ	207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ					207Pb/ 235U	± 1σ
ST22KMB5-1	405	489	0.8	0.05	0.00	0.01	0.00	0.09	0.00	0.74	179.4	36.8	80.4	1.4	83.0	1.9	80.3	39.1	80.3	1.4	80.3	1.9	80.3	1.4	0.0	(Cc.)
ST22KMB5-2	135	135	1.0	0.07	0.00	0.13	0.00	1.24	0.03	0.92	856.0	16.9	806.1	14.3	814.1	11.6	804.6	17.5	804.6	14.2	804.6	11.4	804.6	14.2	0.0	(Cc.)
ST22KMB5-3	847	598	1.4	0.05	0.00	0.01	0.00	0.09	0.00	0.77	163.4	33.5	81.5	1.4	83.5	1.9	81.4	35.2	81.4	1.4	81.4	1.8	81.4	1.4	0.0	(Cc.)
ST22KMB5-4	242	302	0.8	0.05	0.00	0.01	0.00	0.09	0.00	0.68	167.3	45.5	85.4	1.5	87.5	2.3	85.2	47.8	85.3	1.5	85.3	2.2	85.3	1.5	0.0	(Cc.)
ST22KMB5-5	404	470	0.9	0.05	0.00	0.01	0.00	0.07	0.00	0.71	126.7	41.4	69.1	1.2	70.1	1.7	69.0	42.8	69.0	1.2	69.0	1.7	69.0	1.2	0.0	(Cc.)
ST22KMB5-6	552	537	1.0	0.05	0.00	0.01	0.00	0.10	0.00	0.78	195.2	32.8	91.6	1.6	94.7	2.1	91.3	34.9	91.4	1.6	91.4	2.0	91.4	1.6	0.0	(Cc.)
ST22KMB5-7	461	476	1.0	0.06	0.00	0.03	0.00	0.24	0.00	0.87	502.7	21.3	196.1	3.3	219.8	4.0	194.3	25.8	194.4	3.3	194.4	3.6	194.4	3.3	0.0	(Cc.)
ST22KMB5-8	305	412	0.7	0.05	0.00	0.01	0.00	0.10	0.00	0.74	113.1	38.2	93.7	1.6	93.6	2.2	93.6	38.7	93.6	1.7	93.6	2.2	93.6	1.7	0.0	(Cc.)
ST22KMB5-9	374	414	0.9	0.19	0.00	0.01	0.00	0.33	0.01	0.91	2741.1	13.5	81.1	1.4	288.2	5.1	66.6	78.2	66.6	0.9	66.6	2.4	66.6	0.9	0.0	(Cc.)
ST22KMB5-10	378	550	0.7	0.05	0.00	0.01	0.00	0.09	0.00	0.77	106.6	34.4	87.6	1.5	87.5	2.0	87.5	34.8	87.6	1.5	87.6	1.9	87.6	1.5	0.0	(Cc.)
ST22KMB5-11	63	108	0.6	0.07	0.00	0.01	0.00	0.14	0.00	0.63	1057.8	52.6	84.5	1.8	128.1	4.3	81.7	97.1	81.7	1.7	81.7	3.6	81.7	1.7	0.0	(Cc.)
ST22KMB5-13	263	295	0.9	0.05	0.00	0.01	0.00	0.09	0.00	0.68	209.1	45.0	86.1	1.6	89.7	2.4	85.8	48.5	85.8	1.5	85.8	2.3	85.8	1.5	0.0	(Cc.)
OD-3 zircon	541	403	1.3	0.05	0.00	0.01	0.00	0.03	0.00	0.56	89.8	65.3	33.0	0.6	33.4	1.1	32.9	67.6	32.9	0.6	32.9	1.1	32.9	0.6	0.0	(Cc.)
GJ-1 zircon	37	501	0.1	0.06	0.00	0.10	0.00	0.83	0.01	0.95	626.5	12.0	607.1	9.9	606.8	8.3	606.7	12.1	606.8	9.9	606.8	8.2	606.8	9.9	0.0	(Cc.)
NIST SRM 612	36	12	2.9	0.91	0.00	0.87	0.03	110.22	3.74	1.00	5113.5	3.3	4045.0	101.0	4774.3	33.9	2286.4	25.0	2286.4	31.8	2286.4	20.0	2286.4	25.0	0.0	(Cc.)
NIST SRM 612	35	12	2.9	0.91	0.00	0.88	0.03	111.41	3.83	1.00	5115.4	3.2	4073.1	102.8	4785.0	34.3	2294.5	24.7	2294.5	32.1	2294.5	20.0	2294.5	24.7	0.0	(Cc.)
NIST SRM 612	32	12	2.7	0.91	0.00	0.85	0.03	107.91	3.71	1.00	5114.5	3.2	3979.6	101.1	4753.0	34.3	2262.5	25.2	2262.5	32.2	2262.5	20.2	2262.5	25.2	0.0	(Cc.)
91500 zircon	47	96	0.5	0.07	0.00	0.18	0.00	1.83	0.04	0.93	1084.9	15.9	1045.0	19.0	1051.6	14.0	1043.2	16.3	1043.2	19.0	1043.2	13.9	1043.2	16.3	0.0	(Cc.)

91500 zircon	45	90	0.5	0.08	0.00	0.18	0.00	1.85	0.04	0.93	1097.8	16.3	1045.4	19.2	1056.1	14.2	1043.1	16.8	1043.1	19.2	1043.1	14.0	1043.1	16.8	0.0	(Cc.)
91500 zircon	48	100	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.93	1110.3	15.3	1067.5	19.2	1075.2	14.1	1065.5	15.7	1065.5	19.2	1065.5	13.9	1065.5	15.7	0.0	(Cc.)
NIST SRM 612	40	13	3.1	0.91	0.01	0.85	0.03	107.76	3.75	0.96	5114.8	13.5	3974.7	98.6	4753.8	33.6	5097.8	13.7	5098.0	167.0	5097.8	48.8	5097.8	13.7	0.0	(Cc.)
NIST SRM 612	39	12	3.2	0.91	0.01	0.90	0.03	112.74	3.99	0.96	5107.8	13.5	4125.6	102.9	4799.2	34.2										
NIST SRM 612	37	12	3.1	0.91	0.01	0.89	0.03	112.71	4.04	0.96	5109.8	13.5	4120.4	104.3	4798.9	34.6	5096.5	13.7	5096.0	164.0	5096.5	47.9	5096.5	13.7	0.0	(Cc.)
91500 zircon	54	107	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.83	1102.0	24.1	1072.2	17.9	1077.1	13.3	1070.8	24.6	1070.8	17.9	1070.8	14.5	1070.8	24.6	0.0	(Cc.)
91500 zircon	53	111	0.5	0.08	0.00	0.18	0.00	1.84	0.04	0.83	1084.9	24.1	1049.5	17.4	1056.2	13.1	1047.9	24.7	1047.9	17.4	1047.9	14.2	1047.9	24.7	0.0	(Cc.)
91500 zircon	47	93	0.5	0.08	0.00	0.18	0.00	1.91	0.04	0.83	1086.2	24.7	1084.0	18.5	1079.7	13.7	1083.8	24.8	1083.8	18.5	1083.8	14.9	1083.8	24.8	0.0	(Cc.)
ST22KMB5-14	622	808	0.8	0.05	0.00	0.01	0.00	0.08	0.00	0.69	399.2	37.0	64.1	1.0	73.2	1.5	63.5	45.5	63.5	1.0	63.5	1.5	63.5	1.0	0.0	(Cc.)
ST22KMB5-15	799	440	1.8	0.06	0.00	0.06	0.00	0.50	0.01	0.80	591.5	25.8	381.4	5.8	410.2	6.0	378.9	29.5	379.0	5.8	379.0	6.4	379.0	5.8	0.0	(Cc.)
ST22KMB5-16	273	408	0.7	0.05	0.00	0.01	0.00	0.09	0.00	0.63	180.7	46.1	84.3	1.4	87.1	2.1	84.1	48.9	84.1	1.3	84.1	2.1	84.1	1.3	0.0	(Cc.)
ST22KMB5-17	322	342	0.9	0.05	0.00	0.01	0.00	0.10	0.00	0.62	142.2	48.6	91.5	1.5	92.8	2.3	91.4	50.1	91.4	1.5	91.4	2.3	91.4	1.5	0.0	(Cc.)
ST22KMB5-18	1125	930	1.2	0.05	0.00	0.01	0.00	0.09	0.00	0.72	171.1	34.9	85.3	1.3	87.7	1.7	85.1	36.8	85.1	1.3	85.1	1.8	85.1	1.3	0.0	(Cc.)
ST22KMB5-19	183	352	0.5	0.09	0.00	0.01	0.00	0.13	0.00	0.68	1367.8	34.4	69.8	1.2	124.1	2.8	66.3	78.5	66.3	1.0	66.3	2.4	66.3	1.0	0.0	(Cc.)
ST22KMB5-20	117	515	0.2	0.06	0.00	0.06	0.00	0.43	0.01	0.79	434.7	26.5	353.7	5.4	362.3	5.4	352.8	27.9	352.8	5.3	352.8	5.9	352.8	5.3	0.0	(Cc.)
ST22KMB5-21	344	311	1.1	0.06	0.00	0.06	0.00	0.48	0.01	0.78	496.3	28.4	381.5	6.0	395.8	6.2	380.2	30.5	380.2	5.9	380.2	6.7	380.2	5.9	0.0	(Cc.)
ST22KMB5-22	220	265	0.8	0.06	0.00	0.07	0.00	0.55	0.01	0.78	529.1	28.3	431.9	6.8	444.9	6.9	430.6	30.1	430.6	6.8	430.6	7.4	430.6	6.8	0.0	(Cc.)
ST22KMB5-23	605	809	0.7	0.07	0.00	0.01	0.00	0.10	0.00	0.72	1013.7	30.1	65.2	1.0	98.1	1.9	63.1	54.6	63.1	1.0	63.1	1.7	<u>63.1</u>	<u>1.0</u>	0.0	(Cc.)
ST22KMB5-24	291	354	0.8	0.05	0.00	0.01	0.00	0.11	0.00	0.64	290.5	44.6	95.0	1.5	102.2	2.4	94.5	50.3	94.5	1.5	94.5	2.4	94.5	1.5	0.0	(Cc.)
ST22KMB5-25	530	558	0.9	0.05	0.00	0.01	0.00	0.10	0.00	0.68	254.1	39.3	89.0	1.4	94.5	2.0	88.6	43.5	88.6	1.4	88.6	2.1	88.6	1.4	0.0	(Cc.)
ST22KMB5-26	66	100	0.7	0.06	0.00	0.06	0.00	0.49	0.01	0.72	639.4	38.2	362.8	6.6	400.4	8.2	359.7	45.5	359.7	6.5	359.7	8.3	359.7	6.5	0.0	(Cc.)
OD-3 zircon	1344	796	1.7	0.05	0.00	0.01	0.00	0.03	0.00	0.58	42.5	53.9	33.1	0.5	33.0	0.9	33.1	54.2	33.1	0.5	33.1	0.9	33.1	0.5	0.0	(Cc.)
GJ-1 zircon	34	476	0.1	0.06	0.00	0.10	0.00	0.82	0.02	0.82	627.0	23.7	602.7	8.9	604.4	7.7	602.2	24.0	602.2	9.0	602.2	8.7	602.2	9.0	0.0	(Cc.)
NIST SRM 612	35	12	3.0	0.90	0.01	0.84	0.03	105.24	3.79	0.96	5103.1	13.5	3929.2	101.2	4729.9	34.8	5091.2	13.6	5091.0	175.0	5091.2	51.0	5091.2	13.6	0.0	(Cc.)
NIST SRM 612	41	14	3.0	0.91	0.01	0.81	0.03	101.96	3.47	0.96	5110.7	13.5	3821.3	93.4	4698.1	32.8										
NIST SRM 612	31	12	2.7	0.91	0.01	0.78	0.03	98.56	3.56	0.96	5118.5	13.5	3709.2	97.6	4664.1	35.0	5096.9	13.7	5097.0	190.0	5096.9	55.4	5096.9	13.7	0.0	(Cc.)
91500 zircon	47	93	0.5	0.08	0.00	0.18	0.00	1.84	0.04	0.83	1083.8	25.0	1048.4	18.0	1055.0	13.6	1046.8	25.6	1046.8	17.9	1046.8	14.7	1046.8	25.6	0.0	(Cc.)
91500 zircon	42	86	0.5	0.07	0.00	0.18	0.00	1.84	0.04	0.83	1067.5	25.5	1054.4	18.3	1053.8	13.8	1053.8	25.7	1053.8	18.3	1053.8	14.9	1053.8	25.7	0.0	(Cc.)
91500 zircon	47	93	0.5	0.07	0.00	0.18	0.00	1.87	0.04	0.83	1075.6	24.9	1069.7	18.3	1066.7	13.6	1069.4	25.0	1069.4	18.3	1069.4	14.8	1069.4	25.0	0.0	(Cc.)
NIST SRM 612	37	12	3.1	0.90	0.01	0.84	0.03	105.21	3.62	0.96	5102.5	13.4	3929.9	96.6	4727.8	33.6										
NIST SRM 612	43	14	3.1	0.91	0.01	0.81	0.03	101.93	3.30	0.96	5110.1	13.4	3822.0	88.6	4696.0	31.5										

NIST SRM 612	32	12	2.7	0.91	0.01	0.78	0.03	98.54	3.41	0.96	5117.8	13.4	3709.9	93.2	4661.9	33.8	5096.6	13.6	5097.0	182.0	5096.6	52.9	5096.6	13.6	0.0	(Cc.)
91500 zircon	49	94	0.5	0.07	0.00	0.18	0.00	1.84	0.04	0.78	1082.9	24.8	1048.6	14.9	1053.6	12.2	1047.1	25.4	1047.1	14.9	1047.1	13.0	1047.1	25.4	0.0	(Cc.)
91500 zircon	44	87	0.5	0.07	0.00	0.18	0.00	1.84	0.04	0.78	1066.5	25.3	1054.6	15.3	1052.4	12.5	1054.1	25.5	1054.1	15.3	1054.1	13.2	1054.1	25.5	0.0	(Cc.)
91500 zircon	49	95	0.5	0.07	0.00	0.18	0.00	1.87	0.04	0.78	1074.7	24.7	1069.9	15.1	1065.3	12.2	1069.7	24.8	1069.7	15.1	1069.7	13.0	1069.7	24.8	0.0	(Cc.)
ST22KMB5-27	330	394	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.48	0.0	54.9	64.9	0.8	62.5	1.6	64.9	53.3	64.9	0.8	64.9	1.6	64.9	0.8	0.0	(Cc.)
ST22KMB5-28	950	1067	0.9	0.05	0.00	0.03	0.00	0.19	0.00	0.67	240.8	28.0	168.8	1.8	172.2	2.4	168.5	29.2	168.5	1.8	168.5	2.6	168.5	1.8	0.0	(Cc.)
ST22KMB5-29	1463	1437	1.0	0.05	0.00	0.01	0.00	0.09	0.00	0.64	121.5	31.5	85.3	0.9	85.8	1.3	85.2	32.2	85.2	1.0	85.2	1.4	85.2	1.0	0.0	(Cc.)
ST22KMB5-30	433	503	0.9	0.05	0.00	0.01	0.00	0.09	0.00	0.55	153.9	43.5	82.6	1.0	84.3	1.8	82.5	45.5	82.5	1.0	82.5	1.8	82.5	1.0	0.0	(Cc.)
ST22KMB5-31	818	702	1.2	0.05	0.00	0.02	0.00	0.10	0.00	0.59	124.3	37.0	96.6	1.1	96.8	1.7	96.5	37.7	96.5	1.1	96.5	1.8	96.5	1.1	0.0	(Cc.)
ST22KMB5-32	305	304	1.0	0.05	0.00	0.01	0.00	0.08	0.00	0.49	178.9	54.5	75.6	1.0	78.2	2.0	75.4	58.0	75.4	1.0	75.4	2.0	75.4	1.0	0.0	(Cc.)
ST22KMB5-33	143	172	0.8	0.05	0.00	0.01	0.00	0.07	0.00	0.43	90.6	76.4	66.5	1.0	66.6	2.4	66.5	77.5	66.5	1.0	66.5	2.3	66.5	1.0	0.0	(Cc.)
ST22KMB5-34	149	274	0.5	0.13	0.00	0.01	0.00	0.20	0.00	0.64	2093.4	29.1	71.2	1.0	182.2	3.6	63.8	108.0	63.8	0.8	63.8	2.9	63.8	0.8	0.0	(Cc.)
ST22KMB5-35	838	889	0.9	0.05	0.00	0.01	0.00	0.07	0.00	0.57	99.6	38.8	69.2	0.8	69.4	1.3	69.1	39.5	69.1	0.8	69.1	1.4	69.1	0.8	0.0	(Cc.)
ST22KMB5-36	367	351	1.0	0.05	0.00	0.01	0.00	0.09	0.00	0.52	193.2	48.7	84.5	1.1	87.6	2.0	84.3	52.0	84.3	1.1	84.3	2.1	84.3	1.1	0.0	(Cc.)
ST22KMB5-37	79	78	1.0	0.06	0.00	0.08	0.00	0.65	0.02	0.69	478.4	38.7	518.1	8.2	507.1	9.4	518.8	37.7	518.8	8.2	518.8	9.7	518.8	8.2	0.0	(Cc.)
ST22KMB5-38	74	102	0.7	0.04	0.00	0.01	0.00	0.07	0.00	0.40	0.0	97.4	69.3	1.2	65.8	3.0	69.2	94.4	69.3	1.2	69.3	2.9	69.3	1.2	0.0	(Cc.)
ST22KMB5-39	646	815	0.8	0.05	0.00	0.01	0.00	0.09	0.00	0.59	120.2	36.8	85.7	1.0	86.1	1.5	85.6	37.6	85.6	1.0	85.6	1.6	85.6	1.0	0.0	(Cc.)
OD-3 zircon	585	409	1.4	0.05	0.00	0.01	0.00	0.03	0.00	0.41	52.5	72.4	32.7	0.4	32.7	1.1	32.7	73.3	32.7	0.5	32.7	1.1	32.7	0.5	0.0	(Cc.)
GJ-1 zircon	37	498	0.1	0.06	0.00	0.10	0.00	0.82	0.01	0.73	604.6	23.5	606.8	6.7	602.1	6.5	606.9	23.5	606.9	6.7	606.9	7.2	606.9	6.7	0.0	(Cc.)
NIST SRM 612	39	13	3.0	0.90	0.01	0.87	0.03	108.99	3.61	0.96	5106.2	13.4	4026.7	94.3	4763.3	32.3										
NIST SRM 612	37	11	3.3	0.92	0.01	0.94	0.03	119.40	4.22	0.96	5126.6	13.4	4261.5	105.2	4855.1	34.5	5108.4	13.5	5108.0	155.0	5108.4	45.3	5108.4	13.5	0.0	(Cc.)
NIST SRM 612	35	12	2.9	0.91	0.01	0.85	0.03	107.45	3.66	0.96	5117.3	13.4	3960.9	96.2	4748.9	33.3	5099.0	13.5	5099.0	164.0	5099.0	47.9	5099.0	13.5	0.0	(Cc.)
91500 zircon	48	92	0.5	0.07	0.00	0.18	0.00	1.87	0.04	0.78	1067.7	24.9	1072.8	15.3	1064.9	12.3	1073.0	24.8	1073.0	15.3	1073.0	13.1	1073.0	24.8	0.0	(Cc.)
91500 zircon	52	99	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.78	1102.7	24.4	1060.1	14.8	1067.9	12.1	1058.1	25.1	1058.1	14.8	1058.1	12.9	1058.1	25.1	0.0	(Cc.)
91500 zircon	56	106	0.5	0.08	0.00	0.18	0.00	1.91	0.04	0.78	1105.6	24.0	1072.2	14.7	1077.1	11.9	1070.7	24.6	1070.7	14.7	1070.7	12.7	1070.7	24.6	0.0	(Cc.)
NIST SRM 612	39	13	2.9	0.90	0.01	0.84	0.02	105.15	3.21	0.97	5101.2	10.5	3930.8	86.4	4731.4	30.2	5090.2	10.5	5090.0	149.0	5090.2	43.4	5090.2	10.5	0.0	(Cc.)
NIST SRM 612	38	12	3.0	0.91	0.01	0.85	0.03	106.42	3.36	0.97	5106.1	10.5	3955.9	90.0	4743.4	31.3	5093.0	10.6	5093.0	153.0	5093.0	44.6	5093.0	10.6	0.0	(Cc.)
NIST SRM 612	35	12	2.9	0.90	0.01	0.84	0.03	104.82	3.30	0.97	5094.5	10.4	3935.5	89.6	4728.2	31.2	5086.6	10.5	5087.0	154.0	5086.6	44.7	5086.6	10.5	0.0	(Cc.)
91500 zircon	49	98	0.5	0.08	0.00	0.18	0.00	1.86	0.03	0.79	1079.0	21.0	1061.1	13.2	1063.6	11.1	1060.3	21.2	1060.3	13.2	1060.3	11.3	1060.3	21.2	0.0	(Cc.)
91500 zircon	45	90	0.5	0.08	0.00	0.18	0.00	1.91	0.03	0.80	1100.8	21.2	1074.8	13.8	1080.0	11.4	1073.6	21.6	1073.6	13.7	1073.6	11.6	1073.6	21.6	0.0	(Cc.)
91500 zircon	49	93	0.5	0.08	0.00	0.18	0.00	1.87	0.03	0.79	1096.0	21.1	1055.5	13.4	1065.3	11.2	1053.6	21.7	1053.6	13.4	1053.6	11.4	1053.6	21.7	0.0	(Cc.)

ST22KMB5-40	288	329	0.9	0.05	0.00	0.01	0.00	0.08	0.00	0.47	110.4	49.7	75.5	0.8	76.2	1.8	75.4	50.8	75.4	0.8	75.4	1.8	75.4	0.8	0.0	(Cc.)
ST22KMB5-41	144	213	0.7	0.08	0.00	0.01	0.00	0.12	0.00	0.52	1231.2	41.2	67.0	0.9	112.0	2.7	64.1	86.0	64.1	0.8	64.1	2.4	64.1	0.8	0.0	(Cc.)
ST22KMB5-42	386	402	1.0	0.05	0.00	0.01	0.00	0.07	0.00	0.46	0.0	49.6	66.2	0.7	63.9	1.5	66.2	48.2	66.3	0.7	66.3	1.5	66.3	0.7	0.0	(Cc.)
ST22KMB5-43	2151	3023	0.7	0.05	0.00	0.03	0.00	0.23	0.00	0.72	362.2	18.9	193.8	1.7	206.2	2.1	192.9	21.0	192.9	1.6	192.9	2.2	192.9	1.6	0.0	(Cc.)
ST22KMB5-44	238	283	0.8	0.05	0.00	0.06	0.00	0.43	0.01	0.67	406.8	26.2	357.9	3.7	362.9	4.8	357.3	27.0	357.3	3.7	357.3	4.8	357.3	3.7	0.0	(Cc.)
ST22KMB5-45	686	760	0.9	0.07	0.00	0.01	0.00	0.11	0.00	0.60	994.4	26.5	71.3	0.7	106.3	1.7	69.1	47.4	69.1	0.7	69.1	1.5	69.1	0.7	0.0	(Cc.)
ST22KMB5-46	445	654	0.7	0.05	0.00	0.01	0.00	0.09	0.00	0.55	233.3	35.0	79.8	0.8	84.6	1.5	79.5	38.4	79.5	0.8	79.5	1.5	79.5	0.8	0.0	(Cc.)
ST22KMB5-47	1622	873	1.8	0.05	0.00	0.03	0.00	0.19	0.00	0.65	221.7	24.8	175.9	1.6	178.3	2.3	175.7	25.5	175.7	1.6	175.7	2.3	175.7	1.6	0.0	(Cc.)
ST22KMB5-48	46	503	0.1	0.12	0.00	0.31	0.00	5.00	0.06	0.78	1891.5	13.9	1756.4	14.7	1814.6	9.7	1739.9	15.4	1739.9	14.5	1739.9	10.5	1739.9	15.4	0.0	(Cc.)
ST22KMB5-49	499	338	1.5	0.05	0.00	0.01	0.00	0.09	0.00	0.50	212.0	44.7	85.9	0.9	90.0	2.0	85.6	48.3	85.6	1.0	85.6	1.9	85.6	1.0	0.0	(Cc.)
ST22KMB5-50	93	104	0.9	0.06	0.00	0.04	0.00	0.33	0.01	0.60	483.8	41.0	265.5	3.6	287.7	5.9	263.7	47.0	263.8	3.6	263.8	5.7	263.8	3.6	0.0	(Cc.)
ST22KMB5-51	200	160	1.2	0.05	0.00	0.02	0.00	0.13	0.00	0.49	344.9	52.5	111.7	1.4	122.3	3.2	111.0	60.7	111.0	1.4	111.0	3.0	111.0	1.4	0.0	(Cc.)
ST22KMB5-52	384	434	0.9	0.05	0.00	0.01	0.00	0.07	0.00	0.49	250.1	44.3	65.9	0.7	70.8	1.5	65.6	49.6	65.6	0.7	65.6	1.5	65.6	0.7	0.0	(Cc.)
OD-3 zircon	1369	800	1.7	0.05	0.00	0.01	0.00	0.03	0.00	0.45	121.1	48.6	32.5	0.3	33.6	0.8	32.5	51.3	32.5	0.3	32.5	0.8	32.5	0.3	0.0	(Cc.)
GJ-1 zircon	36	496	0.1	0.06	0.00	0.10	0.00	0.81	0.01	0.73	643.2	19.3	594.6	5.5	602.4	5.7	593.7	19.9	593.7	5.5	593.7	6.0	593.7	5.5	0.0	(Cc.)
NIST SRM 612	35	12	3.0	0.91	0.01	0.86	0.03	108.93	3.52	0.97	5113.6	10.4	4009.5	93.3	4766.9	32.0	5097.5	10.5	5097.0	155.0	5097.5	45.0	5097.5	10.5	0.0	(Cc.)
NIST SRM 612	39	12	3.3	0.91	0.01	0.88	0.03	110.69	3.55	0.97	5112.2	10.4	4060.4	93.3	4783.0	31.8	5097.3	10.6	5097.0	151.0	5097.3	43.9	5097.3	10.6	0.0	(Cc.)
NIST SRM 612	37	13	2.9	0.91	0.01	0.81	0.02	102.77	3.19	0.97	5117.8	10.4	3829.8	86.6	4708.3	30.8	5097.8	10.6	5098.0	158.0	5097.8	45.8	5097.8	10.6	0.0	(Cc.)
91500 zircon	50	95	0.5	0.07	0.00	0.18	0.00	1.84	0.03	0.79	1069.4	21.2	1057.8	13.3	1058.2	11.1	1057.3	21.3	1057.3	13.3	1057.3	11.4	1057.3	21.3	0.0	(Cc.)
91500 zircon	49	91	0.5	0.07	0.00	0.18	0.00	1.87	0.03	0.79	1069.4	21.3	1071.8	13.7	1067.6	11.4	1071.9	21.3	1071.9	13.7	1071.9	11.6	1071.9	21.3	0.0	(Cc.)
91500 zircon	50	99	0.5	0.08	0.00	0.18	0.00	1.86	0.03	0.79	1085.5	20.9	1057.2	13.2	1063.1	11.0	1056.0	21.3	1056.0	13.2	1056.0	11.3	1056.0	21.3	0.0	(Cc.)
NIST SRM 612	36	12	3.0	0.91	0.01	0.87	0.03	109.72	3.39	1.02	5115.0	NA	4028.3	93.8	4766.8	31.7										
NIST SRM 612	41	12	3.3	0.90	0.00	0.88	0.03	111.49	3.41	1.02	5114.0	NA	4079.3	93.8	4782.9	31.5										
NIST SRM 612	39	13	2.9	0.91	0.01	0.82	0.02	103.51	3.06	1.02	5119.0	NA	3847.9	87.1	4708.2	30.5										
91500 zircon	52	99	0.5	0.07	0.00	0.18	0.00	1.86	0.03	0.96	1071.3	7.7	1063.9	13.6	1058.1	10.8	1063.6	7.7	1063.6	13.5	1063.6	9.5	1063.6	7.7	0.0	(Cc.)
91500 zircon	51	95	0.5	0.07	0.00	0.18	0.00	1.88	0.03	0.96	1071.3	8.2	1078.0	13.9	1067.5	11.0	1078.3	8.1	1078.3	14.0	1078.3	9.7	1078.3	8.1	0.0	(Cc.)
91500 zircon	51	103	0.5	0.07	0.00	0.18	0.00	1.87	0.03	0.97	1087.4	7.0	1063.3	13.4	1063.0	10.7	1062.3	7.1	1062.3	13.4	1062.3	9.3	1062.3	7.1	0.0	(Cc.)
ST22KMB5-53	858	863	1.0	0.05	0.00	0.01	0.00	0.07	0.00	0.66	309.5	25.7	63.9	0.6	69.9	1.2	63.5	29.9	63.5	0.6	63.5	1.0	63.5	0.6	0.0	(Cc.)
ST22KMB5-54	852	867	1.0	0.05	0.00	0.01	0.00	0.08	0.00	0.69	406.9	23.6	67.3	0.7	76.6	1.2	66.6	29.1	66.6	0.6	66.6	1.0	66.6	0.6	0.0	(Cc.)
ST22KMB5-55	225	184	1.2	0.05	0.00	0.03	0.00	0.25	0.00	0.67	268.1	31.5	221.5	2.7	223.0	4.1	221.2	32.4	221.2	2.7	221.2	3.7	221.2	2.7	0.0	(Cc.)
ST22KMB5-56	1092	699	1.5	0.05	0.00	0.01	0.00	0.07	0.00	0.62	251.1	30.2	63.8	0.7	68.1	1.3	63.4	33.9	63.4	0.6	63.4	1.1	63.4	0.6	0.0	(Cc.)

ST22KMB5-57	429	642	0.7	0.05	0.00	0.02	0.00	0.11	0.00	0.69	181.8	24.8	99.3	1.0	101.4	1.6	99.1	26.0	99.1	1.0	99.1	1.4	99.1	1.0	0.0	(Cc.)
ST22KMB5-58	739	686	1.1	0.05	0.00	0.01	0.00	0.09	0.00	0.66	100.3	27.4	84.3	0.8	83.9	1.4	84.3	27.7	84.3	0.8	84.3	1.3	84.3	0.8	0.0	(Cc.)
ST22KMB5-59	88	176	0.5	0.05	0.00	0.04	0.00	0.30	0.01	0.70	314.9	28.8	257.9	3.1	260.7	4.6	257.4	29.8	257.4	3.1	257.4	4.1	257.4	3.1	0.0	(Cc.)
ST22KMB5-60	67	146	0.5	0.18	0.00	0.45	0.01	11.56	0.12	1.14	2710.0	NA	2395.3	24.6	2557.8	12.2										
ST22KMB5-61	78	69	1.1	0.05	0.00	0.03	0.00	0.20	0.01	0.53	188.7	62.6	183.5	3.1	181.8	5.7	183.5	62.8	183.5	3.1	183.5	5.3	183.5	3.1	0.0	(Cc.)
ST22KMB5-62	253	130	1.9	0.05	0.00	0.03	0.00	0.18	0.00	0.56	211.9	47.5	160.6	2.2	162.0	4.0	160.3	49.0	160.3	2.2	160.3	3.7	160.3	2.2	0.0	(Cc.)
ST22KMB5-63	331	225	1.5	0.05	0.00	0.01	0.00	0.07	0.00	0.45	33.5	61.5	66.5	0.9	64.8	2.0	66.6	60.3	66.6	0.8	66.6	1.8	66.6	0.8	0.0	(Cc.)
ST22KMB5-64	108	179	0.6	0.05	0.00	0.01	0.00	0.07	0.00	0.45	326.9	62.5	64.0	0.9	70.6	2.3	63.6	73.5	63.6	0.9	63.6	2.1	63.6	0.9	0.0	(Cc.)
ST22KMB5-65	357	495	0.7	0.05	0.00	0.01	0.00	0.08	0.00	0.59	141.3	34.1	80.2	0.9	81.2	1.6	80.1	35.4	80.1	0.8	80.1	1.4	80.1	0.8	0.0	(Cc.)
OD-3 zircon	636	449	1.4	0.05	0.00	0.01	0.00	0.03	0.00	0.42	10.9	63.0	32.6	0.4	31.9	1.0	32.6	62.2	32.6	0.4	32.6	0.9	32.6	0.4	0.0	(Cc.)
GJ-1 zircon	34	465	0.1	0.06	0.00	0.10	0.00	0.81	0.01	1.07	631.0	NA	597.7	5.7	598.9	5.4										
NIST SRM 612	37	12	3.1	0.91	0.01	0.92	0.03	117.48	3.66	1.02	5123.0	NA	4219.8	97.9	4835.6	32.0										
NIST SRM 612	38	12	3.1	0.90	0.01	0.87	0.03	109.39	3.37	1.02	5113.0	NA	4024.2	93.5	4763.8	31.6										
NIST SRM 612	33	12	2.7	0.91	0.01	0.80	0.02	101.47	3.11	1.02	5125.0	NA	3778.9	88.9	4688.2	31.5										
91500 zircon	48	90	0.5	0.07	0.00	0.18	0.00	1.85	0.03	0.95	1069.3	9.1	1063.2	14.0	1056.9	11.1	1062.9	9.1	1062.9	14.0	1062.9	9.9	1062.9	9.1	0.0	(Cc.)
91500 zircon	42	85	0.5	0.08	0.00	0.18	0.00	1.86	0.03	0.95	1097.5	9.7	1054.2	14.1	1060.1	11.4	1052.2	10.0	1052.2	14.1	1052.2	10.0	1052.2	10.0	0.0	(Cc.)
91500 zircon	50	94	0.5	0.08	0.00	0.18	0.00	1.87	0.03	0.96	1103.9	8.3	1055.5	13.7	1063.1	11.0	1053.3	8.6	1053.3	13.6	1053.3	9.6	1053.3	8.6	0.0	(Cc.)
NIST SRM 612	39	12	3.2	0.91	0.00	0.93	0.03	118.22	4.10	0.91	5117.6	20.8	4250.2	97.1	4844.8	31.6										
NIST SRM 612	40	12	3.1	0.90	0.00	0.88	0.03	110.08	3.78	0.90	5107.7	20.8	4053.6	92.7	4773.0	31.2										
NIST SRM 612	35	13	2.7	0.91	0.01	0.80	0.02	102.11	3.49	0.90	5119.9	20.7	3806.9	88.2	4697.4	31.1										
91500 zircon	50	92	0.5	0.07	0.00	0.18	0.00	1.87	0.04	0.62	1062.2	33.6	1072.9	13.1	1063.0	10.6	1073.4	33.3	1073.4	13.2	1073.4	14.1	1073.4	33.3	0.0	(Cc.)
91500 zircon	43	87	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.63	1090.4	33.6	1063.7	13.3	1066.2	10.8	1062.5	34.2	1062.5	13.3	1062.5	14.3	1062.5	34.2	0.0	(Cc.)
91500 zircon	52	96	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.62	1096.9	33.2	1065.1	12.8	1069.2	10.5	1063.7	33.9	1063.7	12.8	1063.7	14.1	1063.7	33.9	0.0	(Cc.)
ST22KMB5-66	182	214	0.8	0.06	0.00	0.01	0.00	0.08	0.00	0.38	437.9	65.8	64.0	0.8	74.2	2.2	63.3	82.8	63.3	0.8	63.3	2.3	63.3	0.8	0.0	(Cc.)
ST22KMB5-67	293	323	0.9	0.05	0.00	0.01	0.00	0.07	0.00	0.38	184.4	60.1	69.6	0.7	72.3	1.8	69.4	64.4	69.4	0.8	69.4	2.0	69.4	0.8	0.0	(Cc.)
ST22KMB5-68	542	429	1.3	0.09	0.00	0.01	0.00	0.17	0.00	0.46	1499.3	35.7	84.9	0.8	158.9	2.5	80.0	88.1	80.0	0.7	80.0	2.9	80.0	0.7	0.0	(Cc.)
ST22KMB5-69	123	177	0.7	0.05	0.00	0.03	0.00	0.20	0.01	0.45	259.9	52.5	179.5	2.0	183.7	3.7	179.1	55.2	179.1	2.1	179.1	4.3	179.1	2.1	0.0	(Cc.)
ST22KMB5-70	895	823	1.1	0.05	0.00	0.02	0.00	0.17	0.00	0.43	239.7	39.6	152.3	1.2	156.3	1.9	152.0	41.8	152.0	1.3	152.0	2.8	152.0	1.3	0.0	(Cc.)
ST22KMB5-71	439	494	0.9	0.08	0.00	0.01	0.00	0.15	0.00	0.44	1204.7	37.1	88.0	0.8	142.6	2.2	84.4	75.2	84.4	0.8	84.4	2.7	84.4	0.8	0.0	(Cc.)
ST22KMB5-72	82	181	0.4	0.08	0.00	0.07	0.00	0.76	0.02	0.54	1100.4	34.3	449.7	4.7	569.2	6.5	438.6	52.2	438.6	4.5	438.6	9.2	438.6	4.5	0.0	(Cc.)
ST22KMB5-73	1195	492	2.4	0.05	0.00	0.01	0.00	0.07	0.00	0.38	210.0	53.7	63.7	0.6	67.1	1.4	63.5	58.7	63.5	0.6	63.5	1.6	63.5	0.6	0.0	(Cc.)

ST22KMB5-74	444	359	1.2	0.08	0.00	0.02	0.00	0.28	0.01	0.47	1214.7	35.3	158.1	1.5	245.7	3.3	151.9	69.1	151.9	1.4	151.9	4.4	151.9	1.4	0.0	(Cc.)
ST22KMB5-75	169	359	0.5	0.05	0.00	0.02	0.00	0.10	0.00	0.40	88.1	53.8	98.4	1.0	97.1	2.0	98.4	53.5	98.4	1.0	98.4	2.3	98.4	1.0	0.0	(Cc.)
ST22KMB5-76	487	261	1.8	0.10	0.00	0.03	0.00	0.34	0.01	0.50	1567.8	34.1	163.8	1.7	298.0	4.2	154.1	84.1	154.1	1.5	154.1	5.3	154.1	1.5	0.0	(Cc.)
ST22KMB5-77	76	78	1.0	0.05	0.00	0.02	0.00	0.18	0.01	0.45	335.6	70.9	158.6	2.5	168.8	5.2	157.8	79.1	157.8	2.4	157.8	5.5	157.8	2.4	0.0	(Cc.)
ST22KMB5-78	509	474	1.1	0.05	0.00	0.01	0.00	0.09	0.00	0.40	275.2	49.4	82.2	0.8	88.2	1.7	81.8	55.7	81.8	0.8	81.8	2.0	81.8	0.8	0.0	(Cc.)
OD-3 zircon	1571	887	1.8	0.05	0.00	0.01	0.00	0.04	0.00	0.36	185.6	55.2	33.2	0.3	35.0	0.8	33.0	60.5	33.1	0.3	33.1	0.9	33.1	0.3	0.0	(Cc.)
GJ-1 zircon	35	486	0.1	0.06	0.00	0.10	0.00	0.81	0.01	0.48	622.8	33.7	598.8	4.9	599.5	4.9	598.4	34.2	598.4	4.9	598.4	8.1	598.4	4.9	0.0	(Cc.)
NIST SRM 612	38	13	3.0	0.90	0.00	0.84	0.03	106.00	3.62	0.90	5110.2	20.8	3935.8	90.3	4735.0	31.0										
NIST SRM 612	37	12	3.0	0.91	0.01	0.84	0.03	106.82	3.71	0.91	5115.6	20.7	3947.0	92.2	4742.7	31.6										
NIST SRM 612	36	12	3.0	0.91	0.01	0.83	0.03	104.11	3.64	0.91	5111.9	20.8	3879.3	91.9	4716.9	31.9										
91500 zircon	43	85	0.5	0.07	0.00	0.18	0.00	1.81	0.04	0.63	1041.8	34.1	1053.7	13.3	1043.5	10.9	1054.2	33.8	1054.2	13.4	1054.2	14.2	1054.2	33.8	0.0	(Cc.)
91500 zircon	47	90	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.63	1114.5	33.3	1065.8	13.2	1075.5	10.7	1063.6	34.4	1063.6	13.1	1063.6	14.3	1063.6	34.4	0.0	(Cc.)
91500 zircon	42	87	0.5	0.08	0.00	0.18	0.00	1.87	0.04	0.63	1093.5	33.6	1057.0	13.3	1062.6	10.9	1055.3	34.5	1055.3	13.3	1055.3	14.3	1055.3	34.5	0.0	(Cc.)
NIST SRM 612	40	13	3.0	0.91	0.00	0.85	0.03	106.03	3.84	0.88	5102.9	24.6	3951.9	93.1	4743.6	31.8										
NIST SRM 612	39	13	3.0	0.91	0.00	0.85	0.03	106.85	3.92	0.88	5108.4	24.6	3963.1	95.0	4751.3	32.4										
NIST SRM 612	38	13	3.0	0.91	0.00	0.83	0.03	104.14	3.85	0.88	5104.7	24.6	3895.2	94.6	4725.4	32.7										
91500 zircon	45	90	0.5	0.07	0.00	0.18	0.00	1.81	0.05	0.63	1031.4	39.1	1059.0	15.2	1049.1	11.9	1060.3	38.4	1060.3	15.2	1060.3	16.2	1060.3	38.4	0.0	(Cc.)
91500 zircon	50	96	0.5	0.08	0.00	0.18	0.00	1.90	0.05	0.62	1104.2	38.3	1071.2	15.1	1081.1	11.8	1069.6	39.1	1069.6	15.1	1069.6	16.4	1069.6	39.1	0.0	(Cc.)
91500 zircon	45	92	0.5	0.08	0.00	0.18	0.00	1.87	0.05	0.63	1083.1	38.6	1062.3	15.2	1068.2	11.9	1061.4	39.1	1061.4	15.2	1061.4	16.4	1061.4	39.1	0.0	(Cc.)
ST22KMB5-79	562	974	0.6	0.05	0.00	0.01	0.00	0.08	0.00	0.47	180.3	49.5	76.4	0.8	79.6	1.3	76.2	52.7	76.2	0.8	76.2	1.8	76.2	0.8	0.0	(Cc.)
ST22KMB5-80	256	170	1.5	0.05	0.00	0.03	0.00	0.20	0.01	0.48	374.0	57.5	166.7	2.3	180.9	4.1	165.7	65.4	165.7	2.3	165.7	4.8	165.7	2.3	0.0	(Cc.)
ST22KMB5-81	1336	1269	1.0	0.05	0.00	0.01	0.00	0.09	0.00	0.47	153.0	47.6	81.1	0.9	83.4	1.3	80.9	49.8	81.0	0.9	81.0	1.8	81.0	0.9	0.0	(Cc.)
ST22KMB5-82	129	350	0.4	0.05	0.00	0.01	0.00	0.07	0.00	0.42	94.8	66.5	65.9	0.9	66.6	1.7	65.8	67.7	65.8	0.8	65.8	2.0	65.8	0.8	0.0	(Cc.)
ST22KMB5-83	551	738	0.7	0.05	0.00	0.01	0.00	0.07	0.00	0.45	238.3	52.5	66.1	0.8	70.9	1.3	65.8	58.4	65.8	0.8	65.8	1.7	65.8	0.8	0.0	(Cc.)
ST22KMB5-84	59	51	1.1	0.05	0.00	0.03	0.00	0.20	0.01	0.47	258.5	87.5	176.0	3.5	181.5	6.9	175.6	92.0	175.6	3.6	175.6	7.2	175.6	3.6	0.0	(Cc.)
ST22KMB5-85	507	888	0.6	0.05	0.00	0.03	0.00	0.22	0.00	0.50	233.9	44.1	199.1	2.2	201.6	2.6	198.9	45.1	198.9	2.1	198.9	4.0	198.9	2.1	0.0	(Cc.)
ST22KMB5-86	1825	1197	1.5	0.05	0.00	0.01	0.00	0.08	0.00	0.47	397.7	46.1	69.7	0.8	79.8	1.2	69.1	56.4	69.1	0.8	69.1	1.7	69.1	0.8	0.0	(Cc.)
ST22KMB5-87	35	116	0.3	0.05	0.00	0.04	0.00	0.26	0.01	0.50	220.5	60.4	239.9	3.6	237.8	5.5	240.0	59.7	240.0	3.6	240.0	6.4	240.0	3.6	0.0	(Cc.)
ST22KMB5-88	338	272	1.2	0.05	0.00	0.01	0.00	0.06	0.00	0.40	16.1	75.0	64.4	0.9	63.1	1.9	64.7	72.9	64.7	0.9	64.7	2.1	64.7	0.9	0.0	(Cc.)
ST22KMB5-89	114	130	0.9	0.05	0.00	0.01	0.00	0.07	0.00	0.39	270.1	90.6	63.7	1.1	69.3	2.8	63.3	102.9	63.4	1.1	63.4	2.9	63.4	1.1	0.0	(Cc.)
ST22KMB5-90	393	287	1.4	0.05	0.00	0.06	0.00	0.42	0.01	0.52	372.3	45.1	352.3	4.2	354.5	4.9	352.1	45.7	352.1	4.2	352.1	7.0	352.1	4.2	0.0	(Cc.)

ST22KMB5-91	440	265	1.6	0.05	0.00	0.01	0.00	0.07	0.00	0.42	310.8	67.9	65.9	0.9	72.9	2.1	65.5	78.9	65.5	0.9	65.5	2.3	65.5	0.9	0.0	(Cc.)
OD-3 zircon	1695	951	1.8	0.05	0.00	0.01	0.00	0.03	0.00	0.42	71.8	61.4	33.5	0.4	34.0	0.8	33.5	62.9	33.5	0.4	33.5	1.0	33.5	0.4	0.0	(Cc.)
GJ-1 zircon	36	494	0.1	0.06	0.00	0.10	0.00	0.81	0.02	0.53	605.8	39.5	603.5	6.6	603.3	5.9	603.5	39.6	603.5	6.6	603.5	9.8	603.5	6.6	0.0	(Cc.)
NIST SRM 612	34	12	2.8	0.91	0.00	0.84	0.03	105.08	3.92	0.88	5101.7	24.6	3927.9	96.4	4734.5	33.1										
NIST SRM 612	36	12	3.1	0.90	0.00	0.88	0.03	110.05	4.19	0.89	5097.6	24.6	4074.2	101.3	4781.0	33.9										
NIST SRM 612	35	11	3.2	0.90	0.00	0.91	0.03	113.10	4.43	0.90	5098.4	24.6	4155.5	106.6	4808.5	35.1										
91500 zircon	52	102	0.5	0.08	0.00	0.18	0.00	1.87	0.05	0.62	1108.8	38.1	1053.3	14.6	1070.6	11.5	1050.8	39.6	1050.8	14.6	1050.8	16.2	1050.8	39.6	0.0	(Cc.)
91500 zircon	49	97	0.5	0.07	0.00	0.18	0.00	1.84	0.05	0.62	1071.3	38.5	1054.0	14.8	1058.7	11.6	1053.2	39.0	1053.2	14.8	1053.2	16.2	1053.2	39.0	0.0	(Cc.)
91500 zircon	47	90	0.5	0.08	0.00	0.18	0.00	1.91	0.05	0.63	1100.0	38.5	1078.4	15.4	1084.6	12.0	1077.3	39.0	1077.3	15.5	1077.3	16.5	1077.3	39.0	0.0	(Cc.)
NIST SRM 612	41	12	3.3	0.91	0.01	0.85	0.03	108.14	3.88	0.94	5125.4	16.7	3962.9	99.6	4748.5	34.8										
NIST SRM 612	38	13	2.9	0.92	0.01	0.80	0.03	103.29	3.62	0.94	5138.9	16.7	3801.2	94.2	4702.4	33.9										
NIST SRM 612	38	13	3.0	0.90	0.01	0.79	0.03	99.96	3.54	0.94	5110.6	16.7	3765.1	94.4	4669.5	34.2										
91500 zircon	48	94	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.78	1136.2	28.4	1045.3	16.9	1064.5	13.9	1041.2	30.2	1041.2	16.8	1041.2	15.0	1041.2	30.2	0.0	(Cc.)
91500 zircon	45	89	0.5	0.07	0.00	0.18	0.00	1.88	0.04	0.78	1072.9	28.9	1075.7	17.6	1064.1	14.1	1075.8	28.8	1075.8	17.6	1075.8	15.2	1075.8	28.8	0.0	(Cc.)
91500 zircon	43	88	0.5	0.07	0.00	0.18	0.00	1.81	0.04	0.78	1034.7	29.3	1053.4	17.3	1036.8	14.0	1054.3	28.9	1054.3	17.3	1054.3	15.0	1054.3	28.9	0.0	(Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 89
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age})/(^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

C.2 Yasukuni Unit (ST20YSK1)

U-Pb LA-ICP-MS Detrital Zircon Data of Kamibaro Unit

Sample Location: Station-20, Saroma Area, Eastern Hokkaido, Japan

Unit / Group: Yasukuni Unit / Yubetsu Group

Belt: Tokoro Belt

Sample Type: Sandstone

Grain Number	Th (PPM)	U (PPM)	Th /U	Isotopic Ratios							U-Pb Age (Ma)						U-Pb Age (Ma)						Preferre d Age	± 1σ	Disc. (%)	
											before Stacey-Kramers Correction						after Stacey-Kramers Correction									
				207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ	207Pb/ 235U	± 1σ	Error Corr.	207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ	207Pb/ 235U	± 1σ	207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ	207Pb/ 235U	± 1σ				
ST20YSK1-1	176	204	0.9	0.05	0.00	0.01	0.00	0.07	0.00	0.58	221.2	63.6	62.6	1.2	66.4	2.3	62.3	70.0	62.3	1.2	62.3	2.1	62.3	1.2	0.0	(Cc.)
ST20YSK1-2	41	69	0.6	0.05	0.00	0.01	0.00	0.07	0.00	0.45	161.0	115.0	61.8	1.5	64.0	3.6	61.6	121.7	61.6	1.5	61.6	3.4	61.6	1.5	0.0	(Cc.)
ST20YSK1-3	474	461	1.0	0.05	0.00	0.01	0.00	0.07	0.00	0.70	122.6	42.4	62.9	1.1	64.2	1.7	62.8	44.0	62.8	1.1	62.8	1.6	62.8	1.1	0.0	(Cc.)
ST20YSK1-4	244	282	0.9	0.05	0.00	0.01	0.00	0.07	0.00	0.62	166.0	55.0	62.1	1.2	64.5	2.0	61.9	58.6	61.9	1.1	61.9	1.9	61.9	1.1	0.0	(Cc.)
ST20YSK1-5	474	735	0.6	0.05	0.00	0.01	0.00	0.07	0.00	0.80	298.5	29.8	63.2	1.1	69.4	1.6	62.9	34.4	62.9	1.1	62.9	1.4	62.9	1.1	0.0	(Cc.)
ST20YSK1-6	221	271	0.8	0.08	0.00	0.01	0.00	0.11	0.00	0.72	1109.3	35.7	66.3	1.2	104.6	2.8	63.8	68.9	63.8	1.1	63.8	2.1	63.8	1.1	0.0	(Cc.)
ST20YSK1-7	674	602	1.1	0.05	0.00	0.01	0.00	0.06	0.00	0.75	99.8	36.8	62.9	1.1	63.6	1.5	62.9	37.7	62.9	1.1	62.9	1.4	62.9	1.1	0.0	(Cc.)
ST20YSK1-8	345	406	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.68	82.2	46.6	62.6	1.1	62.8	1.7	62.6	47.2	62.6	1.2	62.6	1.6	62.6	1.2	0.0	(Cc.)
ST20YSK1-9	479	630	0.8	0.06	0.00	0.01	0.00	0.08	0.00	0.80	561.2	28.6	64.3	1.1	79.0	1.8	63.3	38.9	63.3	1.1	63.3	1.5	63.3	1.1	0.0	(Cc.)
ST20YSK1-10	340	310	1.1	0.06	0.00	0.01	0.00	0.08	0.00	0.68	501.6	44.3	64.4	1.2	77.0	2.2	63.5	58.0	63.5	1.1	63.5	1.9	63.5	1.1	0.0	(Cc.)
ST20YSK1-11	106	211	0.5	0.07	0.00	0.01	0.00	0.10	0.00	0.67	1026.0	42.9	65.0	1.2	98.7	2.9	62.8	78.5	62.8	1.2	62.8	2.3	62.8	1.2	0.0	(Cc.)
ST20YSK1-12	212	295	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.63	127.0	54.6	62.2	1.1	63.5	1.9	62.1	56.8	62.1	1.2	62.1	1.8	62.1	1.2	0.0	(Cc.)
ST20YSK1-13	83	155	0.5	0.06	0.00	0.01	0.00	0.08	0.00	0.58	496.5	62.7	67.2	1.4	80.1	2.9	66.4	81.7	66.4	1.3	66.4	2.6	66.4	1.3	0.0	(Cc.)
OD-3 zircon	679	433	1.5	0.05	0.00	0.01	0.00	0.03	0.00	0.57	103.8	63.5	32.4	0.6	33.2	1.1	32.4	66.3	32.4	0.6	32.4	1.1	32.4	0.6	0.0	(Cc.)
GJ-1 zircon	40	530	0.1	0.06	0.00	0.10	0.00	0.83	0.01	1.03	643.0	NA	604.1	9.8	610.1	8.3										
NIST SRM 612	37	11	3.2	0.91	0.00	0.91	0.03	114.93	4.08	1.02	5106.0	NA	4187.3	110.1	4820.9	36.0										
NIST SRM 612	35	12	3.0	0.91	0.00	0.85	0.03	106.54	3.75	1.02	5108.0	NA	3954.6	104.9	4744.6	35.7										
NIST SRM 612	38	13	3.0	0.91	0.00	0.88	0.03	110.74	3.76	1.02	5112.0	NA	4061.6	103.2	4783.5	34.5										
91500 zircon	60	112	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.99	1079.0	6.8	1073.8	19.2	1072.1	13.9	1073.6	6.8	1073.6	19.2	1073.6	13.0	1073.6	6.8	0.0	(Cc.)
91500 zircon	50	97	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.98	1080.8	8.8	1069.7	19.5	1069.9	14.3	1069.2	8.9	1069.2	19.5	1069.2	13.4	1069.2	8.9	0.0	(Cc.)

91500 zircon	51	104	0.5	0.08	0.00	0.18	0.00	1.83	0.04	0.98	1079.3	8.2	1042.7	18.9	1051.2	13.9	1041.1	8.4	1041.1	18.8	1041.1	13.0	1041.1	8.4	0.0	(Cc.)
NIST SRM 612	38	12	3.2	0.90	0.00	0.92	0.03	115.55	4.11	1.03	5108.0	NA	4201.1	112.1	4823.6	36.6										
NIST SRM 612	37	12	3.0	0.91	0.00	0.85	0.03	107.12	3.77	1.03	5110.0	NA	3967.9	106.9	4747.3	36.3										
NIST SRM 612	39	13	3.0	0.91	0.00	0.88	0.03	111.34	3.78	1.03	5114.0	NA	4075.1	105.2	4786.2	35.1										
91500 zircon	62	117	0.5	0.07	0.00	0.18	0.00	1.89	0.04	1.04	1081.0	NA	1078.3	20.3	1073.9	14.5										
91500 zircon	51	101	0.5	0.07	0.00	0.18	0.00	1.89	0.04	1.02	1083.0	NA	1074.1	20.6	1071.7	14.9										
91500 zircon	53	109	0.5	0.07	0.00	0.18	0.00	1.84	0.04	1.03	1081.0	NA	1047.0	20.0	1053.0	14.6										
ST20YSK1-14	173	246	0.7	0.21	0.00	0.01	0.00	0.36	0.01	0.97	2916.1	7.9	78.6	1.6	308.3	6.4	62.4	52.2	62.4	1.0	62.4	1.7	62.4	1.0	0.0	(Cc.)
ST20YSK1-15	270	307	0.9	0.05	0.00	0.01	0.00	0.06	0.00	0.65	50.8	54.3	62.7	1.2	62.0	2.0	62.8	53.9	62.8	1.2	62.8	1.8	62.8	1.2	0.0	(Cc.)
ST20YSK1-16	143	190	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.58	97.4	70.0	62.2	1.3	62.6	2.4	62.1	71.5	62.1	1.3	62.1	2.2	62.1	1.3	0.0	(Cc.)
ST20YSK1-17	221	170	1.3	0.06	0.00	0.06	0.00	0.47	0.01	0.93	653.6	16.9	351.1	6.8	391.4	7.7	347.7	20.4	347.8	6.7	347.8	6.4	347.8	6.7	0.0	(Cc.)
ST20YSK1-18	473	254	1.8	0.05	0.00	0.03	0.00	0.19	0.00	0.84	239.9	28.8	174.7	3.3	178.0	4.1	174.5	30.0	174.5	3.3	174.5	3.7	174.5	3.3	0.0	(Cc.)
ST20YSK1-19	306	467	0.6	0.08	0.00	0.01	0.00	0.12	0.00	0.87	1295.5	21.4	65.5	1.2	112.8	2.6	62.5	46.6	62.5	1.1	62.5	1.6	62.5	1.1	0.0	(Cc.)
ST20YSK1-20	140	318	0.4	0.05	0.00	0.02	0.00	0.10	0.00	0.75	48.7	41.1	96.2	1.8	93.6	2.5	96.4	39.9	96.4	1.9	96.4	2.4	96.4	1.9	0.0	(Cc.)
ST20YSK1-21	58	82	0.7	0.05	0.00	0.01	0.00	0.07	0.00	0.49	325.9	99.3	61.9	1.5	68.6	3.6	61.5	116.7	61.5	1.5	61.5	3.3	61.5	1.5	0.0	(Cc.)
ST20YSK1-22	472	528	0.9	0.05	0.00	0.01	0.00	0.07	0.00	0.76	101.5	37.9	63.4	1.2	63.9	1.7	63.3	38.8	63.3	1.2	63.3	1.5	63.3	1.2	0.0	(Cc.)
ST20YSK1-23	50	75	0.7	0.04	0.00	0.01	0.00	0.05	0.00	0.43	0.0	110.7	62.3	1.6	53.3	3.2	62.4	107.7	62.4	1.5	62.4	3.1	62.4	1.5	0.0	(Cc.)
ST20YSK1-24	9	51	0.2	0.15	0.00	0.03	0.00	0.57	0.02	0.84	2401.7	27.7	169.2	4.2	454.0	12.3	147.0	121.0	146.9	3.2	146.9	7.6	146.9	3.2	0.0	(Cc.)
ST20YSK1-25	761	579	1.3	0.07	0.00	0.01	0.00	0.11	0.00	0.89	1041.6	19.7	69.6	1.3	105.8	2.4	67.2	36.4	67.2	1.2	67.2	1.6	67.2	1.2	0.0	(Cc.)
ST20YSK1-26	657	858	0.8	0.05	0.00	0.01	0.00	0.07	0.00	0.85	156.4	26.4	61.8	1.1	63.7	1.5	61.6	28.0	61.6	1.1	61.6	1.3	61.6	1.1	0.0	(Cc.)
OD-3 zircon	1273	803	1.6	0.05	0.00	0.01	0.00	0.03	0.00	0.71	107.3	44.8	32.2	0.6	33.0	0.9	32.2	46.9	32.2	0.6	32.2	0.9	32.2	0.6	0.0	(Cc.)
GJ-I zircon	37	500	0.1	0.06	0.00	0.10	0.00	0.80	0.01	1.08	605.0	NA	592.0	10.4	591.2	8.7										
NIST SRM 612	37	12	3.0	0.91	0.00	0.87	0.03	110.29	3.88	1.03	5114.0	NA	4044.9	108.1	4776.7	36.2										
NIST SRM 612	34	13	2.7	0.91	0.00	0.85	0.03	107.88	3.73	1.03	5115.0	NA	3978.1	105.1	4754.5	35.6										
NIST SRM 612	38	12	3.2	0.90	0.00	0.94	0.03	117.96	4.19	1.03	5108.0	NA	4265.0	113.2	4844.4	36.5										
91500 zircon	54	107	0.5	0.08	0.00	0.18	0.00	1.86	0.04	1.03	1095.0	NA	1053.5	20.1	1062.0	14.7										
91500 zircon	56	112	0.5	0.08	0.00	0.18	0.00	1.83	0.04	1.03	1089.0	NA	1042.7	19.8	1052.6	14.5										
91500 zircon	50	94	0.5	0.07	0.00	0.18	0.00	1.89	0.04	1.02	1072.0	NA	1082.5	21.0	1073.7	15.1										
NIST SRM 612	38	12	3.2	0.91	0.01	0.88	0.03	111.33	3.84	1.06	5109.0	NA	4085.8	109.3	4785.9	36.6										
NIST SRM 612	35	12	2.8	0.91	0.01	0.87	0.03	108.91	3.70	1.06	5109.0	NA	4018.6	106.4	4763.7	36.1										
NIST SRM 612	38	12	3.3	0.90	0.01	0.95	0.03	119.08	4.15	1.05	5102.0	NA	4307.5	114.5	4853.6	37.0										

91500 zircon	54	104	0.5	0.08	0.00	0.18	0.00	1.88	0.04	1.10	1087.0	NA	1066.8	20.6	1068.0	15.2										
91500 zircon	57	109	0.5	0.07	0.00	0.18	0.00	1.85	0.03	1.11	1081.0	NA	1055.8	20.3	1058.6	15.0										
91500 zircon	51	92	0.6	0.07	0.00	0.19	0.00	1.91	0.04	1.09	1063.0	NA	1096.1	21.5	1079.8	15.6										
ST20YSK1-27	133	157	0.8	0.05	0.00	0.01	0.00	0.07	0.00	0.57	137.1	72.8	63.5	1.4	64.9	2.6	63.4	76.2	63.4	1.3	63.4	2.4	63.4	1.3	0.0	(Ce.)
ST20YSK1-28	170	244	0.7	0.05	0.00	0.01	0.00	0.07	0.00	0.65	193.3	55.0	62.5	1.3	65.4	2.2	62.3	59.6	62.3	1.3	62.3	2.0	62.3	1.3	0.0	(Ce.)
ST20YSK1-29	300	380	0.8	0.05	0.00	0.01	0.00	0.09	0.00	0.80	177.2	33.7	81.6	1.6	84.2	2.3	81.4	35.7	81.4	1.6	81.4	1.9	81.4	1.6	0.0	(Ce.)
ST20YSK1-30	79	141	0.6	0.07	0.00	0.01	0.00	0.10	0.00	0.66	980.5	51.3	65.9	1.4	97.6	3.5	63.8	91.1	63.8	1.4	63.8	2.7	63.8	1.4	0.0	(Ce.)
ST20YSK1-31	2098	1434	1.4	0.06	0.00	0.01	0.00	0.09	0.00	1.07	645.0	NA	65.5	1.2	83.3	1.7										
ST20YSK1-32	243	263	0.9	0.05	0.00	0.01	0.00	0.07	0.00	0.67	182.8	53.2	61.9	1.2	64.5	2.1	61.7	57.2	61.7	1.3	61.7	1.9	61.7	1.3	0.0	(Ce.)
ST20YSK1-33	2159	1684	1.3	0.05	0.00	0.01	0.00	0.07	0.00	1.05	125.0	NA	63.2	1.2	64.4	1.4										
ST20YSK1-34	473	463	1.0	0.05	0.00	0.01	0.00	0.06	0.00	0.77	28.0	38.2	63.5	1.2	62.1	1.7	63.6	37.3	63.6	1.2	63.6	1.5	63.6	1.2	0.0	(Ce.)
ST20YSK1-35	1703	1732	1.0	0.05	0.00	0.01	0.00	0.07	0.00	1.07	304.0	NA	63.6	1.2	69.7	1.5										
ST20YSK1-36	2899	1915	1.5	0.05	0.00	0.01	0.00	0.07	0.00	1.09	383.0	NA	64.0	1.2	72.5	1.5										
ST20YSK1-37	157	199	0.8	0.05	0.00	0.01	0.00	0.10	0.00	0.70	406.3	46.7	84.2	1.7	95.5	3.0	83.5	57.0	83.5	1.7	83.5	2.5	83.5	1.7	0.0	(Ce.)
ST20YSK1-38	157	84	1.8	0.19	0.00	0.03	0.00	0.75	0.02	0.99	2724.9	5.7	184.8	4.1	566.9	12.0	152.9	30.8	152.9	2.8	152.9	3.2	152.9	2.8	0.0	(Ce.)
ST20YSK1-39	473	457	1.0	0.09	0.00	0.01	0.00	0.13	0.00	0.94	1439.2	13.3	66.0	1.3	121.9	2.9	62.4	31.9	62.4	1.1	62.4	1.4	62.4	1.1	0.0	(Ce.)
OD-3 zircon	2	0	-6.2	-0.26	nan	0.00	0.00	0.14	nan				-25.6	-5.7	132.7	nan										
GJ-1 zircon	-800	5	-166.6	0.06	0.00	10.96	0.58	93.48	4.85	1.02			15997.4	305.4	4610.1	52.3										
NIST SRM 612	36	13	2.7	0.91	0.01	0.78	0.03	98.41	3.26	1.06	5111.0	NA	3718.8	98.4	4661.8	35.3										
NIST SRM 612	41	14	3.0	0.91	0.01	0.84	0.03	107.25	3.49	1.06	5124.0	NA	3942.5	101.1	4748.3	34.8										
NIST SRM 612	36	11	3.1	0.91	0.01	0.89	0.03	112.14	3.94	1.05	5116.0	NA	4091.9	111.1	4793.2	37.2										
91500 zircon	53	102	0.5	0.08	0.00	0.18	0.00	1.84	0.04	1.10	1087.0	NA	1045.2	20.3	1053.6	15.2										
91500 zircon	56	109	0.5	0.08	0.00	0.18	0.00	1.87	0.04	1.11	1097.0	NA	1056.7	20.3	1064.5	15.1										
91500 zircon	54	103	0.5	0.08	0.00	0.18	0.00	1.86	0.04	1.10	1086.0	NA	1057.5	20.5	1061.4	15.2										
NIST SRM 612	34	12	2.8	0.90	0.01	0.77	0.03	97.19	3.77	0.99	5109.6	5.7	3687.4	107.4	4646.4	38.6	2161.1	48.0	2161.1	36.6	2161.1	30.4	2161.1	48.0	0.0	(Ce.)
NIST SRM 612	38	13	3.0	0.91	0.01	0.83	0.03	105.92	4.06	0.99	5121.6	5.8	3909.7	110.7	4732.9	38.1	2231.4	46.4	2231.4	35.6	2231.4	29.6	2231.4	46.4	0.0	(Ce.)
NIST SRM 612	33	11	3.1	0.91	0.01	0.88	0.04	110.75	4.49	0.99	5114.0	5.8	4058.3	120.3	4777.7	40.3	2290.6	44.4	2290.6	37.8	2290.6	29.4	2290.6	44.4	0.0	(Ce.)
91500 zircon	49	95	0.5	0.07	0.00	0.17	0.00	1.81	0.05	0.95	1084.7	17.6	1034.5	25.3	1043.5	18.2	1032.3	18.2	1032.3	25.2	1032.3	18.1	1032.3	18.2	0.0	(Ce.)
91500 zircon	52	102	0.5	0.08	0.00	0.18	0.00	1.85	0.05	0.95	1094.3	17.0	1045.9	25.4	1054.4	18.2	1043.7	17.5	1043.7	25.3	1043.7	18.1	1043.7	17.5	0.0	(Ce.)
91500 zircon	51	96	0.5	0.07	0.00	0.18	0.00	1.84	0.05	0.95	1083.0	17.4	1046.7	25.5	1051.3	18.3	1045.0	17.9	1045.0	25.5	1045.0	18.2	1045.0	17.9	0.0	(Ce.)
ST20YSK1-40	241	476	0.5	0.05	0.00	0.01	0.00	0.07	0.00	0.81	219.1	41.2	67.9	1.7	71.4	2.2	67.6	45.2	67.6	1.7	67.6	2.1	67.6	1.7	0.0	(Ce.)

ST20YSK1-41	285	241	1.2	0.07	0.00	0.03	0.00	0.26	0.01	0.88	860.4	28.1	174.4	4.4	229.3	6.0	170.5	43.3	170.5	4.1	170.5	4.9	170.5	4.1	0.0	(Cc.)
ST20YSK1-42	771	735	1.0	0.05	0.00	0.01	0.00	0.07	0.00	0.85	217.4	35.0	62.4	1.5	65.8	1.9	62.2	38.4	62.2	1.5	62.2	1.8	62.2	1.5	0.0	(Cc.)
ST20YSK1-43	442	377	1.2	0.05	0.00	0.01	0.00	0.06	0.00	0.77	109.3	50.3	61.8	1.6	62.4	2.1	61.8	51.8	61.8	1.5	61.8	2.0	61.8	1.5	0.0	(Cc.)
ST20YSK1-44	154	198	0.8	0.10	0.00	0.01	0.00	0.14	0.00	0.81	1623.9	35.3	66.8	1.7	134.8	4.3	62.3	95.7	62.3	1.5	62.3	2.9	62.3	1.5	0.0	(Cc.)
ST20YSK1-45	245	247	1.0	0.05	0.00	0.01	0.00	0.06	0.00	0.70	65.3	62.2	62.7	1.6	62.1	2.3	62.7	62.3	62.7	1.6	62.7	2.2	62.7	1.6	0.0	(Cc.)
ST20YSK1-46	182	183	1.0	0.06	0.00	0.01	0.00	0.08	0.00	0.71	618.3	57.3	63.3	1.7	79.4	3.0	62.3	80.8	62.3	1.6	62.3	2.6	62.3	1.6	0.0	(Cc.)
ST20YSK1-47	681	870	0.8	0.06	0.00	0.01	0.00	0.08	0.00	0.89	556.6	27.8	64.9	1.6	79.1	2.1	64.0	37.8	64.0	1.6	64.0	1.8	64.0	1.6	0.0	(Cc.)
ST20YSK1-48	332	323	1.0	0.06	0.00	0.01	0.00	0.08	0.00	0.78	598.3	43.6	64.0	1.6	79.5	2.6	63.0	60.7	63.0	1.6	63.0	2.2	63.0	1.6	0.0	(Cc.)
ST20YSK1-49	272	398	0.7	0.05	0.00	0.01	0.00	0.07	0.00	0.78	159.1	46.9	64.6	1.6	66.5	2.1	64.5	49.7	64.5	1.6	64.5	2.0	64.5	1.6	0.0	(Cc.)
ST20YSK1-50	345	424	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.78	92.8	47.3	63.1	1.6	63.2	2.0	63.0	48.2	63.0	1.6	63.0	2.0	63.0	1.6	0.0	(Cc.)
ST20YSK1-51	40	79	0.5	0.16	0.00	0.01	0.00	0.27	0.01	0.81	2513.5	35.0	75.5	2.2	239.5	8.2	64.3	173.5	64.3	1.6	64.3	4.8	64.3	1.6	0.0	(Cc.)
ST20YSK1-52	382	171	2.2	0.05	0.00	0.03	0.00	0.19	0.01	0.81	151.8	43.2	178.6	4.5	174.9	5.2	178.7	42.5	178.7	4.6	178.7	5.2	178.7	4.6	0.0	(Cc.)
OD-3 zircon	899	491	1.8	0.05	0.00	0.01	0.00	0.03	0.00	0.70	0.0	61.9	33.0	0.8	32.0	1.2	33.0	61.3	33.0	0.8	33.0	1.2	33.0	0.8	0.0	(Cc.)
GJ-1 zircon	41	517	0.1	0.06	0.00	0.10	0.00	0.83	0.02	0.97	622.6	14.0	608.9	14.3	606.7	11.6	608.6	14.1	608.6	14.2	608.6	11.6	608.6	14.2	0.0	(Cc.)
NIST SRM 612	40	13	3.1	0.91	0.01	0.79	0.03	100.56	3.82	0.99	5121.2	5.8	3760.5	106.7	4680.6	37.8	2178.4	48.1	2178.4	35.4	2178.4	30.1	2178.4	48.1	0.0	(Cc.)
NIST SRM 612	36	12	3.0	0.90	0.01	0.89	0.03	111.86	4.38	0.99	5106.5	5.8	4104.4	117.1	4787.7	38.9	2313.8	43.5	2313.8	36.7	2313.8	28.8	2313.8	43.5	0.0	(Cc.)
NIST SRM 612	42	13	3.1	0.91	0.01	0.84	0.03	106.88	4.05	0.99	5121.8	5.8	3935.9	109.9	4741.9	37.7	2240.5	46.4	2240.5	35.2	2240.5	29.5	2240.5	46.4	0.0	(Cc.)
91500 zircon	53	101	0.5	0.07	0.00	0.18	0.00	1.87	0.05	0.95	1059.2	17.0	1074.6	26.0	1062.3	18.3	1075.3	16.9	1075.3	26.1	1075.3	18.4	1075.3	16.9	0.0	(Cc.)
91500 zircon	56	107	0.5	0.08	0.00	0.18	0.00	1.93	0.05	0.95	1095.8	16.4	1091.3	26.3	1085.5	18.3	1091.1	16.4	1091.1	26.3	1091.1	18.4	1091.1	16.4	0.0	(Cc.)
91500 zircon	53	99	0.5	0.07	0.00	0.18	0.00	1.91	0.05	0.95	1083.5	16.9	1085.0	26.3	1077.2	18.4	1085.1	16.9	1085.1	26.4	1085.1	18.5	1085.1	16.9	0.0	(Cc.)
NIST SRM 612	37	12	3.1	0.91	0.01	0.78	0.02	98.75	3.19	0.94	5117.7	15.0	3715.9	85.4	4665.1	30.8										
NIST SRM 612	33	11	3.0	0.90	0.01	0.88	0.03	109.84	3.69	0.95	5103.1	15.1	4056.8	95.3	4772.2	32.2										
NIST SRM 612	39	12	3.1	0.91	0.01	0.83	0.03	104.95	3.37	0.94	5118.3	15.0	3889.7	87.9	4726.4	30.7										
91500 zircon	49	93	0.5	0.07	0.00	0.18	0.00	1.83	0.04	0.73	1054.2	26.1	1059.1	13.7	1052.1	11.0	1059.4	26.0	1059.4	13.7	1059.4	12.6	1059.4	26.0	0.0	(Cc.)
91500 zircon	52	98	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.73	1090.9	25.6	1075.6	13.7	1075.2	10.9	1074.9	25.9	1074.9	13.7	1074.9	12.5	1074.9	25.9	0.0	(Cc.)
91500 zircon	49	91	0.5	0.07	0.00	0.18	0.00	1.88	0.04	0.74	1078.7	26.0	1069.4	13.9	1067.0	11.1	1068.9	26.2	1068.9	13.9	1068.9	12.7	1068.9	26.2	0.0	(Cc.)
ST20YSK1-53	237	183	1.3	0.09	0.00	0.03	0.00	0.34	0.01	0.61	1402.5	30.8	175.0	2.2	293.1	4.8	166.4	67.7	166.4	1.9	166.4	4.8	166.4	1.9	0.0	(Cc.)
ST20YSK1-54	118	169	0.7	0.05	0.00	0.01	0.00	0.07	0.00	0.42	222.9	70.5	62.9	0.9	66.7	2.2	62.7	77.8	62.7	0.9	62.7	2.2	62.7	0.9	0.0	(Cc.)
ST20YSK1-55	129	387	0.3	0.05	0.00	0.02	0.00	0.16	0.00	0.56	230.3	37.6	147.2	1.6	151.0	2.5	146.8	39.6	146.8	1.6	146.8	2.8	146.8	1.6	0.0	(Cc.)
ST20YSK1-56	66	132	0.5	0.05	0.00	0.01	0.00	0.07	0.00	0.40	176.4	81.2	61.4	0.9	63.9	2.4	61.3	87.1	61.3	1.0	61.3	2.4	61.3	1.0	0.0	(Cc.)
ST20YSK1-57	1228	956	1.3	0.05	0.00	0.01	0.00	0.08	0.00	0.55	341.5	34.8	71.6	0.7	79.4	1.2	71.0	41.1	71.0	0.7	71.0	1.4	71.0	0.7	0.0	(Cc.)

ST20YSK1-58	228	301	0.8	0.08	0.00	0.01	0.00	0.11	0.00	0.52	1111.3	39.6	66.4	0.8	104.5	2.2	63.9	76.5	63.9	0.8	63.9	2.1	63.9	0.8	0.0	(Cc.)
ST20YSK1-59	311	326	0.9	0.05	0.00	0.01	0.00	0.07	0.00	0.46	250.9	53.3	62.3	0.7	66.8	1.6	62.0	59.9	62.0	0.8	62.0	1.7	62.0	0.8	0.0	(Cc.)
ST20YSK1-60	421	633	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.50	115.5	43.8	62.4	0.7	63.3	1.2	62.3	45.3	62.3	0.6	62.3	1.3	62.3	0.6	0.0	(Cc.)
ST20YSK1-61	288	414	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.46	79.8	51.7	61.9	0.7	61.9	1.4	61.9	52.3	62.0	0.7	62.0	1.5	62.0	0.7	0.0	(Cc.)
NIST SRM 612	39	13	3.0	0.90	0.01	0.85	0.03	106.88	3.36	0.94	5107.4	15.1	3966.1	86.9	4744.7	29.9										
NIST SRM 612	36	13	2.8	0.91	0.01	0.80	0.02	101.72	3.21	0.94	5118.1	15.0	3799.6	84.7	4694.9	30.1										
NIST SRM 612	39	13	3.0	0.90	0.01	0.85	0.02	106.54	3.34	0.94	5107.1	15.1	3957.3	86.6	4741.5	29.9										
91500 zircon	57	106	0.5	0.07	0.00	0.18	0.00	1.84	0.03	0.73	1070.7	25.5	1054.0	13.1	1054.0	10.6	1053.2	25.8	1053.2	13.1	1053.2	12.2	1053.2	25.8	0.0	(Cc.)
91500 zircon	50	96	0.5	0.07	0.00	0.18	0.00	1.87	0.04	0.73	1080.9	25.8	1066.7	13.6	1065.8	10.9	1066.0	26.0	1066.0	13.6	1066.0	12.5	1066.0	26.0	0.0	(Cc.)
91500 zircon	56	106	0.5	0.08	0.00	0.18	0.00	1.89	0.03	0.73	1124.3	25.2	1053.5	13.1	1071.3	10.6	1050.2	26.5	1050.2	13.1	1050.2	12.3	1050.2	26.5	0.0	(Cc.)
NIST SRM 612	40	13	3.0	0.91	0.01	0.85	0.02	106.87	3.15	1.00	5107.4	2.8	3965.7	86.5	4748.9	30.1	2264.0	21.5	2264.0	27.8	2264.0	17.4	2264.0	21.5	0.0	(Cc.)
NIST SRM 612	37	13	2.8	0.92	0.01	0.80	0.02	101.70	3.01	1.00	5118.0	2.7	3799.2	84.3	4699.1	30.3	2195.1	22.3	2195.1	27.8	2195.1	17.7	2195.1	22.3	0.0	(Cc.)
NIST SRM 612	40	13	3.0	0.91	0.01	0.85	0.02	106.52	3.13	1.00	5107.0	2.8	3956.9	86.2	4745.7	30.1	2261.2	21.5	2261.2	27.7	2261.2	17.4	2261.2	21.5	0.0	(Cc.)
91500 zircon	58	108	0.5	0.07	0.00	0.18	0.00	1.84	0.03	0.88	1070.6	14.5	1053.8	12.8	1056.7	10.8	1053.1	14.6	1053.1	12.8	1053.1	9.9	1053.1	14.6	0.0	(Cc.)
91500 zircon	51	98	0.5	0.08	0.00	0.18	0.00	1.87	0.03	0.88	1080.7	15.0	1066.5	13.3	1068.6	11.2	1065.9	15.1	1065.9	13.3	1065.9	10.2	1065.9	15.1	0.0	(Cc.)
91500 zircon	58	108	0.5	0.08	0.00	0.18	0.00	1.89	0.03	0.88	1124.3	14.1	1053.3	12.8	1074.0	10.9	1050.1	14.8	1050.1	12.7	1050.1	9.9	1050.1	14.8	0.0	(Cc.)
ST20YSK1-62	313	364	0.9	0.05	0.00	0.01	0.00	0.06	0.00	0.48	79.2	48.7	62.2	0.7	62.4	1.5	62.1	49.2	62.1	0.7	62.1	1.4	62.1	0.7	0.0	(Cc.)
ST20YSK1-63	189	258	0.7	0.06	0.00	0.01	0.00	0.08	0.00	0.49	462.5	49.0	62.8	0.8	74.0	2.0	62.0	62.7	62.0	0.8	62.0	1.8	62.0	0.8	0.0	(Cc.)
ST20YSK1-64	251	326	0.8	0.05	0.00	0.01	0.00	0.07	0.00	0.49	143.7	48.9	65.4	0.8	67.3	1.7	65.3	51.3	65.3	0.8	65.3	1.6	65.3	0.8	0.0	(Cc.)
ST20YSK1-65	66	99	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.39	32.5	95.6	61.3	1.0	60.4	2.7	61.4	93.9	61.4	1.0	61.4	2.6	61.4	1.0	0.0	(Cc.)
ST20YSK1-66	817	677	1.2	0.25	0.00	0.01	0.00	0.46	0.01	0.89	3203.2	8.3	83.6	0.8	379.8	4.3	62.0	67.1	62.0	0.5	62.0	1.8	62.0	0.5	0.0	(Cc.)
ST20YSK1-67	19	60	0.3	0.05	0.00	0.02	0.00	0.17	0.01	0.49	158.7	72.7	156.9	2.7	156.4	5.5	156.8	72.8	156.8	2.7	156.8	5.2	156.8	2.7	0.0	(Cc.)
ST20YSK1-68	87	103	0.8	0.06	0.00	0.04	0.00	0.32	0.01	0.64	673.6	36.6	235.3	3.3	279.2	5.9	232.1	48.2	232.1	3.1	232.1	5.2	232.1	3.1	0.0	(Cc.)
ST20YSK1-69	199	250	0.8	0.05	0.00	0.01	0.00	0.07	0.00	0.46	27.6	57.5	67.8	0.8	66.4	1.9	67.9	56.1	68.0	0.8	68.0	1.8	68.0	0.8	0.0	(Cc.)
ST20YSK1-70	130	254	0.5	0.06	0.00	0.03	0.00	0.24	0.00	0.66	484.1	28.0	194.6	2.2	217.6	3.7	192.9	33.5	192.9	2.2	192.9	3.2	192.9	2.2	0.0	(Cc.)
ST20YSK1-71	682	858	0.8	0.07	0.00	0.01	0.00	0.10	0.00	0.69	1026.4	21.2	65.5	0.6	99.5	1.6	63.3	38.8	63.3	0.6	63.3	1.2	63.3	0.6	0.0	(Cc.)
ST20YSK1-72	493	654	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.56	83.1	36.2	63.1	0.6	63.4	1.2	63.1	36.7	63.1	0.6	63.1	1.1	63.1	0.6	0.0	(Cc.)
ST20YSK1-73	327	333	1.0	0.05	0.00	0.01	0.00	0.06	0.00	0.48	117.5	50.2	61.9	0.7	63.1	1.6	61.8	51.9	61.8	0.7	61.8	1.5	61.8	0.7	0.0	(Cc.)
ST20YSK1-74	164	154	1.1	0.05	0.00	0.01	0.00	0.07	0.00	0.42	136.9	72.7	62.9	0.9	64.6	2.3	62.8	76.1	62.8	0.9	62.8	2.1	62.8	0.9	0.0	(Cc.)
OD-3 zircon	797	517	1.5	0.05	0.00	0.01	0.00	0.03	0.00	0.43	15.2	58.0	32.4	0.4	32.1	0.9	32.4	57.4	32.4	0.4	32.4	0.9	32.4	0.4	0.0	(Cc.)
GJ-1 zircon	38	497	0.1	0.06	0.00	0.10	0.00	0.79	0.01	0.88	611.5	11.7	588.1	5.5	591.2	5.8	587.7	11.8	587.7	5.5	587.7	5.0	587.7	5.5	0.0	(Cc.)

NIST SRM 612	35	12	2.9	0.90	0.01	0.85	0.03	105.97	3.28	1.00	5097.6	2.8	3961.3	90.8	4740.4	31.6	2271.3	21.3	2271.3	29.4	2271.3	17.9	2271.3	21.3	0.0	(Cc.)
NIST SRM 612	36	12	3.1	0.91	0.01	0.85	0.03	106.66	3.31	1.00	5112.6	2.7	3949.2	90.8	4747.0	31.6	2253.4	21.2	2253.4	29.1	2253.4	17.8	2253.4	21.2	0.0	(Cc.)
NIST SRM 612	35	11	3.2	0.90	0.01	0.91	0.03	112.69	3.60	1.00	5092.4	2.8	4157.4	96.9	4802.3	32.5	2346.0	20.2	2346.0	30.4	2346.0	17.8	2346.0	20.2	0.0	(Cc.)
91500 zircon	52	97	0.5	0.07	0.00	0.18	0.00	1.88	0.03	0.88	1069.4	15.0	1075.4	13.5	1070.8	11.2	1075.7	15.0	1075.7	13.5	1075.7	10.3	1075.7	15.0	0.0	(Cc.)
91500 zircon	56	105	0.5	0.08	0.00	0.18	0.00	1.87	0.03	0.88	1084.0	14.5	1062.4	13.0	1066.9	11.0	1061.4	14.7	1061.4	13.0	1061.4	10.0	1061.4	14.7	0.0	(Cc.)
91500 zircon	50	101	0.5	0.07	0.00	0.18	0.00	1.86	0.03	0.88	1071.4	14.8	1066.7	13.2	1065.6	11.1	1066.5	14.9	1066.5	13.3	1066.5	10.2	1066.5	14.9	0.0	(Cc.)
NIST SRM 612	35	12	2.9	0.90	0.01	0.85	0.03	106.40	3.34	1.05	5099.0	NA	3971.3	97.0	4743.1	33.8										
NIST SRM 612	37	12	3.0	0.91	0.01	0.85	0.03	107.10	3.36	1.05	5114.0	NA	3959.1	97.0	4749.6	33.9										
NIST SRM 612	35	11	3.1	0.90	0.01	0.91	0.03	113.14	3.66	1.05	5093.0	NA	4167.7	103.2	4804.9	34.7										
91500 zircon	53	98	0.5	0.07	0.00	0.18	0.00	1.89	0.03	1.09	1071.0	NA	1078.8	17.7	1072.6	13.9										
91500 zircon	57	107	0.5	0.08	0.00	0.18	0.00	1.87	0.03	1.10	1085.0	NA	1065.7	17.3	1068.6	13.6										
91500 zircon	51	102	0.5	0.07	0.00	0.18	0.00	1.87	0.03	1.10	1073.0	NA	1070.0	17.5	1067.4	13.7										
ST20YSK1-75	129	142	0.9	0.07	0.00	0.01	0.00	0.10	0.00	0.61	933.0	50.1	63.5	1.2	92.3	3.1	61.6	86.4	61.6	1.1	61.6	2.4	61.6	1.1	0.0	(Cc.)
ST20YSK1-76	179	245	0.7	0.08	0.00	0.01	0.00	0.11	0.00	0.74	1214.0	30.0	66.2	1.1	109.8	2.9	63.4	61.9	63.4	1.1	63.4	1.9	63.4	1.1	0.0	(Cc.)
ST20YSK1-77	233	357	0.6	0.08	0.00	0.01	0.00	0.11	0.00	0.82	1209.3	22.7	64.4	1.0	106.7	2.5	61.7	46.8	61.7	0.9	61.7	1.5	61.7	0.9	0.0	(Cc.)
ST20YSK1-78	552	799	0.7	0.05	0.00	0.01	0.00	0.07	0.00	0.88	324.4	18.9	62.3	0.9	69.1	1.5	61.9	22.2	61.9	0.9	61.9	1.1	61.9	0.9	0.0	(Cc.)
ST20YSK1-79	206	261	0.8	0.05	0.00	0.01	0.00	0.07	0.00	0.62	193.9	49.1	63.4	1.1	66.5	2.0	63.2	53.2	63.2	1.1	63.2	1.7	63.2	1.1	0.0	(Cc.)
ST20YSK1-80	294	438	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.71	107.2	37.0	61.9	1.0	62.7	1.6	61.8	38.1	61.8	1.0	61.8	1.4	61.8	1.0	0.0	(Cc.)
ST20YSK1-81	232	395	0.6	0.05	0.00	0.01	0.00	0.07	0.00	0.72	216.0	35.6	66.9	1.1	70.8	1.8	66.6	39.0	66.6	1.1	66.6	1.5	66.6	1.1	0.0	(Cc.)
ST20YSK1-82	233	224	1.0	0.05	0.00	0.01	0.00	0.07	0.00	0.60	241.0	53.9	61.5	1.1	65.9	2.1	61.2	60.2	61.2	1.1	61.2	1.8	<u>61.2*</u>	<u>1.1*</u>	0.0	(Cc.)
ST20YSK1-83	330	328	1.0	0.05	0.00	0.01	0.00	0.07	0.00	0.66	76.9	44.5	64.1	1.0	64.1	1.8	64.1	44.9	64.1	1.0	64.1	1.6	64.1	1.0	0.0	(Cc.)
ST20YSK1-84	2135	865	2.4	0.07	0.00	0.02	0.00	0.23	0.00	1.15	1042.0	NA	142.4	2.1	207.5	3.5										
ST20YSK1-85	127	106	1.2	0.06	0.00	0.03	0.00	0.25	0.01	0.76	754.4	33.5	181.8	3.3	228.7	5.8	178.5	48.0	178.5	3.1	178.5	4.5	178.5	3.1	0.0	(Cc.)
ST20YSK1-86	252	332	0.7	0.04	0.00	0.01	0.00	0.06	0.00	0.64	0.0	46.4	61.6	1.0	58.5	1.7	61.7	45.2	61.7	1.0	61.7	1.5	61.7	1.0	0.0	(Cc.)
ST10YSK1-87	553	370	1.5	0.05	0.00	0.05	0.00	0.37	0.01	1.07	368.0	NA	313.8	4.8	318.9	5.4										
OD-3 zircon	520	372	1.4	0.05	0.00	0.00	0.00	0.03	0.00	0.54	62.0	63.7	31.8	0.5	32.1	1.1	31.8	64.8	31.8	0.5	31.8	1.0	31.8	0.5	0.0	(Cc.)
GJ-1 zircon	33	470	0.1	0.06	0.00	0.10	0.00	0.83	0.01	1.23	652.0	NA	600.0	8.7	608.6	8.2										
NIST SRM 612	42	14	2.9	0.91	0.01	0.83	0.03	105.77	3.08	1.06	5118.0	NA	3912.5	89.9	4737.2	31.8										
NIST SRM 612	35	12	2.9	0.92	0.01	0.88	0.03	111.34	3.49	1.05	5121.0	NA	4059.9	98.7	4788.7	33.9										
NIST SRM 612	39	13	3.0	0.90	0.01	0.83	0.03	104.05	3.17	1.05	5102.0	NA	3897.9	93.3	4720.7	33.0										
91500 zircon	55	106	0.5	0.08	0.00	0.18	0.00	1.88	0.03	1.10	1108.0	NA	1055.5	17.1	1069.2	13.6										

91500 zircon	55	106	0.5	0.07	0.00	0.18	0.00	1.87	0.03	1.10	1070.0	NA	1069.6	17.4	1066.3	13.6										
91500 zircon	51	94	0.5	0.08	0.00	0.17	0.00	1.83	0.03	1.08	1094.0	NA	1038.6	17.3	1053.0	13.9										
NIST SRM 612	40	13	3.0	0.91	0.01	0.84	0.03	106.29	3.37	0.97	5115.1	10.0	3933.5	90.3	4743.4	31.4	5097.6	10.2	5098.0	156.0	5097.6	45.3	5097.6	10.2	0.0	(Cc.)
NIST SRM 612	34	11	2.9	0.91	0.01	0.88	0.03	111.88	3.78	0.98	5117.5	10.0	4081.5	99.2	4795.0	33.5	5100.5	10.2	5100.0	159.0	5100.5	46.1	5100.5	10.2	0.0	(Cc.)
NIST SRM 612	38	12	3.1	0.90	0.01	0.84	0.03	104.56	3.44	0.98	5099.0	10.1	3918.8	93.8	4726.9	32.6	5088.9	10.1	5089.0	163.0	5088.9	47.2	5088.9	10.1	0.0	(Cc.)
91500 zircon	53	102	0.5	0.08	0.00	0.18	0.00	1.89	0.04	0.87	1103.4	19.9	1062.5	17.3	1073.3	13.2	1060.6	20.5	1060.6	17.3	1060.6	13.4	1060.6	20.5	0.0	(Cc.)
91500 zircon	53	101	0.5	0.07	0.00	0.18	0.00	1.88	0.04	0.87	1065.9	20.1	1076.6	17.5	1070.4	13.2	1077.1	19.9	1077.1	17.6	1077.1	13.5	1077.1	19.9	0.0	(Cc.)
91500 zircon	49	90	0.5	0.08	0.00	0.18	0.00	1.84	0.04	0.87	1089.2	20.7	1045.5	17.4	1057.1	13.5	1043.6	21.3	1043.6	17.4	1043.6	13.6	1043.6	21.3	0.0	(Cc.)
ST20YSK1-88	142	169	0.8	0.17	0.00	0.01	0.00	0.28	0.01	0.77	2602.2	24.4	75.5	1.3	252.6	5.5	63.4	128.8	63.4	0.9	63.4	3.5	63.4	0.9	0.0	(Cc.)
ST20YSK1-89	177	251	0.7	0.06	0.00	0.01	0.00	0.09	0.00	0.61	688.1	47.1	63.4	1.1	82.6	2.3	62.2	69.4	62.2	1.0	62.2	2.0	62.2	1.0	0.0	(Cc.)
ST20YSK1-90	457	467	1.0	0.05	0.00	0.01	0.00	0.07	0.00	0.66	315.2	41.2	63.9	1.0	70.7	1.7	63.5	48.0	63.5	1.0	63.5	1.6	63.5	1.0	0.0	(Cc.)
ST20YSK1-91	144	283	0.5	0.05	0.00	0.01	0.00	0.07	0.00	0.58	73.1	55.1	67.6	1.1	67.5	1.9	67.6	55.3	67.6	1.2	67.6	1.9	67.6	1.2	0.0	(Cc.)
ST20YSK1-92	91	136	0.7	0.05	0.00	0.01	0.00	0.07	0.00	0.49	122.2	78.4	63.5	1.2	64.8	2.5	63.4	81.3	63.4	1.2	63.4	2.4	63.4	1.2	0.0	(Cc.)
ST20YSK1-93	412	756	0.5	0.05	0.00	0.01	0.00	0.07	0.00	0.70	109.3	36.6	63.3	1.0	64.3	1.4	63.2	37.7	63.2	1.0	63.2	1.4	63.2	1.0	0.0	(Cc.)
ST20YSK1-94	276	342	0.8	0.05	0.00	0.01	0.00	0.07	0.00	0.60	206.9	50.1	61.8	1.0	65.3	1.8	61.5	54.8	61.6	1.0	61.6	1.7	61.6	1.0	0.0	(Cc.)
ST20YSK1-95	94	108	0.9	0.10	0.00	0.01	0.00	0.14	0.00	0.62	1542.7	46.8	69.8	1.4	135.9	4.3	65.6	120.0	65.6	1.2	65.6	3.4	65.6	1.2	0.0	(Cc.)
ST20YSK1-96	488	672	0.7	0.05	0.00	0.01	0.00	0.07	0.00	0.69	123.7	38.2	63.8	1.0	65.1	1.4	63.7	39.6	63.7	1.0	63.7	1.4	63.7	1.0	0.0	(Cc.)
ST20YSK1-97	267	274	1.0	0.06	0.00	0.01	0.00	0.09	0.00	0.63	725.8	43.9	65.6	1.1	86.9	2.3	64.3	66.3	64.3	1.0	64.3	2.0	64.3	1.0	0.0	(Cc.)
ST20YSK1-98	356	403	0.9	0.06	0.00	0.01	0.00	0.08	0.00	0.65	473.4	41.0	64.8	1.0	76.7	1.9	64.0	52.8	64.0	1.0	64.0	1.7	64.0	1.0	0.0	(Cc.)
ST20YSK1-99	208	262	0.8	0.10	0.00	0.02	0.00	0.23	0.00	0.76	1590.0	26.4	107.1	1.7	206.8	4.1	100.4	68.3	100.4	1.5	100.4	3.1	100.4	1.5	0.0	(Cc.)
ST20YSK1-100	149	159	0.9	0.04	0.00	0.01	0.00	0.06	0.00	0.50	0.0	73.1	65.7	1.2	62.1	2.3	65.7	71.0	65.7	1.2	65.7	2.2	65.7	1.2	0.0	(Cc.)
OD-3 zircon	684	487	1.4	0.05	0.00	0.01	0.00	0.03	0.00	0.55	95.1	59.2	33.2	0.5	33.9	1.0	33.1	61.5	33.1	0.5	33.1	1.0	33.1	0.5	0.0	(Cc.)
GJ-1 zircon	34	463	0.1	0.06	0.00	0.10	0.00	0.82	0.01	0.87	621.0	18.8	601.6	8.8	603.9	7.8	601.2	19.1	601.2	8.8	601.2	8.0	601.2	8.8	0.0	(Cc.)
NIST SRM 612	37	13	2.8	0.91	0.01	0.82	0.03	102.98	3.29	0.97	5103.0	10.0	3866.1	90.0	4711.6	31.7	5090.7	10.1	5091.0	161.0	5090.7	46.6	5090.7	10.1	0.0	(Cc.)
NIST SRM 612	37	12	3.1	0.90	0.01	0.89	0.03	110.93	3.71	0.98	5101.5	10.0	4089.9	98.4	4786.4	33.2	5091.4	10.1	5091.0	156.0	5091.4	45.4	5091.4	10.1	0.0	(Cc.)
NIST SRM 612	38	12	3.2	0.90	0.01	0.88	0.03	110.13	3.68	0.98	5099.0	10.0	4073.3	97.7	4779.2	33.1	5089.9	10.1	5090.0	157.0	5089.9	45.5	5089.9	10.1	0.0	(Cc.)
91500 zircon	49	91	0.5	0.08	0.00	0.18	0.00	1.91	0.04	0.87	1086.1	20.5	1081.8	17.9	1080.5	13.6	1081.6	20.5	1081.6	18.0	1081.6	13.8	1081.6	20.5	0.0	(Cc.)
91500 zircon	50	94	0.5	0.07	0.00	0.18	0.00	1.82	0.04	0.87	1062.6	20.6	1050.2	17.4	1051.6	13.3	1049.7	20.8	1049.7	17.3	1049.7	13.5	1049.7	20.8	0.0	(Cc.)
91500 zircon	47	87	0.5	0.08	0.00	0.18	0.00	1.87	0.04	0.87	1093.1	20.7	1061.5	17.8	1069.3	13.6	1060.1	21.2	1060.1	17.7	1060.1	13.8	1060.1	21.2	0.0	(Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 94
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age})/(^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

C.3 Mukaiengaru Unit (ST24MG2)

U-Pb LA-ICP-MS Detrital Zircon Data of Mukaiengaru Unit
Sample Location: Station-24, Engaru Area, Eastern Hokkaido, Japan
Unit / Group: Mukaiengaru Unit / Yubetsu Group
Belt: Tokoro Belt
Sample Type: Sandstone

Grain Number	Th (PPM)	U (PPM)	Th/ U	Isotopic Ratios							U-Pb Age (Ma)												Preferr ed Age	± 1σ	Disc. (%)	
											before Stacey-Kramers Correction						after Stacey-Kramers Correction									
				207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ	207Pb/ 235U	± 1σ	Error Corr.	207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ	207Pb/ 235U	± 1σ	207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ	207Pb/ 235U	± 1σ				
ST24MG2-1	232	222	1.0	0.11	0.00	0.33	0.00	5.19	0.07	1.01	1893.0	NA	1814.8	21.5	1845.2	12.5										
ST24MG2-2	329	326	1.0	0.08	0.00	0.01	0.00	0.09	0.00	0.62	1127.8	36.2	56.0	0.8	89.6	2.2	53.9	71.1	53.9	0.8	53.9	1.7	53.9	0.8	0.0	(Cc.)
ST24MG2-3	153	228	0.7	0.09	0.00	0.01	0.00	0.11	0.00	0.62	1358.0	37.5	61.2	0.9	109.1	2.8	58.2	85.4	58.2	0.9	58.2	2.2	58.2	0.9	0.0	(Cc.)
ST24MG2-4	561	594	0.9	0.05	0.00	0.01	0.00	0.07	0.00	0.64	159.3	37.0	65.4	0.8	67.5	1.4	65.3	39.2	65.3	0.8	65.3	1.3	65.3	0.8	0.0	(Cc.)
ST24MG2-5	169	213	0.8	0.06	0.00	0.01	0.00	0.07	0.00	0.50	537.7	58.9	54.2	0.8	66.1	2.1	53.4	79.4	53.4	0.8	53.4	1.9	53.4	0.8	0.0	(Cc.)
ST24MG2-6	451	732	0.6	0.05	0.00	0.01	0.00	0.08	0.00	0.70	17.6	30.6	84.8	1.1	82.0	1.5	85.6	29.4	85.6	1.1	85.6	1.5	85.6	1.1	0.0	(Cc.)
ST24MG2-7	37	40	0.9	0.11	0.00	0.32	0.01	4.95	0.11	0.96	1850.2	11.2	1776.3	31.6	1804.1	18.8	1767.3	11.8	1767.3	31.3	1767.3	17.8	1767.3	11.8	0.0	(Cc.)
ST24MG2-8	291	362	0.8	0.05	0.00	0.01	0.00	0.10	0.00	0.64	263.3	37.9	94.0	1.3	100.0	2.2	93.5	42.1	93.5	1.3	93.5	2.0	93.5	1.3	0.0	(Cc.)
ST24MG2-9	113	161	0.7	0.05	0.00	0.01	0.00	0.08	0.00	0.49	112.7	67.7	76.7	1.2	77.3	2.6	76.7	69.2	76.7	1.2	76.7	2.5	76.7	1.2	0.0	(Cc.)
ST24MG2-10	579	662	0.9	0.05	0.00	0.01	0.00	0.06	0.00	0.61	47.5	40.0	55.2	0.7	54.6	1.2	55.2	39.8	55.2	0.7	55.2	1.1	55.2	0.7	0.0	(Cc.)
ST24MG2-11	487	633	0.8	0.08	0.00	0.01	0.00	0.12	0.00	0.76	1307.0	21.5	66.2	0.9	114.6	2.0	63.1	47.2	63.1	0.8	63.1	1.4	63.1	0.8	0.0	(Cc.)
ST24MG2-12	356	381	0.9	0.07	0.00	0.01	0.00	0.13	0.00	0.70	900.2	28.9	89.5	1.2	125.9	2.5	87.0	48.0	87.1	1.1	87.1	2.0	87.1	1.1	0.0	(Cc.)
ST24MG2-13	236	360	0.6	0.05	0.00	0.01	0.00	0.09	0.00	0.61	82.2	42.6	87.4	1.2	86.6	2.0	87.4	42.4	87.4	1.2	87.4	1.9	87.4	1.2	0.0	(Cc.)
OD-3 zircon	712	491	1.4	0.05	0.00	0.01	0.00	0.03	0.00	0.49	180.1	57.8	32.6	0.5	34.4	1.0	32.5	63.2	32.5	0.5	32.5	1.0	32.5	0.5	0.0	(Cc.)
NIST SRM 612	38	12	3.1	0.91	0.01	0.86	0.03	107.90	3.49	1.01	5110.0	NA	3988.1	96.2	4755.0	32.9										
NIST SRM 612	40	14	2.9	0.91	0.01	0.87	0.03	110.58	3.40	1.01	5120.0	NA	4040.4	92.1	4779.6	31.2										
NIST SRM 612	35	12	2.9	0.91	0.01	0.84	0.03	106.24	3.46	1.01	5113.0	NA	3936.1	95.8	4739.4	33.1										
91500 zircon	46	98	0.5	0.08	0.00	0.18	0.00	1.86	0.03	0.92	1111.0	13.5	1046.4	15.3	1062.5	12.1	1043.5	14.1	1043.5	15.3	1043.5	11.3	1043.5	14.1	0.0	(Cc.)
91500 zircon	52	100	0.5	0.08	0.00	0.18	0.00	1.86	0.03	0.92	1086.7	13.4	1058.9	15.4	1063.0	12.1	1057.7	13.6	1057.7	15.4	1057.7	11.3	1057.7	13.6	0.0	(Cc.)
91500 zircon	46	93	0.5	0.07	0.00	0.18	0.00	1.87	0.03	0.92	1082.8	14.0	1062.0	15.7	1063.8	12.3	1061.1	14.2	1061.1	15.7	1061.1	11.6	1061.1	14.2	0.0	(Cc.)
NIST SRM 612	39	12	3.2	0.90	0.01	0.86	0.03	107.83	3.77	0.97	5105.8	12.9	3995.7	99.9	4754.9	33.9	5093.1	13.0	5093.0	167.0	5093.1	48.7	5093.1	13.0	0.0	(Cc.)

NIST SRM 612	42	14	3.0	0.91	0.01	0.87	0.03	110.50	3.70	0.96	5115.7	12.9	4048.0	96.1	4779.5	32.4	5099.1	13.0	5099.0	157.0	5099.1	45.8	5099.1	13.0	0.0	(Cc.)
NIST SRM 612	36	12	3.0	0.91	0.01	0.84	0.03	106.17	3.74	0.97	5108.7	12.9	3943.6	99.5	4739.2	34.1	5094.2	13.0	5094.0	171.0	5094.2	49.8	5094.2	13.0	0.0	(Cc.)
91500 zircon	48	99	0.5	0.08	0.00	0.18	0.00	1.86	0.04	0.84	1104.6	23.7	1048.9	17.6	1062.5	13.4	1046.3	24.7	1046.3	17.6	1046.3	14.3	1046.3	24.7	0.0	(Cc.)
91500 zircon	54	101	0.5	0.07	0.00	0.18	0.00	1.86	0.04	0.84	1080.3	23.8	1061.4	17.8	1063.0	13.3	1060.5	24.1	1060.5	17.8	1060.5	14.3	1060.5	24.1	0.0	(Cc.)
91500 zircon	47	94	0.5	0.07	0.00	0.18	0.00	1.86	0.04	0.84	1076.4	24.1	1064.5	18.1	1063.7	13.5	1063.9	24.3	1063.9	18.1	1063.9	14.5	1063.9	24.3	0.0	(Cc.)
GJ-1 zircon	32	449	0.1	0.06	0.00	0.10	0.00	0.80	0.02	0.82	628.4	23.0	590.8	8.8	595.5	7.7	590.1	23.6	590.1	8.7	590.1	8.5	590.1	8.7	0.0	(Cc.)
ST24MG2-14	261	251	1.0	0.05	0.00	0.01	0.00	0.06	0.00	0.52	182.9	67.7	53.4	0.9	56.0	1.9	53.2	73.2	53.2	1.0	53.2	1.8	53.2	1.0	0.0	(Cc.)
ST24MG2-15	216	162	1.3	0.06	0.00	0.02	0.00	0.18	0.01	0.64	429.6	47.2	152.2	2.7	169.2	4.2	151.0	56.0	151.0	2.6	151.0	4.2	151.0	2.6	0.0	(Cc.)
ST24MG2-16	160	187	0.8	0.05	0.00	0.01	0.00	0.07	0.00	0.51	235.2	71.4	60.7	1.1	64.9	2.3	60.5	79.5	60.5	1.1	60.5	2.2	60.5	1.1	0.0	(Cc.)
ST24MG2-17	578	452	1.3	0.05	0.00	0.01	0.00	0.06	0.00	0.60	229.2	50.9	55.1	0.9	58.9	1.6	54.9	56.6	54.9	0.9	54.9	1.5	54.9	0.9	0.0	(Cc.)
ST24MG2-18	48	52	0.9	0.05	0.00	0.03	0.00	0.19	0.01	0.56	412.9	75.6	163.3	3.6	179.4	6.8	162.1	88.2	162.1	3.6	162.1	6.6	162.1	3.6	0.0	(Cc.)
ST24MG2-19	455	639	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.63	156.6	45.8	54.1	0.9	56.0	1.3	53.9	48.8	53.9	0.8	53.9	1.4	53.9	0.8	0.0	(Cc.)
ST24MG2-20	346	220	1.6	0.06	0.00	0.06	0.00	0.52	0.01	0.78	567.3	29.0	400.7	6.4	423.9	6.9	398.6	32.3	398.6	6.4	398.6	7.2	398.6	6.4	0.0	(Cc.)
ST24MG2-21	207	271	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.53	225.3	63.6	54.3	0.9	57.8	1.9	54.0	70.6	54.0	1.0	54.0	1.8	54.0	1.0	0.0	(Cc.)
ST24MG2-22	79	269	0.3	0.05	0.00	0.03	0.00	0.19	0.00	0.69	213.5	39.7	175.7	2.9	177.2	3.7	175.5	40.6	175.5	2.8	175.5	3.9	175.5	2.8	0.0	(Cc.)
ST24MG2-23	880	574	1.5	0.05	0.00	0.01	0.00	0.06	0.00	0.61	71.2	49.1	54.8	0.9	54.8	1.4	54.7	49.6	54.7	0.9	54.7	1.4	54.7	0.9	0.0	(Cc.)
ST24MG2-24	187	254	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.53	260.1	65.0	53.5	0.9	57.9	1.9	53.2	73.8	53.3	1.0	53.3	1.8	53.3	1.0	0.0	(Cc.)
ST24MG2-25	561	645	0.9	0.05	0.00	0.01	0.00	0.06	0.00	0.64	210.2	44.4	55.0	0.9	58.3	1.4	54.8	48.9	54.8	0.9	54.8	1.4	54.8	0.9	0.0	(Cc.)
ST24MG2-26	832	626	1.3	0.05	0.00	0.01	0.00	0.08	0.00	0.67	157.2	40.7	75.7	1.2	77.7	1.7	75.5	42.8	75.5	1.2	75.5	1.7	75.5	1.2	0.0	(Cc.)
OD-3 zircon	1673	891	1.9	0.05	0.00	0.01	0.00	0.03	0.00	0.59	0.0	51.1	33.1	0.5	32.2	0.8	33.1	50.6	33.1	0.5	33.1	0.9	33.1	0.5	0.0	(Cc.)
NIST SRM 612	34	12	2.7	0.91	0.01	0.84	0.03	106.05	3.71	0.97	5118.6	12.9	3919.5	98.4	4738.1	33.9	5099.2	13.0	5099.0	171.0	5099.2	49.9	5099.2	13.0	0.0	(Cc.)
NIST SRM 612	38	13	3.0	0.90	0.01	0.87	0.03	109.56	3.77	0.96	5105.7	12.9	4043.5	99.0	4770.9	33.4	5093.5	13.0	5093.0	161.0	5093.5	47.2	5093.5	13.0	0.0	(Cc.)
NIST SRM 612	35	11	3.1	0.90	0.01	0.85	0.03	106.69	3.87	0.97	5106.5	12.9	3962.7	103.2	4744.2	35.3	5093.2	13.0	5093.0	175.0	5093.2	51.1	5093.2	13.0	0.0	(Cc.)
91500 zircon	45	93	0.5	0.07	0.00	0.18	0.00	1.82	0.04	0.84	1056.2	24.4	1048.7	17.9	1046.5	13.5	1048.4	24.5	1048.4	17.9	1048.4	14.5	1048.4	24.5	0.0	(Cc.)
91500 zircon	49	93	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.84	1112.9	23.9	1067.2	18.2	1077.6	13.7	1065.1	24.7	1065.1	18.1	1065.1	14.6	1065.1	24.7	0.0	(Cc.)
91500 zircon	49	98	0.5	0.07	0.00	0.18	0.00	1.90	0.04	0.84	1069.6	23.8	1087.6	18.3	1076.9	13.5	1088.4	23.5	1088.4	18.3	1088.4	14.5	1088.4	23.5	0.0	(Cc.)
NIST SRM 612	36	13	2.8	0.91	0.01	0.83	0.03	105.59	3.80	0.91	5121.3	20.6	3901.3	95.7	4728.3	33.4										
NIST SRM 612	40	13	3.0	0.90	0.01	0.87	0.03	109.09	3.88	0.91	5108.4	20.6	4024.9	96.3	4761.1	32.8										
NIST SRM 612	37	11	3.2	0.90	0.01	0.84	0.03	106.23	3.97	0.92	5109.1	20.6	3944.4	100.6	4734.4	34.7										
91500 zircon	48	96	0.5	0.07	0.00	0.18	0.00	1.81	0.04	0.71	1060.0	33.5	1042.7	16.3	1040.2	12.9	1041.9	33.9	1041.9	16.3	1041.9	15.5	1041.9	33.9	0.0	(Cc.)
91500 zircon	52	96	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.72	1116.7	33.0	1061.1	16.6	1071.2	13.0	1058.5	34.3	1058.5	16.5	1058.5	15.8	1058.5	34.3	0.0	(Cc.)
91500 zircon	52	101	0.5	0.07	0.00	0.18	0.00	1.89	0.04	0.71	1073.2	33.0	1081.4	16.6	1070.4	12.8	1081.8	32.8	1081.8	16.6	1081.8	15.6	1081.8	32.8	0.0	(Cc.)

GJ-1 zircon	30	439	0.1	0.06	0.00	0.10	0.00	0.81	0.02	0.66	628.6	33.7	593.9	7.8	595.6	7.2	593.2	34.5	593.2	7.8	593.2	9.4	593.2	7.8	0.0	(Cc.)
ST24MG2-27	359	455	0.8	0.05	0.00	0.01	0.00	0.09	0.00	0.54	129.6	52.3	83.5	1.2	84.1	1.9	83.4	53.8	83.4	1.2	83.4	2.1	83.4	1.2	0.0	(Cc.)
ST24MG2-28	277	271	1.0	0.05	0.00	0.01	0.00	0.07	0.00	0.48	45.7	67.2	70.4	1.1	68.9	2.0	70.5	66.2	70.5	1.1	70.5	2.2	70.5	1.1	0.0	(Cc.)
ST24MG2-29	481	621	0.8	0.04	0.00	0.01	0.00	0.05	0.00	0.51	0.0	53.7	54.1	0.8	49.4	1.2	54.1	52.5	54.1	0.8	54.1	1.4	54.1	0.8	0.0	(Cc.)
ST24MG2-30	251	294	0.8	0.06	0.00	0.01	0.00	0.07	0.00	0.50	569.1	59.4	55.4	0.9	68.2	2.0	54.6	81.6	54.6	0.8	54.6	2.0	54.6	0.8	0.0	(Cc.)
ST24MG2-31	425	456	0.9	0.05	0.00	0.01	0.00	0.08	0.00	0.54	126.4	52.8	80.2	1.1	80.8	1.8	80.1	54.3	80.1	1.1	80.1	2.1	80.1	1.1	0.0	(Cc.)
ST24MG2-32	1557	933	1.7	0.05	0.00	0.01	0.00	0.08	0.00	0.58	436.9	42.5	66.3	0.9	76.6	1.5	65.7	53.4	65.7	0.9	65.7	1.7	65.7	0.9	0.0	(Cc.)
ST24MG2-33	2571	1768	1.4	0.06	0.00	0.01	0.00	0.08	0.00	0.61	797.7	36.0	54.6	0.7	74.5	1.2	53.3	57.3	53.3	0.7	53.3	1.4	53.3	0.7	0.0	(Cc.)
ST24MG2-34	151	184	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.45	339.8	77.6	55.0	0.9	61.2	2.2	54.6	92.4	54.6	0.9	54.6	2.3	54.6	0.9	0.0	(Cc.)
ST24MG2-35	431	430	1.0	0.05	0.00	0.01	0.00	0.06	0.00	0.49	76.5	62.0	54.3	0.8	54.1	1.5	54.2	62.9	54.2	0.8	54.2	1.6	54.2	0.8	0.0	(Cc.)
ST24MG2-36	628	550	1.1	0.05	0.00	0.01	0.00	0.07	0.00	0.54	163.6	52.2	67.0	0.9	68.9	1.6	66.8	55.4	66.9	1.0	66.9	1.8	66.9	1.0	0.0	(Cc.)
ST24MG2-37	516	980	0.5	0.05	0.00	0.01	0.00	0.07	0.00	0.57	40.3	46.5	69.6	0.9	67.9	1.3	69.7	45.7	69.7	1.0	69.7	1.6	69.7	1.0	0.0	(Cc.)
ST24MG2-38	275	204	1.3	0.05	0.00	0.01	0.00	0.09	0.00	0.49	27.8	68.1	92.1	1.5	88.7	2.6	92.6	65.5	92.6	1.5	92.6	2.8	92.6	1.5	0.0	(Cc.)
ST24MG2-39	413	700	0.6	0.04	0.00	0.01	0.00	0.05	0.00	0.52	0.0	53.5	54.2	0.8	51.6	1.2	54.2	52.3	54.2	0.8	54.2	1.4	54.2	0.8	0.0	(Cc.)
OD-3 zircon	682	430	1.6	0.05	0.00	0.01	0.00	0.03	0.00	0.44	169.9	72.7	32.6	0.5	34.0	1.1	32.4	79.1	32.4	0.5	32.4	1.2	32.4	0.5	0.0	(Cc.)
NIST SRM 612	30	11	2.7	0.91	0.01	0.83	0.03	104.93	3.99	0.92	5116.3	20.6	3893.3	101.9	4722.0	35.5										
NIST SRM 612	41	13	3.2	0.91	0.01	0.85	0.03	108.52	3.89	0.91	5128.6	20.6	3966.6	96.2	4755.8	33.1										
NIST SRM 612	39	13	3.0	0.91	0.01	0.86	0.03	109.50	3.88	0.91	5122.9	20.6	4005.5	95.7	4764.9	32.8										
91500 zircon	51	103	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.71	1096.8	32.9	1063.9	16.3	1066.5	12.8	1062.4	33.6	1062.4	16.3	1062.4	15.5	1062.4	33.6	0.0	(Cc.)
91500 zircon	43	74	0.6	0.08	0.00	0.18	0.00	1.89	0.05	0.73	1099.2	34.1	1066.9	17.7	1069.3	13.9	1065.4	34.9	1065.4	17.7	1065.4	16.5	1065.4	34.9	0.0	(Cc.)
91500 zircon	47	95	0.5	0.07	0.00	0.18	0.00	1.84	0.04	0.71	1053.4	33.5	1062.3	16.6	1051.2	12.9	1062.7	33.3	1062.7	16.6	1062.7	15.6	1062.7	33.3	0.0	(Cc.)
NIST SRM 612	29	11	2.7	0.90	0.01	0.83	0.03	105.06	3.67	0.95	5115.6	15.0	3898.5	96.5	4721.9	33.4										
NIST SRM 612	39	12	3.1	0.91	0.00	0.85	0.03	108.66	3.53	0.94	5127.9	15.1	3971.9	90.3	4755.7	30.9										
NIST SRM 612	38	13	2.9	0.91	0.00	0.86	0.03	109.64	3.52	0.94	5122.1	15.1	4010.8	89.7	4764.8	30.5										
91500 zircon	50	101	0.5	0.07	0.00	0.18	0.00	1.88	0.03	0.68	1095.8	26.2	1065.7	12.0	1066.4	9.9	1064.3	26.7	1064.3	11.9	1064.3	11.9	1064.3	26.7	0.0	(Cc.)
91500 zircon	42	73	0.6	0.08	0.00	0.18	0.00	1.89	0.04	0.71	1098.2	27.7	1068.6	13.7	1069.2	11.3	1067.2	28.3	1067.2	13.7	1067.2	13.1	1067.2	28.3	0.0	(Cc.)
91500 zircon	46	93	0.5	0.07	0.00	0.18	0.00	1.84	0.03	0.69	1052.4	26.8	1064.0	12.3	1051.1	10.2	1064.6	26.6	1064.6	12.4	1064.6	12.0	1064.6	26.6	0.0	(Cc.)
GJ-1 zircon	43	563	0.1	0.06	0.00	0.10	0.00	0.81	0.01	0.52	634.6	25.4	592.9	4.1	595.3	4.3	592.0	26.1	592.0	4.1	592.0	6.3	592.0	4.1	0.0	(Cc.)
ST24MG2-40	374	482	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.37	112.8	53.9	53.4	0.5	54.0	1.2	53.3	55.9	53.3	0.5	53.3	1.3	53.3	0.5	0.0	(Cc.)
ST24MG2-41	1059	841	1.2	0.05	0.00	0.01	0.00	0.06	0.00	0.38	57.7	44.9	54.3	0.4	53.7	1.0	54.3	45.0	54.3	0.5	54.3	1.1	54.3	0.5	0.0	(Cc.)
ST24MG2-42	518	770	0.7	0.05	0.00	0.03	0.00	0.23	0.00	0.47	266.5	30.5	206.4	1.4	208.7	2.2	206.1	31.6	206.1	1.4	206.1	2.9	206.1	1.4	0.0	(Cc.)
ST24MG2-43	244	216	1.1	0.07	0.00	0.01	0.00	0.08	0.00	0.41	889.2	54.9	56.4	0.7	80.1	2.3	54.9	92.4	54.9	0.6	54.9	2.2	54.9	0.6	0.0	(Cc.)

ST24MG2-44	329	358	0.9	0.06	0.00	0.01	0.00	0.07	0.00	0.39	605.0	50.4	54.9	0.5	68.5	1.6	54.0	70.8	54.0	0.5	54.0	1.6	54.0	0.5	0.0	(Cc.)
ST24MG2-45	1480	811	1.8	0.07	0.00	0.01	0.00	0.11	0.00	0.44	845.9	32.1	74.2	0.6	102.1	1.4	72.3	52.0	72.3	0.6	72.3	1.6	72.3	0.6	0.0	(Cc.)
ST24MG2-46	138	175	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.35	142.9	79.7	57.2	0.7	58.4	2.1	57.1	83.9	57.1	0.7	57.1	2.1	57.1	0.7	0.0	(Cc.)
ST24MG2-47	424	512	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.37	161.7	50.7	57.0	0.5	58.7	1.3	56.8	54.0	56.8	0.5	56.8	1.3	56.8	0.5	0.0	(Cc.)
ST24MG2-48	169	234	0.7	0.05	0.00	0.01	0.00	0.07	0.00	0.37	192.0	63.6	68.2	0.8	70.8	2.0	67.9	68.7	67.9	0.8	67.9	2.0	67.9	0.8	0.0	(Cc.)
ST24MG2-49	231	236	1.0	0.05	0.00	0.01	0.00	0.06	0.00	0.36	185.4	70.7	53.5	0.6	55.8	1.8	53.4	76.6	53.4	0.6	53.4	1.8	53.4	0.6	0.0	(Cc.)
ST24MG2-50	126	559	0.2	0.05	0.00	0.01	0.00	0.07	0.00	0.39	282.6	45.8	61.4	0.5	66.4	1.3	61.0	52.5	61.0	0.5	61.0	1.4	61.0	0.5	0.0	(Cc.)
ST24MG2-51	349	322	1.1	0.05	0.00	0.01	0.00	0.06	0.00	0.36	87.6	61.0	60.7	0.6	60.5	1.6	60.7	62.0	60.7	0.6	60.7	1.6	60.7	0.6	0.0	(Cc.)
ST24MG2-52	422	579	0.7	0.05	0.00	0.01	0.00	0.10	0.00	0.41	171.1	40.8	92.9	0.7	94.6	1.5	92.7	42.8	92.7	0.8	92.7	1.8	92.7	0.8	0.0	(Cc.)
OD-3 zircon	558	398	1.4	0.04	0.00	0.01	0.00	0.03	0.00	0.31	0.0	72.4	32.3	0.3	29.6	1.0	32.3	71.7	32.3	0.3	32.3	1.0	32.3	0.3	0.0	(Cc.)
NIST SRM 612	39	13	2.9	0.91	0.00	0.81	0.02	102.71	3.24	0.94	5116.6	15.1	3830.5	85.1	4699.1	29.9										
NIST SRM 612	36	12	3.1	0.91	0.01	0.85	0.03	107.13	3.59	0.95	5116.5	15.1	3953.8	93.3	4741.4	32.0										
NIST SRM 612	42	13	3.2	0.91	0.00	0.83	0.03	105.41	3.39	0.94	5119.8	15.1	3899.4	88.1	4725.2	30.5										
91500 zircon	45	88	0.5	0.07	0.00	0.18	0.00	1.84	0.03	0.69	1074.9	27.0	1053.1	12.5	1051.1	10.4	1052.0	27.4	1052.0	12.5	1052.0	12.2	1052.0	27.4	0.0	(Cc.)
91500 zircon	49	92	0.5	0.07	0.00	0.18	0.00	1.88	0.03	0.69	1094.5	26.6	1065.5	12.4	1065.9	10.3	1064.1	27.1	1064.1	12.4	1064.1	12.2	1064.1	27.1	0.0	(Cc.)
91500 zircon	51	94	0.5	0.07	0.00	0.18	0.00	1.87	0.03	0.69	1084.2	26.6	1061.4	12.2	1059.8	10.2	1060.4	27.0	1060.4	12.2	1060.4	12.1	1060.4	27.0	0.0	(Cc.)
NIST SRM 612	39	14	2.9	0.90	0.00	0.82	0.03	103.38	3.61	0.88	5114.6	23.5	3853.6	88.5	4706.3	30.8										
NIST SRM 612	36	12	3.1	0.90	0.00	0.85	0.03	107.83	3.96	0.89	5114.4	23.5	3977.4	96.6	4748.6	32.9										
NIST SRM 612	41	13	3.2	0.91	0.00	0.84	0.03	106.10	3.77	0.88	5117.8	23.5	3922.8	91.5	4732.4	31.5										
91500 zircon	45	89	0.5	0.07	0.00	0.18	0.00	1.85	0.04	0.63	1071.8	37.2	1060.8	14.8	1055.8	11.6	1060.4	37.5	1060.4	14.8	1060.4	15.8	1060.4	37.5	0.0	(Cc.)
91500 zircon	49	93	0.5	0.07	0.00	0.18	0.00	1.89	0.04	0.63	1091.5	36.9	1073.3	14.8	1070.6	11.5	1072.5	37.3	1072.5	14.8	1072.5	15.8	1072.5	37.3	0.0	(Cc.)
91500 zircon	51	95	0.5	0.07	0.00	0.18	0.00	1.88	0.04	0.63	1081.3	36.9	1069.3	14.6	1064.5	11.4	1068.7	37.2	1068.7	14.6	1068.7	15.7	1068.7	37.2	0.0	(Cc.)
GJ-1 zircon	38	516	0.1	0.06	0.00	0.10	0.00	0.81	0.02	0.53	649.6	37.4	589.6	6.1	596.2	5.6	588.4	38.9	588.5	6.1	588.5	9.4	588.5	6.1	0.0	(Cc.)
ST24MG2-53	741	673	1.1	0.05	0.00	0.01	0.00	0.07	0.00	0.45	110.7	52.6	72.2	0.8	72.5	1.4	72.2	53.9	72.2	0.8	72.2	1.8	72.2	0.8	0.0	(Cc.)
ST24MG2-54	1237	1170	1.0	0.06	0.00	0.01	0.00	0.07	0.00	0.46	514.4	44.9	53.5	0.6	64.3	1.1	52.8	59.7	52.8	0.6	52.8	1.4	52.8	0.6	0.0	(Cc.)
ST24MG2-55	1250	960	1.3	0.07	0.00	0.01	0.00	0.08	0.00	0.47	909.3	41.9	55.8	0.6	80.0	1.3	54.2	71.5	54.2	0.6	54.2	1.7	54.2	0.6	0.0	(Cc.)
ST24MG2-56	701	663	1.0	0.05	0.00	0.01	0.00	0.06	0.00	0.44	106.7	55.6	59.5	0.7	59.9	1.2	59.5	57.2	59.5	0.7	59.5	1.5	59.5	0.7	0.0	(Cc.)
ST24MG2-57	668	580	1.1	0.06	0.00	0.01	0.00	0.07	0.00	0.44	555.4	51.6	53.5	0.6	65.4	1.4	52.7	70.4	52.7	0.6	52.7	1.6	52.7	0.6	0.0	(Cc.)
ST24MG2-58	696	740	0.9	0.07	0.00	0.01	0.00	0.11	0.00	0.48	984.1	41.5	68.2	0.8	100.6	1.7	66.1	73.7	66.1	0.7	66.1	2.1	66.1	0.7	0.0	(Cc.)
ST24MG2-59	370	325	1.1	0.05	0.00	0.01	0.00	0.08	0.00	0.42	75.5	64.3	74.4	0.9	73.5	1.8	74.4	64.3	74.4	1.0	74.4	2.1	74.4	1.0	0.0	(Cc.)
ST24MG2-60	99	127	0.8	0.21	0.00	0.02	0.00	0.55	0.01	0.60	2893.3	32.5	121.4	1.8	437.9	7.5	97.0	206.3	97.0	1.2	97.0	8.1	97.0	1.2	0.0	(Cc.)
ST24MG2-61	324	450	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.42	5.9	63.8	59.5	0.7	57.5	1.4	60.4	61.7	60.4	0.7	60.4	1.7	60.4	0.7	0.0	(Cc.)

ST24MG2-62	483	411	1.2	0.05	0.00	0.01	0.00	0.06	0.00	0.41	71.5	65.0	56.9	0.7	56.5	1.4	56.9	65.6	56.9	0.7	56.9	1.7	56.9	0.7	0.0	(Cc.)
ST24MG2-63	415	527	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.42	156.5	59.5	54.0	0.6	55.6	1.3	53.8	63.4	53.9	0.6	53.9	1.5	53.9	0.6	0.0	(Cc.)
ST24MG2-64	167	215	0.8	0.05	0.00	0.02	0.00	0.11	0.00	0.44	137.3	63.7	107.8	1.4	107.7	2.7	107.7	64.9	107.7	1.4	107.7	3.1	107.7	1.4	0.0	(Cc.)
ST24MG2-65	261	357	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.41	274.9	64.7	53.9	0.7	58.4	1.6	53.6	74.1	53.6	0.7	53.6	1.8	53.6	0.7	0.0	(Cc.)
OD-3 zircon	704	440	1.6	0.05	0.00	0.00	0.00	0.04	0.00	0.38	262.6	72.2	32.0	0.4	34.7	1.1	31.8	83.1	31.8	0.4	31.8	1.2	31.8	0.4	0.0	(Cc.)
NIST SRM 612	37	12	3.0	0.91	0.00	0.86	0.03	109.45	3.98	0.89	5123.3	23.5	4003.2	95.8	4763.7	32.5										
NIST SRM 612	33	12	2.7	0.91	0.00	0.84	0.03	106.36	3.90	0.89	5121.5	23.5	3922.1	95.4	4734.8	32.8										
NIST SRM 612	37	12	3.1	0.91	0.00	0.88	0.03	112.20	4.14	0.89	5121.5	23.5	4081.6	98.7	4788.7	33.0										
91500 zircon	44	94	0.5	0.07	0.00	0.18	0.00	1.81	0.04	0.63	1052.9	37.2	1047.0	14.4	1040.3	11.3	1046.7	37.4	1046.7	14.4	1046.7	15.5	1046.7	37.4	0.0	(Cc.)
91500 zircon	46	93	0.5	0.08	0.00	0.18	0.00	1.91	0.05	0.63	1138.0	36.6	1059.2	14.6	1076.6	11.5	1055.6	38.6	1055.6	14.5	1055.6	15.9	1055.6	38.6	0.0	(Cc.)
91500 zircon	45	89	0.5	0.07	0.00	0.18	0.00	1.86	0.04	0.63	1063.2	37.2	1068.6	14.9	1058.2	11.6	1068.9	37.1	1068.9	14.9	1068.9	15.8	1068.9	37.1	0.0	(Cc.)
NIST SRM 612	36	12	3.0	0.91	0.01	0.87	0.03	109.84	4.06	0.90	5113.5	22.5	4034.6	99.3	4771.3	33.9										
NIST SRM 612	32	12	2.7	0.91	0.01	0.85	0.03	106.74	3.98	0.90	5111.8	22.5	3953.0	98.8	4742.5	34.2										
NIST SRM 612	36	12	3.1	0.91	0.01	0.89	0.03	112.61	4.22	0.90	5111.8	22.5	4113.4	102.2	4796.3	34.4										
91500 zircon	44	93	0.5	0.07	0.00	0.18	0.00	1.82	0.04	0.69	1039.0	36.0	1057.1	16.5	1045.2	13.0	1058.0	35.6	1058.0	16.5	1058.0	16.1	1058.0	35.6	0.0	(Cc.)
91500 zircon	45	92	0.5	0.08	0.00	0.18	0.00	1.92	0.05	0.69	1124.3	35.4	1069.5	16.7	1081.6	13.2	1067.0	36.7	1067.0	16.7	1067.0	16.5	1067.0	36.7	0.0	(Cc.)
91500 zircon	44	88	0.5	0.07	0.00	0.18	0.00	1.87	0.05	0.69	1049.3	36.1	1079.0	17.1	1063.2	13.3	1080.4	35.4	1080.4	17.1	1080.4	16.4	1080.4	35.4	0.0	(Cc.)
GJ-1 zircon	82	129	0.6	0.05	0.00	0.01	0.00	0.07	0.00	0.43	109.6	88.6	71.6	1.3	72.1	2.8	71.5	90.7	71.5	1.3	71.5	2.9	71.5	1.3	0.0	(Cc.)
ST24MG2-66	611	641	0.9	0.06	0.00	0.01	0.00	0.10	0.00	0.56	629.7	44.8	74.1	1.0	93.0	1.9	72.9	63.2	72.9	1.0	72.9	2.1	72.9	1.0	0.0	(Cc.)
ST24MG2-67	246	312	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.47	275.6	66.4	54.4	0.8	59.2	1.8	54.1	76.1	54.1	0.8	54.1	1.9	54.1	0.8	0.0	(Cc.)
ST24MG2-68	507	518	1.0	0.05	0.00	0.01	0.00	0.09	0.00	0.54	173.1	51.9	84.1	1.2	86.4	1.9	83.9	54.8	83.9	1.1	83.9	2.2	83.9	1.1	0.0	(Cc.)
ST24MG2-69	969	973	1.0	0.05	0.00	0.01	0.00	0.09	0.00	0.57	396.2	44.1	73.1	1.0	82.9	1.5	72.5	53.9	72.5	0.9	72.5	1.8	72.5	0.9	0.0	(Cc.)
ST24MG2-70	296	328	0.9	0.05	0.00	0.03	0.00	0.21	0.01	0.57	209.3	47.3	191.2	2.7	191.0	3.6	191.1	47.8	191.1	2.7	191.1	4.4	191.1	2.7	0.0	(Cc.)
ST24MG2-71	951	731	1.3	0.05	0.00	0.01	0.00	0.06	0.00	0.53	356.2	50.1	54.7	0.8	61.5	1.3	54.2	60.3	54.2	0.8	54.2	1.5	54.2	0.8	0.0	(Cc.)
ST24MG2-72	200	290	0.7	0.05	0.00	0.01	0.00	0.06	0.00	0.46	160.9	71.1	53.9	0.8	55.8	1.8	53.7	75.9	53.7	0.8	53.7	1.9	53.7	0.8	0.0	(Cc.)
ST24MG2-73	168	238	0.7	0.26	0.00	0.01	0.00	0.40	0.01	0.65	3246.7	28.9	71.7	1.1	339.6	6.1	52.5	242.3	52.5	0.6	52.5	5.2	<u>52.5*</u>	<u>0.6*</u>	0.0	(Cc.)
ST24MG2-74	70	120	0.6	0.05	0.00	0.01	0.00	0.08	0.00	0.44	244.3	87.2	71.0	1.3	75.6	3.0	70.6	97.0	70.6	1.3	70.6	3.1	70.6	1.3	0.0	(Cc.)
ST24MG2-75	33651	9416	3.5	0.05	0.00	0.01	0.00	0.06	0.00	0.61	284.9	37.9	56.1	0.7	61.2	0.9	55.8	43.6	55.8	0.7	55.8	1.2	55.8	0.7	0.0	(Cc.)
ST24MG2-76	346	327	1.0	0.05	0.00	0.01	0.00	0.08	0.00	0.49	127.0	62.1	72.9	1.1	73.9	2.0	72.8	64.2	72.8	1.1	72.8	2.2	72.8	1.1	0.0	(Cc.)
ST24MG2-77	434	509	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.49	123.3	59.9	53.5	0.8	54.6	1.4	53.4	62.5	53.5	0.8	53.5	1.6	53.5	0.8	0.0	(Cc.)
OD-3 zircon	634	452	1.4	0.05	0.00	0.01	0.00	0.03	0.00	0.44	117.2	74.0	32.6	0.5	33.5	1.1	32.5	77.9	32.5	0.5	32.5	1.2	32.5	0.5	0.0	(Cc.)
OD-3 zircon	nan	nan	nan	nan	nan	nan	nan	nan	nan				nan	nan	nan	nan										

NIST SRM 612	39	13	3.0	0.91	0.01	0.88	0.03	111.51	4.00	0.90	5118.2	22.5	4069.8	96.2	4786.4	32.7										
NIST SRM 612	39	12	3.2	0.92	0.01	0.88	0.03	111.41	4.12	0.90	5125.2	22.5	4052.4	99.8	4785.6	33.9										
NIST SRM 612	41	14	3.0	0.90	0.01	0.83	0.03	103.07	3.65	0.89	5098.4	22.5	3878.2	91.5	4707.4	32.2										
91500 zircon	46	94	0.5	0.08	0.00	0.18	0.00	1.84	0.05	0.69	1090.4	35.7	1046.3	16.3	1054.7	13.0	1044.3	36.7	1044.3	16.3	1044.3	16.2	1044.3	36.7	0.0	(Cc.)
91500 zircon	51	102	0.5	0.08	0.00	0.18	0.00	1.86	0.05	0.69	1093.3	35.3	1054.3	16.1	1061.0	12.8	1052.5	36.3	1052.5	16.1	1052.5	16.1	1052.5	36.3	0.0	(Cc.)
91500 zircon	50	104	0.5	0.08	0.00	0.18	0.00	1.90	0.05	0.69	1102.6	35.2	1072.0	16.3	1076.0	12.8	1070.6	35.9	1070.6	16.3	1070.6	16.1	1070.6	35.9	0.0	(Cc.)
NIST SRM 612	40	13	3.0	0.91	0.01	0.89	0.03	111.36	3.78	0.93	5106.3	17.6	4091.4	94.8	4792.2	32.2										
NIST SRM 612	39	12	3.2	0.91	0.01	0.88	0.03	111.26	3.91	0.93	5113.2	17.6	4074.0	98.5	4791.3	33.5										
NIST SRM 612	42	14	3.0	0.90	0.01	0.83	0.03	102.94	3.44	0.93	5086.4	17.6	3899.1	90.1	4713.1	31.7										
91500 zircon	47	95	0.5	0.08	0.00	0.18	0.00	1.84	0.04	0.73	1073.4	29.7	1053.2	15.3	1058.4	12.5	1052.3	30.1	1052.3	15.3	1052.3	14.2	1052.3	30.1	0.0	(Cc.)
91500 zircon	51	103	0.5	0.08	0.00	0.18	0.00	1.86	0.04	0.73	1076.4	29.3	1061.2	15.1	1064.8	12.3	1060.5	29.6	1060.5	15.1	1060.5	14.1	1060.5	29.6	0.0	(Cc.)
91500 zircon	51	106	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.73	1085.6	29.1	1079.1	15.3	1079.8	12.3	1078.8	29.2	1078.8	15.3	1078.8	14.1	1078.8	29.2	0.0	(Cc.)
GJ-1 zircon	40	536	0.1	0.06	0.00	0.10	0.00	0.82	0.01	0.67	616.0	29.1	605.9	7.0	607.0	6.7	605.6	29.3	605.6	7.0	605.6	8.3	605.6	7.0	0.0	(Cc.)
ST24MG2-79	1103	728	1.5	0.07	0.00	0.01	0.00	0.11	0.00	0.58	806.3	36.1	74.7	0.9	102.1	1.8	72.9	57.1	72.9	0.9	72.9	1.9	72.9	0.9	0.0	(Cc.)
ST24MG2-80	556	400	1.4	0.05	0.00	0.01	0.00	0.08	0.00	0.51	194.4	52.1	75.0	1.0	78.6	1.9	74.8	56.1	74.8	1.0	74.8	2.0	74.8	1.0	0.0	(Cc.)
ST24MG2-81	150	188	0.8	0.05	0.00	0.02	0.00	0.12	0.00	0.51	298.6	57.3	110.4	1.6	119.0	3.2	109.9	64.3	109.9	1.6	109.9	3.2	109.9	1.6	0.0	(Cc.)
ST24MG2-82	840	547	1.5	0.08	0.00	0.01	0.00	0.09	0.00	0.56	1101.3	38.2	57.2	0.7	90.7	1.9	55.1	73.8	55.1	0.7	55.1	1.8	55.1	0.7	0.0	(Cc.)
ST24MG2-83	593	579	1.0	0.05	0.00	0.01	0.00	0.06	0.00	0.50	137.8	52.0	54.8	0.7	56.6	1.3	54.7	54.7	54.7	0.7	54.7	1.4	54.7	0.7	0.0	(Cc.)
ST24MG2-84	244	916	0.3	0.06	0.00	0.06	0.00	0.47	0.01	0.66	641.0	29.1	349.4	4.0	389.7	4.7	346.2	35.0	346.2	3.9	346.2	5.7	346.2	3.9	0.0	(Cc.)
ST24MG2-85	384	739	0.5	0.05	0.00	0.01	0.00	0.11	0.00	0.58	303.3	39.4	94.5	1.1	102.7	1.8	93.9	44.8	93.9	1.1	93.9	2.0	93.9	1.1	0.0	(Cc.)
ST24MG2-86	390	368	1.1	0.06	0.00	0.01	0.00	0.09	0.00	0.52	451.1	48.6	77.0	1.0	89.8	2.1	76.1	61.3	76.2	1.0	76.2	2.1	76.2	1.0	0.0	(Cc.)
ST24MG2-87	307	320	1.0	0.07	0.00	0.01	0.00	0.08	0.00	0.50	780.8	50.9	56.6	0.8	77.2	2.0	55.3	80.0	55.3	0.7	55.3	2.0	55.3	0.7	0.0	(Cc.)
ST24MG2-88	-602	-466	1.3	0.06	nan	0.01	nan	0.08	nan				56.9	nan	73.9	nan										
ST24MG2-89	198	235	0.8	0.05	0.00	0.01	0.00	0.06	0.00	0.43	0.0	76.0	56.0	0.8	54.4	1.9	56.0	74.2	56.0	0.8	56.0	1.9	56.0	0.8	0.0	(Cc.)
ST24MG2-90	392	410	1.0	0.10	0.00	0.01	0.00	0.14	0.00	0.59	1671.6	33.9	64.3	0.9	134.4	2.7	59.9	94.9	59.9	0.7	59.9	2.4	59.9	0.7	0.0	(Cc.)
ST24MG2-91	831	473	1.7	0.05	0.00	0.01	0.00	0.06	0.00	0.49	211.1	54.1	56.5	0.7	60.1	1.5	56.3	59.5	56.3	0.8	56.3	1.5	56.3	0.8	0.0	(Cc.)
OD-3 zircon	892	521	1.7	0.05	0.00	0.01	0.00	0.04	0.00	0.44	159.8	64.6	33.2	0.5	34.9	1.0	33.1	69.8	33.1	0.5	33.1	1.1	33.1	0.5	0.0	(Cc.)
NIST SRM 612	26	10	2.7	0.91	0.01	0.86	0.03	107.22	4.13	0.95	5100.8	17.6	3989.5	107.5	4754.1	36.9										
NIST SRM 612	39	13	3.0	0.91	0.01	0.89	0.03	111.45	3.81	0.93	5108.3	17.6	4089.5	95.8	4793.0	32.5										
NIST SRM 612	38	12	3.1	0.91	0.01	0.89	0.03	111.69	3.91	0.93	5104.4	17.6	4104.3	98.6	4795.1	33.3										
91500 zircon	49	97	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.73	1086.8	29.5	1065.5	15.4	1071.1	12.5	1064.5	29.9	1064.5	15.4	1064.5	14.3	1064.5	29.9	0.0	(Cc.)
91500 zircon	44	92	0.5	0.07	0.00	0.18	0.00	1.83	0.04	0.73	1068.8	29.9	1049.4	15.4	1054.3	12.6	1048.5	30.3	1048.5	15.4	1048.5	14.3	1048.5	30.3	0.0	(Cc.)

91500 zircon	48	100	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.73	1108.8	29.2	1069.7	15.4	1081.2	12.5	1067.9	30.0	1067.9	15.3	1067.9	14.3	1067.9	30.0	0.0	(Cc.)
NIST SRM 612	27	10	2.7	0.91	0.00	0.85	0.03	106.50	4.03	0.98	5103.0	11.1	3964.9	108.6	4745.8	36.9	5091.3	11.2	5091.0	184.0	5091.3	53.4	5091.3	11.2	0.0	(Cc.)
NIST SRM 612	41	13	3.0	0.91	0.00	0.88	0.03	110.70	3.70	0.97	5110.5	11.2	4064.4	97.2	4784.7	32.5	5096.4	11.3	5096.0	157.0	5096.4	45.7	5096.4	11.3	0.0	(Cc.)
NIST SRM 612	40	13	3.1	0.91	0.00	0.88	0.03	110.94	3.80	0.97	5106.6	11.1	4079.1	100.0	4786.8	33.3	5094.3	11.3	5094.0	160.0	5094.3	46.6	5094.3	11.3	0.0	(Cc.)
91500 zircon	52	101	0.5	0.08	0.00	0.18	0.00	1.86	0.04	0.84	1090.0	22.2	1057.4	16.6	1065.6	12.5	1055.9	22.7	1055.9	16.5	1055.9	13.4	1055.9	22.7	0.0	(Cc.)
91500 zircon	46	96	0.5	0.07	0.00	0.18	0.00	1.82	0.04	0.84	1071.8	22.7	1041.4	16.5	1048.9	12.6	1040.1	23.2	1040.1	16.5	1040.1	13.4	1040.1	23.2	0.0	(Cc.)
91500 zircon	51	104	0.5	0.08	0.00	0.18	0.00	1.89	0.04	0.84	1111.9	21.9	1061.6	16.5	1075.7	12.5	1059.2	22.7	1059.2	16.4	1059.2	13.3	1059.2	22.7	0.0	(Cc.)
GJ-1 zircon	41	563	0.1	0.06	0.00	0.10	0.00	0.81	0.01	0.82	628.0	20.3	596.9	7.8	601.8	6.7	596.3	20.7	596.3	7.8	596.3	7.5	596.3	7.8	0.0	(Cc.)
ST24MG2-92	571	606	0.9	0.05	0.00	0.01	0.00	0.06	0.00	0.58	83.8	47.7	54.5	0.8	55.0	1.3	54.5	48.5	54.5	0.8	54.5	1.3	54.5	0.8	0.0	(Cc.)
ST24MG2-93	117	139	0.8	0.04	0.00	0.01	0.00	0.05	0.00	0.41	0.0	89.2	56.6	1.0	49.5	2.3	56.5	87.1	56.5	1.0	56.5	2.3	56.5	1.0	0.0	(Cc.)
ST24MG2-94	115	187	0.6	0.05	0.00	0.01	0.00	0.10	0.00	0.53	79.5	63.3	93.4	1.5	92.5	2.8	93.4	62.8	93.4	1.5	93.4	2.8	93.4	1.5	0.0	(Cc.)
ST24MG2-95	247	393	0.6	0.05	0.00	0.01	0.00	0.09	0.00	0.60	241.1	45.0	84.2	1.2	89.5	2.1	83.9	49.5	83.9	1.2	83.9	2.1	83.9	1.2	0.0	(Cc.)
ST24MG2-96	963	894	1.1	0.05	0.00	0.01	0.00	0.05	0.00	0.62	28.2	41.8	54.2	0.8	53.5	1.1	54.3	41.1	54.3	0.8	54.3	1.2	54.3	0.8	0.0	(Cc.)
ST24MG2-97	146	201	0.7	0.05	0.00	0.01	0.00	0.07	0.00	0.48	85.4	71.9	65.3	1.1	65.6	2.3	65.3	72.8	65.3	1.1	65.3	2.2	65.3	1.1	0.0	(Cc.)
ST24MG2-98	140	234	0.6	0.05	0.00	0.01	0.00	0.06	0.00	0.49	115.1	69.0	60.3	1.0	61.5	2.0	60.2	71.3	60.2	1.0	60.2	2.0	60.2	1.0	0.0	(Cc.)
ST24MG2-99	144	146	1.0	0.08	0.00	0.01	0.00	0.13	0.00	0.57	1164.6	50.6	76.1	1.3	122.6	3.7	73.1	100.6	73.1	1.2	73.1	3.2	73.1	1.2	0.0	(Cc.)
ST24MG2-100	380	447	0.8	0.05	0.00	0.01	0.00	0.07	0.00	0.58	142.0	48.9	66.4	1.0	68.3	1.7	66.3	51.2	66.3	1.0	66.3	1.7	66.3	1.0	0.0	(Cc.)
ST24MG2-101	97	175	0.5	0.05	0.00	0.01	0.00	0.08	0.00	0.49	228.3	69.3	72.0	1.2	76.5	2.6	71.7	76.2	71.7	1.2	71.7	2.5	71.7	1.2	0.0	(Cc.)
ST24MG2-102	237	838	0.3	0.05	0.00	0.02	0.00	0.11	0.00	0.71	154.3	31.8	108.1	1.5	109.8	1.9	108.0	32.7	108.0	1.5	108.0	2.0	108.0	1.5	0.0	(Cc.)
ST24MG2-103	184	185	1.0	0.05	0.00	0.05	0.00	0.40	0.01	0.72	348.3	33.6	338.8	5.1	339.0	5.9	338.8	33.8	338.8	5.1	338.8	6.2	338.8	5.1	0.0	(Cc.)
ST24MG2-104	307	310	1.0	0.05	0.00	0.02	0.00	0.13	0.00	0.63	416.8	41.1	113.2	1.7	127.8	2.8	112.2	49.6	112.2	1.7	112.2	2.7	112.2	1.7	0.0	(Cc.)
OD-3 zircon	1605	817	2.0	0.05	0.00	0.01	0.00	0.03	0.00	0.55	72.6	52.7	32.7	0.5	33.2	0.9	32.7	54.0	32.7	0.5	32.7	0.9	32.7	0.5	0.0	(Cc.)
NIST SRM 612	41	13	3.2	0.91	0.00	0.86	0.03	108.56	3.70	0.97	5105.0	11.1	4017.6	98.5	4765.1	33.2	5092.9	11.2	5093.0	163.0	5092.9	47.3	5092.9	11.2	0.0	(Cc.)
NIST SRM 612	37	13	2.9	0.91	0.00	0.82	0.03	102.27	3.50	0.97	5104.5	11.1	3843.1	95.7	4705.0	33.3	5091.3	11.3	5091.0	173.0	5091.3	50.2	5091.3	11.3	0.0	(Cc.)
NIST SRM 612	36	12	3.0	0.91	0.00	0.88	0.03	110.12	3.85	0.97	5103.1	11.1	4064.4	101.9	4779.4	34.1	5092.1	11.2	5092.0	164.0	5092.1	47.8	5092.1	11.2	0.0	(Cc.)
91500 zircon	54	106	0.5	0.07	0.00	0.18	0.00	1.86	0.04	0.84	1065.2	22.1	1069.3	16.5	1065.5	12.4	1069.5	22.0	1069.5	16.6	1069.5	13.3	1069.5	22.0	0.0	(Cc.)
91500 zircon	57	109	0.5	0.08	0.00	0.18	0.00	1.89	0.04	0.84	1078.9	21.8	1074.5	16.5	1073.5	12.3	1074.3	21.9	1074.3	16.5	1074.3	13.2	1074.3	21.9	0.0	(Cc.)
91500 zircon	50	103	0.5	0.08	0.00	0.18	0.00	1.89	0.04	0.84	1082.5	22.1	1074.0	16.7	1074.4	12.5	1073.6	22.2	1073.6	16.7	1073.6	13.4	1073.6	22.2	0.0	(Cc.)
NIST SRM 612	41	13	3.2	0.91	0.01	0.87	0.03	108.36	3.62	0.99	5100.4	6.9	4021.7	98.2	4766.0	33.3	5090.4	7.0	5090.0	162.0	5090.3	46.6	5090.4	7.0	0.0	(Cc.)
NIST SRM 612	37	13	2.9	0.91	0.01	0.82	0.03	102.08	3.43	0.99	5099.9	6.9	3847.1	95.5	4705.9	33.4	5089.0	7.0	5089.0	172.0	5089.0	49.6	5089.0	7.0	0.0	(Cc.)
NIST SRM 612	36	12	3.0	0.91	0.01	0.88	0.03	109.91	3.77	0.99	5098.5	6.9	4068.6	101.7	4780.3	34.2	5089.6	7.0	5090.0	163.0	5089.6	47.1	5089.6	7.0	0.0	(Cc.)
91500 zircon	54	105	0.5	0.07	0.00	0.18	0.00	1.86	0.04	0.88	1058.7	18.2	1070.7	16.3	1066.1	12.5	1071.2	18.1	1071.2	16.4	1071.2	12.5	1071.2	18.1	0.0	(Cc.)

91500 zircon	56	109	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.88	1072.3	17.9	1075.8	16.3	1074.1	12.4	1076.0	17.9	1076.0	16.3	1076.0	12.4	1076.0	17.9	0.0	(Cc.)
91500 zircon	50	102	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.88	1075.9	18.3	1075.4	16.5	1075.0	12.6	1075.4	18.3	1075.4	16.5	1075.4	12.6	1075.4	18.3	0.0	(Cc.)
GJ-1 zircon	42	586	0.1	0.06	0.00	0.10	0.00	0.80	0.01	0.88	593.3	15.3	596.6	7.6	595.5	6.7	596.6	15.3	596.6	7.6	596.6	6.8	596.6	7.6	0.0	(Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 102
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age})/(^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

C.4 Middle of Saroma Group (ST17MSR1)

U-Pb LA-ICP-MS Detrital Zircon Data of Mukaiengaru Unit

Sample Location: Station-17, Saroma Area, Eastern Hokkaido, Japan

Member / Group: Middle Member / Saroma Group

Belt: Tokoro Belt

Sample Type: Sandstone

Grain Number	Th (PPM)	U (PPM)	Th /U	Isotopic Ratios							U-Pb Age (Ma)						U-Pb Age (Ma)						Prefer red Age	± 1σ	Disc. (%)	
											<i>before Stacey-Kramers Correction</i>						<i>after Stacey-Kramers Correction</i>									
				207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ	207Pb/ 235U	± 1σ	Error Corr.	207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ	207Pb/ 235U	± 1σ	207Pb/ 206Pb	± 1σ	206Pb/ 238U	± 1σ	207Pb/ 235U	± 1σ				
ST17MSR1-1	58	85	0.7	0.07	0.00	0.04	0.00	0.39	0.01	0.69	935.8	39.1	251.7	4.5	331.0	7.7	245.8	60.4	245.8	4.3	245.8	6.9	245.8	4.3	0.0	(Cc.)
ST17MSR1-2	120	85	1.4	0.05	0.00	0.03	0.00	0.20	0.01	0.58	330.9	59.9	173.9	3.2	185.0	5.7	173.1	66.0	173.1	3.2	173.1	5.4	173.1	3.2	0.0	(Cc.)
ST17MSR1-3	209	272	0.8	0.05	0.00	0.01	0.00	0.09	0.00	0.56	237.9	52.4	77.9	1.2	83.1	2.3	77.6	57.8	77.6	1.2	77.6	2.1	77.6	1.2	0.0	(Cc.)
ST17MSR1-4	2815	912	3.1	0.10	0.00	0.02	0.00	0.23	0.00	0.84	1596.7	16.4	107.1	1.4	208.1	3.0	100.4	42.7	100.4	1.2	100.4	2.1	100.4	1.2	0.0	(Cc.)
ST17MSR1-5	106	114	0.9	0.12	0.00	0.34	0.01	5.63	0.10	0.93	1956.7	11.6	1887.2	26.5	1919.8	14.9	1877.4	12.2	1877.4	26.3	1877.4	15.0	1877.4	12.2	0.0	(Cc.)
ST17MSR1-6	72	111	0.6	0.05	0.00	0.02	0.00	0.18	0.01	0.58	323.9	55.3	158.3	2.7	169.1	4.9	157.6	61.3	157.6	2.7	157.6	4.6	157.6	2.7	0.0	(Cc.)
ST17MSR1-7	398	184	2.1	0.12	0.00	0.33	0.00	5.25	0.08	0.93	1898.0	10.9	1827.2	23.7	1859.8	13.5	1818.0	11.5	1818.0	23.5	1818.0	13.7	1818.0	11.5	0.0	(Cc.)
ST17MSR1-8	34	31	1.1	0.11	0.00	0.35	0.01	5.55	0.14	0.93	1868.0	16.8	1946.0	39.3	1907.8	21.7	1957.9	15.8	1957.9	39.9	1957.9	21.9	1957.9	15.8	0.0	(Cc.)
ST17MSR1-9	74	117	0.6	0.11	0.00	0.26	0.00	4.20	0.07	0.92	1879.7	12.4	1513.4	21.8	1672.4	14.3	1478.0	16.2	1478.0	20.9	1478.0	14.0	1478.0	16.2	0.0	(Cc.)
ST17MSR1-10	33	58	0.6	0.11	0.00	0.32	0.01	4.97	0.10	0.93	1856.6	14.2	1779.0	29.7	1814.3	17.4	1769.5	15.0	1769.5	29.4	1769.5	17.4	1769.5	15.0	0.0	(Cc.)
ST17MSR1-11	531	675	0.8	0.05	0.00	0.01	0.00	0.08	0.00	0.66	72.9	36.8	78.0	1.1	77.8	1.6	78.1	36.7	78.1	1.1	78.1	1.6	78.1	1.1	0.0	(Cc.)
ST17MSR1-12	211	324	0.6	0.05	0.00	0.03	0.00	0.23	0.00	0.73	323.0	30.6	196.6	2.8	206.5	3.7	195.9	33.1	195.9	2.7	195.9	3.6	195.9	2.7	0.0	(Cc.)
ST17MSR1-13	89	186	0.5	0.13	0.00	0.29	0.00	5.08	0.08	0.93	2035.0	10.7	1661.5	21.8	1832.8	13.5	1617.6	14.2	1617.6	20.7	1617.6	13.2	1617.6	14.2	0.0	(Cc.)
OD-3 zircon	952	564	1.7	0.05	0.00	0.01	0.00	0.03	0.00	0.50	41.9	60.8	32.5	0.5	32.6	1.0	32.5	61.1	32.5	0.5	32.5	0.9	32.5	0.5	0.0	(Cc.)
NIST SRM 612	39	13	3.0	0.91	0.01	0.84	0.03	105.90	3.50	0.99	5113.4	6.9	3926.4	95.4	4742.9	32.9	2244.6	54.7	2244.6	30.8	2244.6	32.2	2244.6	54.7	0.0	(Cc.)
NIST SRM 612	34	12	2.8	0.91	0.01	0.89	0.03	110.94	3.84	0.99	5098.7	6.9	4096.2	103.1	4789.6	34.5	5089.9	7.0	5090.0	163.0	5089.9	47.1	5089.9	7.0	0.0	(Cc.)
NIST SRM 612	37	12	3.2	0.90	0.01	0.89	0.03	110.65	3.86	0.99	5097.9	6.9	4089.8	103.7	4787.0	34.7	5089.4	7.0	5089.0	165.0	5089.4	47.5	5089.4	7.0	0.0	(Cc.)
91500 zircon	40	88	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.87	1145.4	19.0	1048.4	16.7	1079.8	13.2	1044.0	20.3	1044.0	16.6	1044.0	13.0	1044.0	20.3	0.0	(Cc.)
91500 zircon	52	106	0.5	0.08	0.00	0.18	0.00	1.86	0.04	0.88	1086.4	18.1	1055.1	16.1	1064.8	12.4	1053.7	18.5	1053.7	16.1	1053.7	12.4	1053.7	18.5	0.0	(Cc.)
91500 zircon	49	99	0.5	0.07	0.00	0.18	0.00	1.83	0.04	0.87	1061.3	18.8	1052.8	16.3	1055.0	12.6	1052.4	18.9	1052.4	16.4	1052.4	12.6	1052.4	18.9	0.0	(Cc.)
NIST SRM 612	38	13	2.9	0.91	0.01	0.85	0.03	106.66	3.56	0.91	5109.3	19.3	3956.0	89.5	4746.6	31.3										

NIST SRM 612	32	11	2.8	0.90	0.01	0.90	0.03	111.73	3.91	0.92	5094.5	19.4	4126.8	97.3	4793.3	33.0										
NIST SRM 612	35	11	3.1	0.90	0.01	0.89	0.03	111.44	3.92	0.92	5093.8	19.4	4120.4	98.0	4790.6	33.2										
91500 zircon	39	85	0.4	0.08	0.00	0.18	0.00	1.91	0.04	0.62	1139.6	31.7	1058.2	12.3	1082.2	11.3	1054.5	33.5	1054.5	12.2	1054.5	13.7	1054.5	33.5	0.0	(Cc.)
91500 zircon	50	103	0.5	0.08	0.00	0.18	0.00	1.87	0.04	0.60	1080.6	31.4	1065.0	11.4	1067.2	10.5	1064.2	31.7	1064.2	11.4	1064.2	12.9	1064.2	31.7	0.0	(Cc.)
91500 zircon	47	96	0.5	0.07	0.00	0.18	0.00	1.84	0.04	0.60	1055.4	31.9	1062.6	11.7	1057.3	10.8	1062.9	31.7	1062.9	11.8	1062.9	13.0	1062.9	31.7	0.0	(Cc.)
GJ-1 zircon	40	534	0.1	0.06	0.00	0.10	0.00	0.81	0.01	0.40	620.2	31.6	598.5	3.6	601.1	5.0	598.1	32.1	598.1	3.6	598.1	7.3	598.1	3.6	0.0	(Cc.)
ST17MSR1-14	350	173	2.0	0.05	0.00	0.03	0.00	0.19	0.00	0.41	275.3	52.4	171.3	1.8	177.8	3.8	170.8	55.9	170.8	1.8	170.8	4.1	170.8	1.8	0.0	(Cc.)
ST17MSR1-15	49	40	1.2	0.05	0.00	0.04	0.00	0.28	0.01	0.49	142.2	80.8	260.8	4.9	248.3	8.7	262.4	75.1	262.4	5.0	262.4	8.8	262.4	5.0	0.0	(Cc.)
ST17MSR1-16	158	112	1.4	0.06	0.00	0.02	0.00	0.21	0.01	0.44	646.4	55.0	158.5	2.0	192.7	4.8	156.1	74.5	156.1	1.9	156.1	5.0	156.1	1.9	0.0	(Cc.)
ST17MSR1-17	278	129	2.1	0.12	0.00	0.33	0.00	5.20	0.09	0.59	1895.9	25.7	1815.3	16.5	1849.4	11.4	1805.0	27.3	1805.0	16.3	1805.0	15.4	1805.0	27.3	0.0	(Cc.)
ST17MSR1-18	636	693	0.9	0.05	0.00	0.01	0.00	0.08	0.00	0.33	57.5	46.7	81.2	0.6	80.1	1.4	81.2	46.1	81.2	0.6	81.2	1.6	81.2	0.6	0.0	(Cc.)
ST17MSR1-19	45	199	0.2	0.05	0.00	0.03	0.00	0.19	0.00	0.41	340.4	49.9	162.7	1.6	173.9	3.5	161.8	55.7	161.8	1.6	161.8	3.9	161.8	1.6	0.0	(Cc.)
ST17MSR1-20	343	144	2.4	0.06	0.00	0.07	0.00	0.56	0.01	0.50	491.2	39.8	442.9	4.4	449.2	6.5	442.2	41.1	442.2	4.4	442.2	7.6	442.2	4.4	0.0	(Cc.)
ST17MSR1-21	385	438	0.9	0.05	0.00	0.03	0.00	0.18	0.00	0.37	156.0	42.7	166.2	1.2	164.8	2.5	166.2	42.5	166.2	1.2	166.2	3.0	166.2	1.2	0.0	(Cc.)
ST17MSR1-22	201	95	2.1	0.05	0.00	0.03	0.00	0.19	0.01	0.43	255.3	65.8	167.1	2.2	172.4	4.9	166.7	69.4	166.7	2.3	166.7	5.0	166.7	2.3	0.0	(Cc.)
ST17MSR1-23	208	130	1.6	0.05	0.00	0.06	0.00	0.49	0.01	0.50	414.5	42.6	403.1	4.3	403.3	6.4	402.9	42.9	402.9	4.2	402.9	7.3	402.9	4.2	0.0	(Cc.)
ST17MSR1-24	215	291	0.7	0.05	0.00	0.01	0.00	0.08	0.00	0.35	161.0	60.0	76.9	0.7	79.2	2.0	76.7	63.2	76.7	0.7	76.7	2.1	76.7	0.7	0.0	(Cc.)
ST17MSR1-25	51	60	0.8	0.05	0.00	0.02	0.00	0.14	0.01	0.41	196.2	91.0	127.1	2.2	130.1	5.3	126.8	95.0	126.8	2.2	126.8	5.2	126.8	2.2	0.0	(Cc.)
ST17MSR1-26	403	559	0.7	0.15	0.00	0.43	0.00	9.13	0.14	0.41	2404.0	23.5	2291.2	11.9	2347.4	8.8	2264.8	25.9	2264.8	11.6	2264.8	14.7	2264.8	25.9	0.0	(Cc.)
OD-3 zircon	373	281	1.3	0.05	0.00	0.01	0.00	0.04	0.00	0.31	224.5	83.4	32.8	0.4	35.4	1.3	32.6	93.7	32.6	0.4	32.6	1.3	32.6	0.4	0.0	(Cc.)
NIST SRM 612	42	14	3.0	0.91	0.01	0.84	0.02	105.23	3.40	0.91	5107.9	19.3	3919.1	85.4	4733.0	30.2										
NIST SRM 612	42	12	3.3	0.92	0.01	0.89	0.03	112.35	3.78	0.91	5119.5	19.3	4089.8	92.5	4798.9	31.6										
NIST SRM 612	35	12	2.8	0.91	0.01	0.84	0.03	105.81	3.57	0.91	5113.1	19.3	3924.5	90.1	4738.6	31.7										
91500 zircon	50	106	0.5	0.08	0.00	0.18	0.00	1.87	0.04	0.59	1093.5	31.2	1058.8	11.2	1067.3	10.4	1057.2	32.0	1057.2	11.1	1057.2	12.8	1057.2	32.0	0.0	(Cc.)
91500 zircon	51	107	0.5	0.07	0.00	0.18	0.00	1.84	0.04	0.59	1048.0	31.5	1064.8	11.2	1056.4	10.3	1065.6	31.1	1065.6	11.2	1065.6	12.7	1065.6	31.1	0.0	(Cc.)
91500 zircon	51	98	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.60	1082.2	31.6	1068.9	11.7	1070.4	10.7	1068.3	31.9	1068.3	11.7	1068.3	13.1	1068.3	31.9	0.0	(Cc.)
NIST SRM 612	41	14	3.0	0.91	0.01	0.84	0.03	105.94	3.25	0.98	5116.4	7.7	3921.1	88.1	4732.8	31.0	2240.1	60.9	2240.1	28.4	2240.1	34.6	2240.1	60.9	0.0	(Cc.)
NIST SRM 612	41	12	3.3	0.91	0.01	0.89	0.03	113.10	3.63	0.99	5128.0	7.6	4091.8	95.1	4798.6	32.4	2289.0	59.1	2289.0	29.3	2289.0	34.2	2289.0	59.1	0.0	(Cc.)
NIST SRM 612	34	12	2.7	0.91	0.01	0.84	0.03	106.52	3.43	0.99	5121.6	7.6	3926.5	92.7	4738.3	32.5	2237.4	60.9	2237.4	29.7	2237.4	34.8	2237.4	60.9	0.0	(Cc.)
91500 zircon	50	106	0.5	0.08	0.00	0.18	0.00	1.88	0.03	0.83	1105.5	18.4	1059.5	13.3	1067.2	11.4	1057.4	19.0	1057.4	13.2	1057.4	10.9	1057.4	19.0	0.0	(Cc.)
91500 zircon	51	106	0.5	0.07	0.00	0.18	0.00	1.85	0.03	0.83	1060.1	18.6	1065.5	13.4	1056.3	11.3	1065.7	18.6	1065.7	13.4	1065.7	10.9	1065.7	18.6	0.0	(Cc.)
91500 zircon	51	97	0.5	0.08	0.00	0.18	0.00	1.89	0.03	0.83	1094.3	19.0	1069.5	13.8	1070.2	11.7	1068.4	19.3	1068.4	13.7	1068.4	11.2	1068.4	19.3	0.0	(Cc.)

GJ-1 zircon	39	540	0.1	0.06	0.00	0.10	0.00	0.82	0.01	0.79	641.0	16.1	598.2	5.6	602.1	6.0	597.4	16.5	597.4	5.6	597.4	5.6	597.4	5.6	0.0	(Ce.)
ST17MSR1-27	73	53	1.4	0.60	0.01	0.07	0.00	5.72	0.11	0.94	4517.3	9.1	428.5	7.4	1925.1	17.9	132.0	183.0	132.4	0.7	132.4	9.7	132.4	0.7	0.0	(Ce.)
ST17MSR1-28	51	52	1.0	0.11	0.00	0.31	0.01	4.70	0.09	0.90	1791.9	15.5	1747.6	26.3	1758.4	16.6	1742.4	16.0	1742.4	26.1	1742.4	16.0	1742.4	16.0	0.0	(Ce.)
ST17MSR1-29	77	73	1.0	0.05	0.00	0.02	0.00	0.15	0.01	0.47	168.7	76.7	136.8	2.3	137.1	5.0	136.6	78.3	136.6	2.3	136.6	4.8	136.6	2.3	0.0	(Ce.)
ST17MSR1-30	67	103	0.6	0.05	0.00	0.03	0.00	0.20	0.01	0.53	375.6	53.7	170.6	2.5	183.3	5.0	169.6	60.9	169.6	2.5	169.6	4.7	169.6	2.5	0.0	(Ce.)
ST17MSR1-31	130	88	1.4	0.05	0.00	0.04	0.00	0.27	0.01	0.57	363.0	50.3	229.5	3.5	239.3	6.1	228.6	54.7	228.6	3.5	228.6	5.8	228.6	3.5	0.0	(Ce.)
ST17MSR1-32	143	193	0.7	0.05	0.00	0.03	0.00	0.19	0.00	0.56	265.2	42.0	169.9	2.1	174.7	3.8	169.5	44.5	169.5	2.1	169.5	3.5	169.5	2.1	0.0	(Ce.)
ST17MSR1-33	81	69	1.2	0.05	0.00	0.03	0.00	0.18	0.01	0.49	29.8	74.1	173.2	2.9	162.1	5.6	177.1	67.7	177.1	3.1	177.1	5.5	177.1	3.1	0.0	(Ce.)
ST17MSR1-34	310	222	1.4	0.05	0.00	0.05	0.00	0.40	0.01	0.68	341.2	28.3	340.6	3.8	337.4	5.2	340.6	28.3	340.6	3.9	340.6	4.9	340.6	3.9	0.0	(Ce.)
ST17MSR1-35	355	211	1.7	0.05	0.00	0.04	0.00	0.28	0.01	0.62	277.9	33.9	249.1	2.9	249.4	4.4	248.9	34.5	248.9	2.9	248.9	4.2	248.9	2.9	0.0	(Ce.)
ST17MSR1-36	154	160	1.0	0.05	0.00	0.05	0.00	0.39	0.01	0.66	392.8	32.3	326.7	4.0	331.8	5.7	326.1	33.7	326.1	4.0	326.1	5.4	326.1	4.0	0.0	(Ce.)
ST17MSR1-37	167	122	1.4	0.05	0.00	0.03	0.00	0.20	0.01	0.54	330.9	50.4	170.6	2.4	180.0	4.6	169.9	55.7	169.9	2.4	169.9	4.3	169.9	2.4	0.0	(Ce.)
ST17MSR1-38	569	292	1.9	0.06	0.00	0.03	0.00	0.21	0.00	0.61	469.1	32.1	173.2	1.9	193.2	3.4	171.8	38.5	171.8	1.9	171.8	3.2	171.8	1.9	0.0	(Ce.)
ST17MSR1-39	207	251	0.8	0.05	0.00	0.01	0.00	0.08	0.00	0.47	275.0	54.2	75.2	0.9	80.8	2.2	74.8	61.2	74.8	1.0	74.8	2.1	74.8	1.0	0.0	(Ce.)
OD-3 zircon	491	349	1.4	0.05	0.00	0.01	0.00	0.04	0.00	0.39	166.8	71.2	33.3	0.4	34.9	1.2	33.3	77.3	33.3	0.5	33.3	1.1	33.3	0.5	0.0	(Ce.)
NIST SRM 612	38	13	2.9	0.90	0.01	0.85	0.03	106.75	3.35	0.99	5099.5	7.7	3979.0	91.2	4740.5	31.7	5089.6	7.7	5090.0	153.0	5089.6	44.3	5089.6	7.7	0.0	(Ce.)
NIST SRM 612	31	11	2.8	0.91	0.01	0.87	0.03	110.73	3.77	0.99	5119.8	7.6	4045.5	100.2	4777.3	34.3	2280.7	59.1	2280.7	31.4	2280.7	34.5	2280.7	59.1	0.0	(Ce.)
NIST SRM 612	38	12	3.3	0.90	0.01	0.90	0.03	113.89	3.76	0.99	5111.6	7.6	4148.4	99.0	4805.6	33.3	2324.3	57.1	2324.3	30.6	2324.3	33.6	2324.3	57.1	0.0	(Ce.)
91500 zircon	51	102	0.5	0.07	0.00	0.18	0.00	1.84	0.03	0.83	1085.3	18.8	1047.9	13.3	1052.6	11.4	1046.1	19.3	1046.1	13.3	1046.1	10.9	1046.1	19.3	0.0	(Ce.)
91500 zircon	51	104	0.5	0.07	0.00	0.18	0.00	1.88	0.03	0.83	1085.9	18.6	1066.1	13.4	1065.1	11.4	1065.1	18.9	1065.1	13.4	1065.1	10.9	1065.1	18.9	0.0	(Ce.)
91500 zircon	44	94	0.5	0.07	0.00	0.18	0.00	1.87	0.03	0.83	1069.2	19.3	1069.8	13.9	1062.2	11.7	1069.9	19.3	1069.9	13.9	1069.9	11.3	1069.9	19.3	0.0	(Ce.)
NIST SRM 612	40	14	2.8	0.90	0.01	0.85	0.03	106.53	3.62	0.99	5105.9	6.1	3959.4	98.8	4739.8	34.0	2263.1	47.7	2263.1	31.9	2263.1	29.3	2263.1	47.7	0.0	(Ce.)
NIST SRM 612	33	12	2.8	0.92	0.01	0.87	0.03	110.50	4.02	0.99	5126.2	6.1	4025.6	107.3	4776.6	36.4	2267.9	47.8	2267.9	33.6	2267.9	29.7	2267.9	47.8	0.0	(Ce.)
NIST SRM 612	41	13	3.2	0.91	0.01	0.90	0.03	113.65	4.03	0.99	5117.9	6.1	4128.2	106.5	4804.9	35.5	2311.1	46.2	2311.1	32.9	2311.1	29.0	2311.1	46.2	0.0	(Ce.)
91500 zircon	54	112	0.5	0.08	0.00	0.18	0.00	1.84	0.04	0.91	1094.3	17.7	1041.5	18.4	1052.2	14.0	1039.1	18.3	1039.1	18.3	1039.1	13.8	1039.1	18.3	0.0	(Ce.)
91500 zircon	55	114	0.5	0.08	0.00	0.18	0.00	1.87	0.04	0.91	1095.0	17.4	1059.6	18.6	1064.7	14.0	1057.9	17.8	1057.9	18.6	1057.9	13.8	1057.9	17.8	0.0	(Ce.)
91500 zircon	47	104	0.5	0.07	0.00	0.18	0.00	1.86	0.04	0.91	1078.4	18.1	1063.3	19.0	1061.8	14.3	1062.6	18.3	1062.6	19.0	1062.6	14.1	1062.6	18.3	0.0	(Ce.)
GJ-1 zircon	45	602	0.1	0.06	0.00	0.10	0.00	0.82	0.01	0.93	644.9	14.4	596.8	9.4	602.4	8.2	595.8	14.9	595.9	9.4	595.9	8.0	595.9	9.4	0.0	(Ce.)
ST17MSR1-40	33	218	0.1	0.09	0.00	0.02	0.00	0.32	0.01	0.80	1510.1	25.8	155.3	2.8	276.7	5.8	146.6	61.6	146.6	2.5	146.6	4.3	146.6	2.5	0.0	(Ce.)
ST17MSR1-41	1929	864	2.2	0.06	0.00	0.02	0.00	0.19	0.00	0.86	491.4	21.3	155.0	2.5	176.1	3.2	153.5	26.3	153.5	2.5	153.5	2.8	153.5	2.5	0.0	(Ce.)
ST17MSR1-42	187	179	1.0	0.08	0.00	0.05	0.00	0.55	0.01	0.84	1098.4	23.7	330.1	5.9	442.4	8.0	320.8	38.7	320.8	5.6	320.8	6.8	320.8	5.6	0.0	(Ce.)
ST17MSR1-43	56	72	0.8	0.11	0.00	0.31	0.01	4.54	0.10	0.94	1754.9	13.5	1723.5	31.2	1729.5	18.4	1719.9	13.9	1719.9	31.2	1719.9	18.2	1719.9	13.9	0.0	(Ce.)

ST17MSR1-44	87	120	0.7	0.05	0.00	0.03	0.00	0.18	0.01	0.63	95.9	58.1	168.5	3.3	162.3	4.9	169.1	55.6	169.1	3.3	169.1	4.8	169.1	3.3	0.0	(Cc.)
ST17MSR1-45	151	201	0.7	0.05	0.00	0.02	0.00	0.15	0.00	0.67	288.8	47.2	132.9	2.4	140.2	3.8	132.3	51.9	132.3	2.4	132.3	3.6	132.3	2.4	0.0	(Cc.)
ST17MSR1-46	338	368	0.9	0.05	0.00	0.03	0.00	0.18	0.00	0.77	210.0	33.1	165.9	2.8	167.3	3.6	165.7	34.0	165.7	2.8	165.7	3.4	165.7	2.8	0.0	(Cc.)
ST17MSR1-47	292	488	0.6	0.05	0.00	0.01	0.00	0.08	0.00	0.69	110.9	42.3	80.4	1.4	80.6	2.0	80.3	43.1	80.3	1.4	80.3	1.9	80.3	1.4	0.0	(Cc.)
ST17MSR1-48	192	218	0.9	0.05	0.00	0.02	0.00	0.13	0.00	0.65	223.7	49.4	117.6	2.1	121.6	3.4	117.3	52.7	117.3	2.1	117.3	3.2	117.3	2.1	0.0	(Cc.)
ST17MSR1-49	83	153	0.5	0.05	0.00	0.04	0.00	0.24	0.01	0.71	224.3	43.1	222.2	4.1	220.4	5.4	222.2	43.1	222.2	4.1	222.2	5.3	222.2	4.1	0.0	(Cc.)
ST17MSR1-50	93	107	0.9	0.05	0.00	0.03	0.00	0.19	0.01	0.63	300.3	56.6	168.6	3.4	176.1	5.4	168.0	61.3	168.0	3.4	168.0	5.1	168.0	3.4	0.0	(Cc.)
ST17MSR1-51	281	196	1.4	0.05	0.00	0.03	0.00	0.17	0.00	0.68	172.4	45.9	159.7	2.9	159.0	4.1	159.6	46.2	159.6	2.9	159.6	4.0	159.6	2.9	0.0	(Cc.)
ST17MSR1-52	117	192	0.6	0.17	0.00	0.48	0.01	11.20	0.21	0.96	2560.1	8.4	2513.8	36.8	2530.3	17.3	2499.7	8.8	2499.7	36.6	2499.7	17.1	2499.7	8.8	0.0	(Cc.)
OD-3 zircon	1108	620	1.8	0.05	0.00	0.01	0.00	0.03	0.00	0.58	90.2	58.4	32.9	0.6	33.3	1.0	32.8	60.5	32.8	0.6	32.8	1.0	32.8	0.6	0.0	(Cc.)
NIST SRM 612	26	9	3.0	0.91	0.01	0.84	0.03	105.51	4.37	0.99	5113.6	5.9	3915.0	119.9	4730.1	41.3	2240.4	46.9	2240.4	38.8	2240.4	30.8	2240.4	46.9	0.0	(Cc.)
NIST SRM 612	43	14	3.1	0.91	0.01	0.87	0.03	109.45	3.78	0.99	5113.1	6.1	4024.8	101.7	4767.1	34.5	2279.7	47.3	2279.7	32.2	2279.7	29.2	2279.7	47.3	0.0	(Cc.)
NIST SRM 612	40	12	3.2	0.90	0.01	0.90	0.03	113.64	4.06	0.99	5108.1	6.1	4149.4	107.7	4804.9	35.7	2328.0	45.4	2328.0	33.4	2328.0	28.8	2328.0	45.4	0.0	(Cc.)
91500 zircon	38	79	0.5	0.07	0.00	0.18	0.00	1.89	0.04	0.90	1076.6	20.0	1077.3	20.2	1070.6	15.2	1077.4	20.0	1077.4	20.2	1077.4	15.0	1077.4	20.0	0.0	(Cc.)
91500 zircon	35	78	0.4	0.07	0.00	0.18	0.00	1.83	0.04	0.90	1066.1	20.4	1053.1	19.8	1050.9	15.2	1052.5	20.6	1052.5	19.9	1052.5	15.0	1052.5	20.6	0.0	(Cc.)
91500 zircon	51	102	0.5	0.08	0.00	0.18	0.00	1.91	0.04	0.91	1090.2	18.0	1083.4	19.3	1079.1	14.4	1083.1	18.1	1083.1	19.4	1083.1	14.3	1083.1	18.1	0.0	(Cc.)
NIST SRM 612	42	13	3.1	0.91	0.01	0.84	0.03	106.11	3.62	0.99	5117.4	7.4	3923.8	98.2	4737.2	34.7	2240.2	59.3	2240.2	31.6	2240.2	34.4	2240.2	59.3	0.0	(Cc.)
NIST SRM 612	31	10	3.1	0.92	0.01	0.88	0.03	112.62	4.30	0.99	5132.2	7.3	4069.9	113.1	4797.2	38.7	2277.6	57.6	2277.6	34.9	2277.6	34.5	2277.6	57.6	0.0	(Cc.)
NIST SRM 612	33	11	3.1	0.90	0.01	0.87	0.03	108.95	4.08	0.99	5102.4	7.4	4033.8	110.1	4763.8	37.9	2292.7	56.1	2292.7	35.1	2292.7	34.0	2292.7	56.1	0.0	(Cc.)
91500 zircon	38	76	0.5	0.08	0.00	0.17	0.00	1.83	0.04	0.89	1098.1	20.6	1034.9	19.7	1049.9	15.9	1032.1	21.5	1032.1	19.7	1032.1	15.0	1032.1	21.5	0.0	(Cc.)
91500 zircon	41	74	0.5	0.08	0.00	0.18	0.00	1.91	0.04	0.90	1105.6	20.5	1076.3	20.6	1080.4	16.2	1075.0	20.9	1075.0	20.6	1075.0	15.4	1075.0	20.9	0.0	(Cc.)
91500 zircon	52	100	0.5	0.07	0.00	0.18	0.00	1.84	0.04	0.90	1068.3	18.8	1053.8	19.1	1052.9	15.1	1053.1	19.0	1053.1	19.1	1053.1	14.3	1053.1	19.0	0.0	(Cc.)
GJ-1 zircon	11	131	0.1	0.06	0.00	0.10	0.00	0.80	0.02	0.86	622.9	25.0	592.6	10.8	595.1	10.7	592.0	25.4	592.0	10.8	592.0	10.1	592.0	10.8	0.0	(Cc.)
ST17MSR1-53	35	45	0.8	0.05	0.00	0.01	0.00	0.08	0.01	0.44	303.0	127.0	72.4	2.0	79.0	5.0	71.9	145.8	71.9	2.0	71.9	4.7	<u>71.9*</u>	<u>2.0*</u>	0.0	(Cc.)
ST17MSR1-54	455	367	1.2	0.06	0.00	0.02	0.00	0.20	0.00	0.80	671.3	28.3	152.9	2.7	187.8	4.1	150.4	39.1	150.4	2.6	150.4	3.4	150.4	2.6	0.0	(Cc.)
ST17MSR1-55	71	68	1.0	0.05	0.00	0.03	0.00	0.17	0.01	0.58	108.9	74.4	162.9	3.6	158.2	6.0	163.2	71.9	163.2	3.6	163.2	5.7	163.2	3.6	0.0	(Cc.)
ST17MSR1-56	121	124	1.0	0.41	0.01	0.03	0.00	1.97	0.04	0.94	3967.8	10.8	217.7	4.2	1099.5	15.5	118.0	146.0	117.9	1.2	117.9	7.0	117.9	1.2	0.0	(Cc.)
ST17MSR1-57	84	311	0.3	0.19	0.00	0.50	0.01	13.00	0.24	0.95	2728.6	9.3	2615.4	37.5	2671.7	18.4	2575.1	10.3	2575.1	36.4	2575.1	17.0	2575.1	10.3	0.0	(Cc.)
ST17MSR1-58	146	204	0.7	0.06	0.00	0.02	0.00	0.17	0.00	0.71	713.8	39.9	122.0	2.3	155.1	4.1	119.8	57.7	119.8	2.2	119.8	3.5	119.8	2.2	0.0	(Cc.)
ST17MSR1-59	260	406	0.6	0.05	0.00	0.01	0.00	0.08	0.00	0.67	140.9	46.5	72.7	1.3	74.1	2.0	72.5	48.5	72.5	1.3	72.5	1.9	72.5	1.3	0.0	(Cc.)
ST17MSR1-60	213	131	1.6	0.05	0.00	0.04	0.00	0.28	0.01	0.73	287.9	41.7	247.0	4.7	249.1	6.3	246.8	42.8	246.8	4.7	246.8	5.9	246.8	4.7	0.0	(Cc.)
ST17MSR1-61	93	542	0.2	0.16	0.00	0.34	0.01	7.65	0.14	0.95	2469.5	9.5	1906.1	28.0	2183.4	17.2	1809.4	14.9	1809.4	25.3	1809.4	15.2	1809.4	14.9	0.0	(Cc.)

ST17MSR1-62	138	141	1.0	0.05	0.00	0.02	0.00	0.16	0.00	0.65	140.0	53.1	155.7	3.0	153.5	4.5	155.8	52.6	155.8	3.0	155.8	4.3	155.8	3.0	0.0	(Cc.)
ST17MSR1-63	215	111	1.9	0.06	0.00	0.02	0.00	0.22	0.01	0.68	772.3	46.0	156.7	3.1	200.7	5.8	153.6	67.7	153.7	3.0	153.7	5.0	153.7	3.0	0.0	(Cc.)
ST17MSR1-64	75	80	0.9	0.05	0.00	0.03	0.00	0.18	0.01	0.60	223.9	66.0	163.0	3.5	165.7	5.8	162.7	68.5	162.8	3.5	162.8	5.5	162.8	3.5	0.0	(Cc.)
ST17MSR1-65	18	35	0.5	0.20	0.01	0.02	0.00	0.43	0.02	0.75	2802.9	41.0	100.0	2.8	357.2	13.1	81.3	246.6	81.3	1.8	81.3	8.3	81.3	1.8	0.0	(Cc.)
OD-3 zircon	2106	946	2.2	0.05	0.00	0.01	0.00	0.03	0.00	0.66	0.0	46.8	33.4	0.6	32.3	0.9	33.4	46.3	33.4	0.6	33.4	0.9	33.4	0.6	0.0	(Cc.)
NIST SRM 612	38	12	3.1	0.90	0.01	0.86	0.03	107.84	3.80	0.99	5095.5	7.4	4017.7	103.3	4753.5	35.8	5087.6	7.5	5088.0	170.0	5087.6	49.1	5087.6	7.5	0.0	(Cc.)
NIST SRM 612	41	14	2.9	0.91	0.01	0.86	0.03	107.91	3.63	0.99	5112.1	7.4	3984.6	97.9	4754.2	34.3	2266.5	57.9	2266.5	31.2	2266.5	33.9	2266.5	57.9	0.0	(Cc.)
NIST SRM 612	38	13	2.8	0.91	0.01	0.87	0.03	109.86	3.74	0.99	5113.2	7.4	4035.6	100.1	4772.2	34.7	2283.4	57.3	2283.4	31.6	2283.4	33.7	2283.4	57.3	0.0	(Cc.)
91500 zircon	41	89	0.5	0.07	0.00	0.18	0.00	1.87	0.04	0.90	1083.8	19.4	1066.1	19.7	1066.3	15.6	1065.2	19.7	1065.2	19.7	1065.2	14.7	1065.2	19.7	0.0	(Cc.)
91500 zircon	52	98	0.5	0.07	0.00	0.18	0.00	1.89	0.04	0.90	1078.8	18.8	1075.5	19.6	1071.0	15.3	1075.4	18.8	1075.4	19.6	1075.4	14.5	1075.4	18.8	0.0	(Cc.)
91500 zircon	49	104	0.5	0.07	0.00	0.18	0.00	1.87	0.04	0.91	1065.8	18.5	1071.5	19.3	1064.0	15.1	1071.8	18.5	1071.8	19.4	1071.8	14.3	1071.8	18.5	0.0	(Cc.)
NIST SRM 612	36	11	3.1	0.90	0.01	0.86	0.03	107.86	3.68	0.97	5097.4	11.3	4014.3	98.4	4753.7	33.6	5088.6	11.4	5089.0	162.0	5088.6	47.3	5088.6	11.4	0.0	(Cc.)
NIST SRM 612	39	13	3.0	0.91	0.01	0.85	0.03	107.93	3.51	0.97	5114.0	11.3	3981.2	92.8	4754.3	31.9	5097.4	11.5	5097.0	156.0	5097.4	45.5	5097.4	11.5	0.0	(Cc.)
NIST SRM 612	36	12	2.9	0.91	0.01	0.87	0.03	109.88	3.62	0.97	5115.2	11.3	4032.1	95.0	4772.4	32.4	5098.6	11.5	5099.0	156.0	5098.6	45.4	5098.6	11.5	0.0	(Cc.)
91500 zircon	38	82	0.5	0.08	0.00	0.18	0.00	1.87	0.04	0.83	1086.6	22.9	1064.9	16.8	1066.4	13.2	1063.9	23.2	1063.9	16.8	1063.9	13.6	1063.9	23.2	0.0	(Cc.)
91500 zircon	49	90	0.5	0.07	0.00	0.18	0.00	1.89	0.04	0.83	1081.5	22.4	1074.4	16.6	1071.1	12.9	1074.1	22.5	1074.1	16.6	1074.1	13.3	1074.1	22.5	0.0	(Cc.)
91500 zircon	46	96	0.5	0.07	0.00	0.18	0.00	1.87	0.04	0.83	1068.5	22.2	1070.4	16.3	1064.2	12.7	1070.4	22.1	1070.4	16.3	1070.4	13.1	1070.4	22.1	0.0	(Cc.)
GJ-1 zircon	31	408	0.1	0.06	0.00	0.10	0.00	0.81	0.01	0.81	617.4	21.2	598.7	7.8	598.8	7.2	598.4	21.5	598.4	7.7	598.4	7.6	598.4	7.7	0.0	(Cc.)
ST17MSR1-66	187	214	0.9	0.05	0.00	0.01	0.00	0.08	0.00	0.51	68.7	62.3	75.8	1.2	75.0	2.3	75.8	62.1	75.8	1.2	75.8	2.2	75.8	1.2	0.0	(Cc.)
ST17MSR1-67	72	86	0.8	0.06	0.00	0.05	0.00	0.43	0.01	0.69	590.9	39.8	331.1	5.6	363.1	7.8	328.5	46.9	328.5	5.5	328.5	7.6	328.5	5.5	0.0	(Cc.)
ST17MSR1-68	98	142	0.7	0.05	0.00	0.03	0.00	0.20	0.01	0.61	208.2	48.4	179.7	2.8	180.3	4.4	179.5	49.3	179.5	2.8	179.5	4.4	179.5	2.8	0.0	(Cc.)
ST17MSR1-69	348	277	1.2	0.05	0.00	0.03	0.00	0.17	0.00	0.65	172.5	39.0	161.8	2.3	161.2	3.3	161.8	39.3	161.8	2.3	161.8	3.3	161.8	2.3	0.0	(Cc.)
ST17MSR1-70	87	73	1.2	0.05	0.00	0.02	0.00	0.16	0.01	0.53	130.5	71.5	156.6	2.9	153.8	5.3	156.7	70.4	156.7	3.0	156.7	5.2	156.7	3.0	0.0	(Cc.)
ST17MSR1-71	473	471	1.0	0.05	0.00	0.04	0.00	0.27	0.00	0.75	223.5	28.1	242.3	3.2	238.7	3.7	242.4	27.7	242.4	3.2	242.4	3.9	242.4	3.2	0.0	(Cc.)
ST17MSR1-72	24	71	0.3	0.08	0.00	0.01	0.00	0.14	0.01	0.54	1309.8	62.9	76.6	1.6	131.7	5.1	73.0	137.6	73.0	1.5	73.0	4.3	73.0	1.5	0.0	(Cc.)
ST17MSR1-73	211	232	0.9	0.10	0.00	0.01	0.00	0.16	0.00	0.65	1554.6	33.9	77.3	1.2	149.7	3.4	72.5	87.1	72.5	1.1	72.5	2.8	72.5	1.1	0.0	(Cc.)
ST17MSR1-74	160	333	0.5	0.05	0.00	0.01	0.00	0.07	0.00	0.56	53.9	52.5	73.1	1.1	71.9	1.9	73.1	51.9	73.1	1.1	73.1	1.9	73.1	1.1	0.0	(Cc.)
ST17MSR1-75	684	646	1.0	0.05	0.00	0.02	0.00	0.16	0.00	0.72	170.2	29.9	151.2	2.0	151.1	2.5	151.1	30.2	151.1	2.0	151.1	2.6	151.1	2.0	0.0	(Cc.)
ST17MSR1-76	621	391	1.6	0.05	0.00	0.02	0.00	0.16	0.00	0.68	147.7	35.3	155.2	2.1	153.5	2.9	155.2	35.1	155.3	2.1	155.3	3.0	155.3	2.1	0.0	(Cc.)
ST17MSR1-77	117	112	1.0	0.05	0.00	0.02	0.00	0.17	0.01	0.57	291.3	55.6	153.9	2.6	161.3	4.5	153.3	60.6	153.3	2.6	153.3	4.4	153.3	2.6	0.0	(Cc.)
ST17MSR1-78	378	303	1.2	0.05	0.00	0.03	0.00	0.18	0.00	0.67	205.3	36.7	169.4	2.4	170.5	3.3	169.3	37.5	169.3	2.4	169.3	3.4	169.3	2.4	0.0	(Cc.)
OD-3 zircon	482	267	1.8	0.05	0.00	0.01	0.00	0.03	0.00	0.43	46.2	83.0	33.6	0.6	33.5	1.3	33.6	83.6	33.6	0.6	33.6	1.3	33.6	0.6	0.0	(Cc.)

NIST SRM 612	39	12	3.1	0.91	0.01	0.85	0.03	106.49	3.50	0.97	5110.1	11.3	3949.7	93.4	4740.9	32.3	5095.0	11.5	5095.0	160.0	5095.0	46.5	5095.0	11.5	0.0	(Cc.)
NIST SRM 612	38	12	3.1	0.91	0.01	0.84	0.03	106.58	3.53	0.97	5115.7	11.3	3940.4	94.2	4741.7	32.6	5097.9	11.5	5098.0	162.0	5097.9	47.1	5097.9	11.5	0.0	(Cc.)
NIST SRM 612	35	13	2.7	0.91	0.01	0.74	0.02	94.42	3.09	0.97	5120.8	11.3	3584.8	86.7	4619.8	32.2	5096.8	11.5	5097.0	181.0	5096.8	52.5	5096.8	11.5	0.0	(Cc.)
91500 zircon	50	102	0.5	0.07	0.00	0.18	0.00	1.85	0.04	0.83	1071.9	21.9	1058.9	15.9	1057.6	12.4	1058.4	22.1	1058.4	15.9	1058.4	12.9	1058.4	22.1	0.0	(Cc.)
91500 zircon	48	95	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.83	1108.3	22.0	1069.2	16.3	1076.5	12.7	1067.4	22.5	1067.4	16.3	1067.4	13.2	1067.4	22.5	0.0	(Cc.)
91500 zircon	48	100	0.5	0.07	0.00	0.18	0.00	1.82	0.04	0.83	1083.4	22.0	1040.4	15.7	1048.8	12.4	1038.5	22.6	1038.5	15.7	1038.5	12.9	1038.5	22.6	0.0	(Cc.)
NIST SRM 612	38	12	3.1	0.91	0.01	0.89	0.03	112.32	4.35	0.87	5115.3	26.6	4098.1	101.6	4795.0	34.7										
NIST SRM 612	35	12	3.0	0.90	0.01	0.84	0.03	105.25	4.07	0.87	5098.6	26.7	3939.1	98.9	4729.6	34.7										
NIST SRM 612	34	11	3.0	0.90	0.01	0.89	0.03	110.74	4.38	0.88	5099.1	26.7	4089.8	104.4	4780.7	35.6										
91500 zircon	57	112	0.5	0.08	0.00	0.18	0.00	1.91	0.05	0.68	1092.1	40.2	1081.1	18.6	1079.4	14.4	1080.5	40.5	1080.5	18.6	1080.5	18.3	1080.5	40.5	0.0	(Cc.)
91500 zircon	46	99	0.5	0.07	0.00	0.18	0.00	1.79	0.05	0.68	1036.0	41.1	1043.1	18.3	1035.7	14.4	1043.4	40.9	1043.4	18.4	1043.4	18.1	1043.4	40.9	0.0	(Cc.)
91500 zircon	52	107	0.5	0.07	0.00	0.18	0.00	1.88	0.05	0.68	1076.6	40.5	1071.9	18.6	1068.2	14.4	1071.7	40.6	1071.7	18.6	1071.7	18.3	1071.7	40.6	0.0	(Cc.)
GJ-1 zircon	39	510	0.1	0.06	0.00	0.10	0.00	0.82	0.02	0.65	623.2	42.1	603.1	9.5	603.8	8.7	602.7	42.7	602.7	9.6	602.7	11.7	602.7	9.6	0.0	(Cc.)
ST17MSR1-79	2165	651	3.3	0.07	0.00	0.02	0.00	0.22	0.01	0.63	821.1	43.1	152.8	2.5	200.3	3.7	149.5	65.6	149.5	2.4	149.5	4.5	149.5	2.4	0.0	(Cc.)
ST17MSR1-80	80	75	1.1	0.06	0.00	0.05	0.00	0.49	0.02	0.63	762.0	53.1	342.6	6.8	399.7	9.4	337.8	69.2	337.9	6.7	337.8	10.5	337.9	6.7	0.0	(Cc.)
ST17MSR1-81	106	148	0.7	0.10	0.00	0.04	0.00	0.56	0.02	0.65	1585.7	40.6	262.4	4.7	449.3	8.5	247.3	95.8	247.3	4.2	247.3	9.9	247.3	4.2	0.0	(Cc.)
ST17MSR1-82	68	67	1.0	0.05	0.00	0.03	0.00	0.24	0.01	0.56	293.0	72.1	210.3	4.4	215.7	6.9	209.9	75.9	209.9	4.4	209.9	7.4	209.9	4.4	0.0	(Cc.)
ST17MSR1-83	205	179	1.1	0.12	0.00	0.34	0.01	5.51	0.14	0.68	1924.0	34.3	1883.0	28.8	1895.7	16.9	1877.3	35.4	1877.3	28.7	1877.3	22.6	1877.3	35.4	0.0	(Cc.)
ST17MSR1-84	98	131	0.7	0.05	0.00	0.03	0.00	0.20	0.01	0.57	369.7	61.7	168.7	3.2	181.5	4.9	167.7	69.9	167.7	3.1	167.7	5.5	167.7	3.1	0.0	(Cc.)
ST17MSR1-85	88	135	0.6	0.12	0.00	0.36	0.01	6.03	0.16	0.69	1998.6	34.1	1961.6	30.7	1972.7	17.6	1956.0	35.1	1956.0	30.6	1956.0	23.2	1956.0	35.1	0.0	(Cc.)
ST17MSR1-86	57	99	0.6	0.05	0.00	0.03	0.00	0.21	0.01	0.56	380.5	65.7	174.9	3.4	188.5	5.5	173.9	74.7	173.9	3.4	173.9	6.0	173.9	3.4	0.0	(Cc.)
ST17MSR1-87	15	90	0.2	0.05	0.00	0.03	0.00	0.18	0.01	0.54	105.3	74.8	169.8	3.4	164.3	5.3	170.3	71.9	170.3	3.4	170.3	5.8	170.3	3.4	0.0	(Cc.)
ST17MSR1-88	510	181	2.8	0.09	0.00	0.06	0.00	0.71	0.02	0.65	1393.3	39.9	367.1	6.4	544.3	9.2	351.5	77.7	351.5	5.9	351.5	11.4	351.5	5.9	0.0	(Cc.)
ST17MSR1-89	81	101	0.8	0.05	0.00	0.04	0.00	0.30	0.01	0.60	378.5	59.4	252.0	4.8	262.9	6.7	251.1	64.2	251.1	4.8	251.1	7.6	251.1	4.8	0.0	(Cc.)
ST17MSR1-90	192	247	0.8	0.05	0.00	0.05	0.00	0.39	0.01	0.63	374.2	48.5	329.0	5.6	332.4	6.3	328.6	49.8	328.6	5.6	328.6	7.9	328.6	5.6	0.0	(Cc.)
ST17MSR1-91	170	252	0.7	0.06	0.00	0.01	0.00	0.10	0.00	0.55	655.5	58.8	77.1	1.4	97.8	2.7	75.7	84.2	75.7	1.4	75.7	2.9	75.7	1.4	0.0	(Cc.)
OD-3 zircon	112	122	0.9	0.05	0.00	0.01	0.00	0.03	0.00	0.38	73.4	128.1	32.5	0.7	32.8	1.9	32.4	131.3	32.4	0.7	32.4	1.9	32.4	0.7	0.0	(Cc.)
NIST SRM 612	37	12	3.0	0.91	0.01	0.86	0.03	109.59	4.21	0.87	5122.8	26.6	4008.0	99.0	4770.2	34.3										
NIST SRM 612	42	13	3.1	0.90	0.01	0.85	0.03	106.39	3.99	0.86	5106.9	26.7	3953.4	95.0	4740.4	33.3										
NIST SRM 612	38	13	2.8	0.92	0.01	0.84	0.03	106.98	4.01	0.86	5125.8	26.6	3930.1	94.5	4745.9	33.3										
91500 zircon	45	95	0.5	0.08	0.00	0.18	0.00	1.85	0.05	0.69	1097.6	40.7	1049.4	18.6	1059.9	14.7	1047.2	42.0	1047.2	18.5	1047.2	18.5	1047.2	42.0	0.0	(Cc.)
91500 zircon	50	99	0.5	0.08	0.00	0.18	0.00	1.86	0.05	0.69	1092.2	40.6	1056.2	18.6	1062.8	14.6	1054.6	41.6	1054.6	18.5	1054.6	18.4	1054.6	41.6	0.0	(Cc.)

91500 zircon	44	95	0.5	0.08	0.00	0.18	0.00	1.91	0.05	0.69	1104.1	40.6	1076.5	19.0	1080.3	14.8	1075.2	41.3	1075.2	19.0	1075.2	18.7	1075.2	41.3	0.0	(Ce.)
NIST SRM 612	37	12	3.1	0.91	0.01	0.86	0.03	109.12	3.57	0.99	5113.3	6.4	4015.3	96.0	4768.5	32.7	2276.2	49.2	2276.2	30.4	2276.2	29.6	2276.2	49.2	0.0	(Ce.)
NIST SRM 612	41	13	3.2	0.90	0.01	0.85	0.03	105.94	3.35	0.99	5097.4	6.4	3960.7	92.0	4738.7	31.6	5088.3	6.4	5088.0	156.0	5088.3	45.0	5088.3	6.4	0.0	(Ce.)
NIST SRM 612	37	13	2.9	0.91	0.01	0.84	0.03	106.52	3.36	0.99	5116.4	6.4	3937.4	91.5	4744.2	31.6	2245.9	50.4	2245.9	29.4	2245.9	29.9	2245.9	50.4	0.0	(Ce.)
91500 zircon	45	92	0.5	0.08	0.00	0.18	0.00	1.85	0.04	0.89	1084.1	17.7	1051.8	16.7	1058.8	12.9	1050.3	18.0	1050.3	16.7	1050.3	12.7	1050.3	18.0	0.0	(Ce.)
91500 zircon	49	96	0.5	0.07	0.00	0.18	0.00	1.86	0.04	0.89	1078.9	17.4	1058.6	16.7	1061.7	12.8	1057.7	17.6	1057.7	16.7	1057.7	12.6	1057.7	17.6	0.0	(Ce.)
91500 zircon	44	92	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.89	1090.6	17.5	1078.9	17.1	1079.2	13.0	1078.4	17.6	1078.4	17.2	1078.4	12.9	1078.4	17.6	0.0	(Ce.)
GJ-1 zircon	40	555	0.1	0.06	0.00	0.10	0.00	0.81	0.01	0.91	601.2	14.3	600.2	8.2	598.0	7.1	600.2	14.3	600.2	8.2	600.2	7.1	600.2	8.2	0.0	(Ce.)
ST17MSR1-92	218	54	4.0	0.11	0.00	0.31	0.01	4.47	0.09	0.93	1727.8	14.1	1722.6	29.2	1720.5	17.4	1722.0	14.2	1722.0	29.2	1722.0	17.3	1722.0	14.2	0.0	(Ce.)
ST17MSR1-93	241	204	1.2	0.06	0.00	0.05	0.00	0.37	0.01	0.79	462.9	27.1	303.0	4.6	320.7	5.6	301.6	29.9	301.6	4.6	301.6	5.3	301.6	4.6	0.0	(Ce.)
ST17MSR1-94	116	161	0.7	0.05	0.00	0.02	0.00	0.17	0.00	0.65	280.9	44.2	154.4	2.5	161.6	3.9	153.9	47.7	153.9	2.5	153.9	3.7	153.9	2.5	0.0	(Ce.)
ST17MSR1-95	828	375	2.2	0.07	0.00	0.03	0.00	0.26	0.00	0.80	943.1	22.4	170.5	2.5	234.0	4.0	166.1	36.5	166.1	2.4	166.1	3.3	166.1	2.4	0.0	(Ce.)
ST17MSR1-96	186	416	0.4	0.05	0.00	0.02	0.00	0.16	0.00	0.75	288.2	29.3	146.2	2.1	153.9	2.9	145.6	32.0	145.6	2.1	145.6	2.7	145.6	2.1	0.0	(Ce.)
ST17MSR1-97	310	202	1.5	0.05	0.00	0.02	0.00	0.13	0.00	0.63	305.0	44.8	117.5	1.9	126.2	3.1	116.9	50.2	116.9	1.9	116.9	2.9	116.9	1.9	0.0	(Ce.)
ST17MSR1-98	140	156	0.9	0.05	0.00	0.03	0.00	0.20	0.00	0.67	289.0	41.7	178.7	2.9	185.8	4.3	178.2	44.7	178.2	2.9	178.2	4.1	178.2	2.9	0.0	(Ce.)
ST17MSR1-99	83	90	0.9	0.05	0.00	0.03	0.00	0.18	0.01	0.59	168.4	58.4	169.5	3.1	168.6	5.0	169.6	58.3	169.6	3.1	169.6	4.8	169.6	3.1	0.0	(Ce.)
ST17MSR1-100	524	593	0.9	0.05	0.00	0.01	0.00	0.08	0.00	0.70	196.5	35.0	74.4	1.1	77.8	1.6	74.2	37.7	74.2	1.1	74.2	1.5	74.2	1.1	0.0	(Ce.)
ST17MSR1-101	120	161	0.7	0.05	0.00	0.01	0.00	0.09	0.00	0.55	413.7	59.2	75.0	1.3	86.0	2.7	74.3	73.0	74.3	1.3	74.3	2.5	74.3	1.3	0.0	(Ce.)
ST17MSR1-102	41	54	0.8	0.06	0.00	0.05	0.00	0.38	0.01	0.67	427.9	50.0	309.4	6.1	322.2	8.6	308.3	53.8	308.3	6.0	308.3	8.3	308.3	6.0	0.0	(Ce.)
ST17MSR1-103	51	40	1.3	0.19	0.00	0.52	0.01	13.82	0.30	0.96	2768.2	9.8	2695.5	46.0	2732.1	20.7	2667.0	10.6	2667.0	45.1	2667.0	20.4	2667.0	10.6	0.0	(Ce.)
ST17MSR1-104	87	177	0.5	0.13	0.00	0.30	0.00	5.57	0.09	0.94	2145.8	9.7	1703.6	23.2	1907.1	14.2	1647.5	13.5	1647.5	21.7	1647.5	13.6	1647.5	13.5	0.0	(Ce.)
OD-3 zircon	338	243	1.4	0.05	0.00	0.01	0.00	0.03	0.00	0.43	0.0	85.3	32.2	0.6	31.2	1.3	32.2	84.5	32.2	0.6	32.2	1.3	32.2	0.6	0.0	(Ce.)
NIST SRM 612	38	12	3.1	0.91	0.01	0.86	0.03	108.43	3.52	0.99	5105.1	6.4	4013.9	95.2	4762.1	32.4	2283.2	48.8	2283.2	30.4	2283.2	29.5	2283.2	48.8	0.0	(Ce.)
NIST SRM 612	38	12	3.1	0.91	0.01	0.84	0.03	105.57	3.41	0.99	5104.5	6.4	3935.7	93.6	4735.2	32.3	2255.9	49.8	2255.9	30.3	2255.9	29.8	2255.9	49.8	0.0	(Ce.)
NIST SRM 612	32	12	2.6	0.91	0.01	0.80	0.03	100.27	3.24	0.99	5110.4	6.3	3773.9	90.7	4683.3	32.3	2192.2	52.0	2192.2	30.3	2192.2	30.6	2192.2	52.0	0.0	(Ce.)
91500 zircon	40	81	0.5	0.07	0.00	0.18	0.00	1.83	0.04	0.89	1068.4	18.6	1052.6	17.2	1054.2	13.3	1051.9	18.8	1051.9	17.2	1051.9	13.1	1051.9	18.8	0.0	(Ce.)
91500 zircon	53	103	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.90	1112.5	16.8	1055.5	16.4	1070.7	12.6	1052.9	17.4	1052.9	16.4	1052.9	12.4	1052.9	17.4	0.0	(Ce.)
91500 zircon	46	87	0.5	0.07	0.00	0.18	0.00	1.88	0.04	0.89	1065.8	18.0	1080.7	17.4	1072.2	13.2	1081.4	17.8	1081.4	17.4	1081.4	13.0	1081.4	17.8	0.0	(Ce.)

Legend:

	Dated Zircon Grains < 1.0 Ga
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	Dated Zircon Grains > 1.0 Ga
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Notes:

- n = 104
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age}) / (^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

C.5 Lower of Saroma Group (ST18LSR5)

U-Pb LA-ICP-MS Detrital Zircon Data of Kamibaro Unit																													
Sample Location: Station-18, Saroma Area, Eastern Hokkaido, Japan																													
Member / Group: Lower Member / Saroma Group																													
Belt: Tokoro Belt																													
Sample Type: Sandstone																													
Grain Number	Th (PPM)	U (PPM)	Th /U	Isotopic Ratios							U-Pb Age (Ma)								U-Pb Age (Ma)								Preferr ed Age	± 1σ	Disc. (%)
											before Stacey-Kramers Correction								after Stacey-Kramers Correction										
				207Pb/206Pb	± 1σ	206Pb/238U	± 1σ	207Pb/235U	± 1σ	Error Corr.	207Pb/206Pb	± 1σ	206Pb/238U	± 1σ	207Pb/235U	± 1σ	207Pb/206Pb	± 1σ	206Pb/238U	± 1σ	207Pb/235U	± 1σ							
ST18LSR5-1	203	239	0.8	0.05	0.00	0.02	0.00	0.17	0.00	0.61	283.4	46.5	155.6	2.4	161.3	3.7	155.1	50.3	155.1	2.4	155.1	3.8	155.1	2.4	0.0	(Cc.)			
ST18LSR5-2	490	295	1.6	0.05	0.00	0.02	0.00	0.13	0.00	0.59	169.0	48.6	123.5	1.9	123.9	2.9	123.3	50.0	123.3	1.9	123.3	3.0	123.3	1.9	0.0	(Cc.)			
ST18LSR5-3	46	76	0.6	0.07	0.00	0.03	0.00	0.27	0.01	0.60	930.6	53.6	176.4	3.4	237.7	7.0	171.9	86.3	171.9	3.2	171.9	6.6	171.9	3.2	0.0	(Cc.)			
ST18LSR5-4	148	167	0.9	0.11	0.00	0.01	0.00	0.19	0.01	0.62	1773.2	39.5	81.8	1.4	174.8	4.5	75.6	117.4	75.6	1.2	75.6	3.8	75.6	1.2	0.0	(Cc.)			
ST18LSR5-5	195	143	1.3	0.06	0.00	0.03	0.00	0.24	0.01	0.62	682.3	46.2	176.8	3.0	214.2	5.2	174.1	63.4	174.1	2.9	174.1	5.1	174.1	2.9	0.0	(Cc.)			
ST18LSR5-6	100	93	1.1	0.68	0.01	0.10	0.00	9.36	0.20	0.83	4716.1	17.2	602.2	10.2	2358.7	18.4	118.0	404.0	118.1	0.4	118.1	19.1	118.1	0.4	0.0	(Cc.)			
ST18LSR5-8	383	325	1.2	0.06	0.00	0.03	0.00	0.23	0.01	0.66	492.9	37.7	185.4	2.7	206.6	4.0	183.7	45.7	183.7	2.7	183.7	4.1	183.7	2.7	0.0	(Cc.)			
ST18LSR5-9	257	196	1.3	0.05	0.00	0.02	0.00	0.18	0.00	0.60	372.4	48.6	152.1	2.4	163.7	4.0	151.1	55.6	151.1	2.4	151.1	4.0	151.1	2.4	0.0	(Cc.)			
ST18LSR5-10	218	135	1.6	0.07	0.00	0.02	0.00	0.18	0.01	0.58	847.0	51.0	122.9	2.1	164.4	4.6	120.0	80.3	120.0	2.1	120.0	4.3	120.0	2.1	0.0	(Cc.)			
ST18LSR5-11	230	424	0.5	0.07	0.00	0.01	0.00	0.12	0.00	0.62	1094.3	37.9	72.9	1.1	112.5	2.5	70.3	72.1	70.3	1.0	70.3	2.3	70.3	1.0	0.0	(Cc.)			
ST18LSR5-12	574	395	1.4	0.05	0.00	0.03	0.00	0.19	0.00	0.65	363.7	38.8	159.3	2.3	170.4	3.4	158.4	44.0	158.4	2.3	158.4	3.5	158.4	2.3	0.0	(Cc.)			
ST18LSR5-13	239	364	0.7	0.06	0.00	0.02	0.00	0.17	0.00	0.64	723.1	37.9	125.2	1.9	158.4	3.3	122.9	55.1	122.9	1.8	122.9	3.2	122.9	1.8	0.0	(Cc.)			
OD-3 zircon	1607	870	1.8	0.05	0.00	0.01	0.00	0.03	0.00	0.54	62.5	54.9	33.3	0.5	33.1	0.9	33.2	55.9	33.2	0.5	33.2	0.9	33.2	0.5	0.0	(Cc.)			
GJ-1 zircon	36	495	0.1	0.06	0.00	0.10	0.00	0.81	0.02	0.74	616.8	28.1	600.0	8.2	596.2	7.8	599.6	28.4	599.6	8.2	599.6	8.8	599.6	8.2	0.0	(Cc.)			
NIST SRM 612	37	12	2.9	0.90	0.01	0.86	0.03	108.21	3.86	0.94	5115.4	16.7	3986.0	99.3	4749.2	34.5													
NIST SRM 612	35	12	2.9	0.90	0.01	0.82	0.03	103.27	3.72	0.94	5114.0	16.7	3851.5	97.9	4702.1	34.9													
NIST SRM 612	34	11	3.0	0.91	0.01	0.89	0.03	113.50	4.19	0.95	5134.0	16.7	4089.6	105.1	4797.2	35.8													
91500 zircon	50	98	0.5	0.07	0.00	0.18	0.00	1.86	0.04	0.77	1068.2	28.6	1066.0	17.1	1056.1	13.7	1065.9	28.6	1065.9	17.1	1065.9	14.8	1065.9	28.6	0.0	(Cc.)			
91500 zircon	48	96	0.5	0.07	0.00	0.18	0.00	1.90	0.04	0.78	1085.3	28.5	1079.0	17.3	1070.3	13.9	1078.7	28.6	1078.7	17.3	1078.7	15.0	1078.7	28.6	0.0	(Cc.)			
91500 zircon	45	89	0.5	0.08	0.00	0.18	0.00	1.88	0.04	0.78	1102.2	28.8	1058.8	17.3	1062.4	14.1	1056.8	29.6	1056.8	17.3	1056.8	15.1	1056.8	29.6	0.0	(Cc.)			

NIST SRM 612	39	13	2.9	0.91	0.01	0.86	0.03	108.29	3.53	1.01	5112.0	NA	3996.2	97.5	4756.8	33.8										
NIST SRM 612	37	13	2.9	0.91	0.01	0.82	0.03	103.34	3.41	1.01	5110.0	NA	3861.4	96.2	4709.7	34.2										
NIST SRM 612	36	12	3.0	0.92	0.01	0.89	0.03	113.58	3.86	1.01	5130.0	NA	4099.9	103.4	4804.8	35.2										
91500 zircon	53	102	0.5	0.07	0.00	0.18	0.00	1.86	0.03	0.94	1062.8	12.1	1069.4	15.9	1061.0	13.0	1069.7	12.1	1069.7	15.9	1069.7	11.4	1069.7	12.1	0.0	(Cc.)
91500 zircon	51	101	0.5	0.07	0.00	0.18	0.00	1.90	0.03	0.94	1079.9	12.0	1082.4	16.1	1075.3	13.1	1082.5	12.0	1082.5	16.1	1082.5	11.5	1082.5	12.0	0.0	(Cc.)
91500 zircon	48	93	0.5	0.08	0.00	0.18	0.00	1.88	0.03	0.93	1096.8	12.9	1062.1	16.1	1067.3	13.3	1060.5	13.2	1060.5	16.1	1060.5	11.7	1060.5	13.2	0.0	(Cc.)
ST18LSR5-14	387	352	1.1	0.05	0.00	0.06	0.00	0.43	0.01	0.87	397.8	16.5	357.8	4.6	360.3	5.5	357.4	16.9	357.4	4.6	357.4	4.6	357.4	4.6	0.0	(Cc.)
ST18LSR5-15	479	343	1.4	0.06	0.00	0.03	0.00	0.22	0.00	0.76	540.6	25.1	174.6	2.3	200.7	3.7	172.7	31.5	172.7	2.3	172.7	3.0	172.7	2.3	0.0	(Cc.)
ST18LSR5-16	37	27	1.4	0.11	0.00	0.29	0.01	4.54	0.12	0.95	1848.8	14.7	1648.7	35.9	1730.9	23.2	1627.0	17.1	1627.0	35.0	1627.0	21.1	1627.0	17.1	0.0	(Cc.)
ST18LSR5-17	298	295	1.0	0.08	0.00	0.01	0.00	0.15	0.00	0.69	1279.5	29.6	84.3	1.2	141.9	3.2	80.5	63.2	80.5	1.1	80.5	2.3	80.5	1.1	0.0	(Cc.)
ST18LSR5-18	261	253	1.0	0.07	0.00	0.01	0.00	0.13	0.00	0.63	995.7	37.1	82.3	1.2	121.4	3.0	79.8	65.8	79.8	1.1	79.8	2.4	79.8	1.1	0.0	(Cc.)
ST18LSR5-19	236	157	1.5	0.05	0.00	0.02	0.00	0.17	0.00	0.60	212.2	47.7	155.6	2.4	157.8	4.2	155.4	49.4	155.4	2.4	155.4	3.8	155.4	2.4	0.0	(Cc.)
ST18LSR5-20	69	84	0.8	0.07	0.00	0.07	0.00	0.66	0.01	0.79	904.3	28.1	431.6	7.2	511.2	9.9	424.4	38.0	424.4	7.0	424.4	8.4	424.4	7.0	0.0	(Cc.)
ST18LSR5-21	456	398	1.1	0.05	0.00	0.01	0.00	0.08	0.00	0.59	105.3	43.8	78.7	1.1	78.8	2.0	78.6	44.6	78.6	1.1	78.6	1.8	78.6	1.1	0.0	(Cc.)
ST18LSR5-22	304	236	1.3	0.06	0.00	0.07	0.00	0.58	0.01	0.87	723.3	16.7	411.5	5.5	458.8	6.9	407.2	20.3	407.2	5.5	407.2	5.5	407.2	5.5	0.0	(Cc.)
ST18LSR5-23	932	561	1.6	0.05	0.00	0.05	0.00	0.41	0.01	0.92	429.9	11.8	332.9	4.1	342.6	4.9	332.0	12.5	332.0	4.1	332.0	3.9	332.0	4.1	0.0	(Cc.)
ST18LSR5-24	126	198	0.6	0.09	0.00	0.03	0.00	0.34	0.01	0.78	1512.2	22.6	165.5	2.4	293.1	5.6	156.3	53.8	156.3	2.1	156.3	3.9	156.3	2.1	0.0	(Cc.)

91500 zircon	47	97	0.5	0.08	0.00	0.18	0.00	1.85	0.04	0.96	1095.6	10.8	1048.0	18.1	1059.5	14.2	1045.8	11.2	1045.8	18.1	1045.8	12.7	1045.8	11.2	0.0	(Cc.)
91500 zircon	46	97	0.5	0.07	0.00	0.18	0.00	1.84	0.04	0.96	1068.6	11.1	1053.8	18.2	1054.6	14.2	1053.1	11.2	1053.1	18.2	1053.1	12.8	1053.1	11.2	0.0	(Cc.)
ST18LSR5-27	81	122	0.7	0.06	0.00	0.03	0.00	0.29	0.01	0.73	646.2	37.9	214.3	3.9	253.4	6.3	211.4	49.7	211.4	3.8	211.4	5.4	211.4	3.8	0.0	(Cc.)
ST18LSR5-28	386	251	1.5	0.17	0.00	0.45	0.01	10.70	0.16	1.07	2567.0	NA	2413.1	32.7	2491.7	16.3										
ST18LSR5-29	108	449	0.2	0.12	0.00	0.33	0.01	5.42	0.08	1.07	1932.0	NA	1849.7	25.0	1883.6	14.5										
ST18LSR5-30	249	145	1.7	0.06	0.00	0.04	0.00	0.35	0.01	0.78	635.8	30.8	259.6	4.6	299.5	6.6	256.6	39.0	256.6	4.5	256.6	5.6	256.6	4.5	0.0	(Cc.)
ST18LSR5-31	19	311	0.1	0.25	0.00	0.50	0.01	17.35	0.26	1.08	3194.0	NA	2615.8	34.3	2948.6	16.5										
ST18LSR5-32	157	255	0.6	0.06	0.00	0.06	0.00	0.44	0.01	0.89	503.0	18.6	352.1	5.7	370.8	6.5	350.5	20.4	350.5	5.6	350.5	5.6	350.5	5.6	0.0	(Cc.)
ST18LSR5-33	1352	570	2.3	0.06	0.00	0.02	0.00	0.19	0.00	0.88	572.6	18.6	151.2	2.3	178.6	3.3	149.3	24.2	149.3	2.3	149.3	2.6	149.3	2.3	0.0	(Cc.)
ST18LSR5-34	346	326	1.0	0.05	0.00	0.01	0.00	0.07	0.00	0.61	161.2	51.0	69.4	1.2	71.6	2.1	69.2	54.0	69.2	1.1	69.2	1.9	<u>69.2</u>	<u>1.1</u>	0.0	(Cc.)
ST18LSR5-35	33	81	0.4	0.07	0.00	0.08	0.00	0.83	0.02	0.86	976.5	24.2	519.4	9.8	610.3	11.6	510.7	32.5	510.7	9.5	510.7	9.8	510.7	9.5	0.0	(Cc.)
ST18LSR5-36	300	237	1.3	0.07	0.00	0.02	0.00	0.21	0.00	0.77	996.8	29.2	132.5	2.2	190.2	4.3	128.6	50.4	128.6	2.1	128.6	3.3	128.6	2.1	0.0	(Cc.)
ST18LSR5-37	127	82	1.5	0.05	0.00	0.03	0.00	0.20	0.01	0.62	395.8	58.8	172.4	3.5	187.5	6.2	171.3	67.6	171.3	3.5	171.3	5.6	171.3	3.5	0.0	(Cc.)
ST18LSR5-38	848	773	1.1	0.05	0.00	0.01	0.00	0.10	0.00	0.81	232.4	25.5	91.2	1.4	96.1	2.0	90.9	27.8	90.9	1.4	90.9	1.7	90.9	1.4	0.0	(Cc.)
ST18LSR5-39	419	453	0.9	0.06	0.00	0.01	0.00	0.09	0.00	0.71	443.2	35.5	77.2	1.2	89.4	2.2	76.4	44.5	76.4	1.3	76.4	1.8	76.4	1.3	0.0	(Cc.)
OD-3 zircon	636	465	1.4	0.05	0.00	0.01	0.00	0.03	0.00	0.53	126.1	63.8	33.0	0.6	34.1	1.2	32.9	67.5	32.9	0.6	32.9	1.1	32.9	0.6	0.0	(Cc.)
GJ-1 zircon	33	466	0.1	0.06	0.00	0.10	0.00	0.81	0.01	1.01	620.0	NA	599.5	8.9	601.0	8.1										
NIST SRM 612	38	12	3.0	0.90	0.01	0.86	0.03	107.82	3.75	1.02	5102.0	NA	4004.1	104.6	4755.7	35.8										
NIST SRM 612	36	11	3.1	0.91	0.01	0.86	0.03	108.23	3.92	1.01	5108.0	NA	4001.3	108.6	4759.6	37.2										
NIST SRM 612	39	13	3.0	0.91	0.01	0.88	0.03	112.10	3.88	1.02	5118.0	NA	4086.3	105.6	4794.9	35.7										
91500 zircon	44	89	0.5	0.07	0.00	0.18	0.00	1.89	0.04	0.96	1068.7	11.7	1084.4	19.0	1075.2	14.6	1085.2	11.6	1085.2	19.1	1085.2	13.3	1085.2	11.6	0.0	(Cc.)
91500 zircon	47	97	0.5	0.07	0.00	0.18	0.00	1.88	0.04	0.96	1080.4	10.7	1070.6	18.5	1069.8	14.3	1070.1	10.8	1070.1	18.5	1070.1	12.9	1070.1	10.8	0.0	(Cc.)
91500 zircon	44	94	0.5	0.08	0.00	0.18	0.00	1.89	0.04	0.96	1096.5	11.0	1070.4	18.6	1075.0	14.4	1069.2	11.2	1069.2	18.6	1069.2	13.0	1069.2	11.2	0.0	(Cc.)
NIST SRM 612	40	13	3.1	0.90	0.01	0.86	0.03	108.19	3.95	0.99	5106.1	8.7	4004.9	106.5	4753.8	36.2	5093.4	8.8	5093.0	177.0	5093.4	51.1	5093.4	8.8	0.0	(Cc.)
NIST SRM 612	38	12	3.1	0.91	0.01	0.86	0.03	108.61	4.11	0.99	5112.9	8.7	4002.1	110.4	4757.6	37.5	2271.9	67.3	2271.9	35.1	2271.9	39.1	2271.9	67.3	0.0	(Cc.)
NIST SRM 612	41	13	3.1	0.91	0.01	0.89	0.03	112.48	4.09	0.99	5122.4	8.7	4087.2	107.5	4792.9	36.0	2292.7	67.0	2292.7	33.3	2292.7	38.8	2292.7	67.0	0.0	(Cc.)
91500 zircon	47	93	0.5	0.07	0.00	0.18	0.00	1.90	0.04	0.89	1075.0	21.0	1084.7	20.2	1073.9	15.0	1085.2	20.9	1085.2	20.2	1085.2	15.2	1085.2	20.9	0.0	(Cc.)
91500 zircon	49	101	0.5	0.07	0.00	0.18	0.00	1.89	0.04	0.89	1086.7	20.5	1070.8	19.6	1068.5	14.7	1070.1	20.7	1070.1	19.6	1070.1	14.8	1070.1	20.7	0.0	(Cc.)
91500 zircon	47	98	0.5	0.08	0.00	0.18	0.00	1.90	0.04	0.89	1102.8	20.6	1070.7	19.7	1073.7	14.8	1069.2	21.0	1069.2	19.7	1069.2	14.9	1069.2	21.0	0.0	(Cc.)
ST18LSR5-40	1184	517	2.3	0.09	0.00	0.03	0.00	0.34	0.01	0.86	1496.6	19.6	169.6	2.9	296.7	5.2	160.3	46.0	160.3	2.6	160.3	3.8	160.3	2.6	0.0	(Cc.)
ST18LSR5-41	82	54	1.5	0.22	0.00	0.03	0.00	1.07	0.03	0.86	3034.2	23.1	216.9	5.1	734.4	15.6	169.0	154.0	169.1	3.1	169.1	10.7	169.1	3.1	0.0	(Cc.)

ST18LSR5-42	147	128	1.1	0.06	0.00	0.02	0.00	0.17	0.01	0.63	515.0	54.5	138.8	2.8	160.2	4.9	137.2	68.8	137.3	2.7	137.3	4.6	137.3	2.7	0.0	(Cc.)
ST18LSR5-43	247	172	1.4	0.06	0.00	0.02	0.00	0.18	0.01	0.67	566.9	46.5	139.2	2.6	164.2	4.5	137.4	60.6	137.4	2.6	137.4	4.1	137.4	2.6	0.0	(Cc.)
ST18LSR5-44	116	143	0.8	0.07	0.00	0.04	0.00	0.40	0.01	0.77	805.5	33.7	277.9	5.2	338.9	7.4	273.1	47.1	273.1	5.1	273.1	6.7	273.1	5.1	0.0	(Cc.)
ST18LSR5-45	869	705	1.2	0.06	0.00	0.01	0.00	0.11	0.00	0.77	529.8	30.8	91.6	1.5	108.8	2.3	90.4	40.4	90.4	1.5	90.4	2.1	90.4	1.5	0.0	(Cc.)
ST18LSR5-46	57	74	0.8	0.08	0.00	0.03	0.00	0.31	0.01	0.68	1207.7	47.4	176.6	3.9	269.9	8.1	169.8	91.5	169.8	3.6	169.8	7.0	169.8	3.6	0.0	(Cc.)
ST18LSR5-47	65	125	0.5	0.05	0.00	0.01	0.00	0.09	0.00	0.52	281.3	80.2	77.6	1.6	83.5	3.4	77.2	90.9	77.2	1.6	77.2	3.3	77.2	1.6	0.0	(Cc.)
ST18LSR5-48	837	570	1.5	0.12	0.00	0.04	0.00	0.74	0.01	0.90	1974.6	14.6	278.7	4.6	556.6	8.0	254.8	44.4	254.8	3.9	254.8	5.6	254.8	3.9	0.0	(Cc.)
ST18LSR5-49	88	188	0.5	0.14	0.00	0.41	0.01	8.26	0.16	0.94	2298.6	11.7	2217.7	34.1	2249.7	17.2	2200.6	12.5	2200.6	33.6	2200.6	17.5	2200.6	12.5	0.0	(Cc.)
ST18LSR5-50	1508	1083	1.4	0.05	0.00	0.03	0.00	0.18	0.00	0.85	208.7	23.9	164.0	2.7	165.2	3.0	163.8	24.5	163.8	2.7	163.8	3.0	163.8	2.7	0.0	(Cc.)
ST18LSR5-51	140	73	1.9	0.07	0.00	0.05	0.00	0.50	0.01	0.75	1030.8	39.5	310.9	6.6	408.8	10.1	302.9	62.6	302.9	6.3	302.9	9.1	302.9	6.3	0.0	(Cc.)
ST18LSR5-52	144	109	1.3	0.07	0.00	0.03	0.00	0.26	0.01	0.69	912.0	44.9	174.5	3.5	234.4	6.5	170.1	71.5	170.1	3.3	170.1	5.7	170.1	3.3	0.0	(Cc.)
OD-3 zircon	1740	1001	1.7	0.05	0.00	0.01	0.00	0.03	0.00	0.64	80.2	48.6	33.0	0.6	33.3	0.9	32.9	50.1	33.0	0.6	33.0	0.9	33.0	0.6	0.0	(Cc.)
GJ-1 zircon	38	517	0.1	0.06	0.00	0.10	0.00	0.82	0.02	0.90	638.1	17.9	601.6	9.7	604.1	8.5	600.9	18.3	600.9	9.7	600.9	8.6	600.9	9.7	0.0	(Cc.)
NIST SRM 612	35	13	2.7	0.91	0.01	0.81	0.03	103.19	3.76	0.99	5126.4	8.6	3824.0	102.8	4706.2	36.1	2196.8	71.4	2196.8	33.5	2196.8	40.4	2196.8	71.4	0.0	(Cc.)
NIST SRM 612	30	10	3.1	0.91	0.01	0.89	0.04	113.17	4.63	0.99	5116.4	8.6	4118.6	122.0	4799.0	40.6	2309.3	65.5	2309.3	37.8	2309.3	39.0	2309.3	65.5	0.0	(Cc.)
NIST SRM 612	39	13	3.0	0.91	0.01	0.88	0.03	110.54	4.03	0.99	5114.0	8.7	4052.6	107.2	4775.4	36.2	2288.6	66.8	2288.6	33.7	2288.6	38.7	2288.6	66.8	0.0	(Cc.)
91500 zircon	49	99	0.5	0.07	0.00	0.18	0.00	1.85	0.04	0.89	1075.2	20.8	1056.6	19.5	1055.2	14.7	1055.8	21.0	1055.8	19.4	1055.8	14.8	1055.8	21.0	0.0	(Cc.)
91500 zircon	50	100	0.5	0.07	0.00	0.17	0.00	1.83	0.04	0.89	1086.6	20.8	1039.3	19.1	1047.2	14.6	1037.2	21.4	1037.2	19.1	1037.2	14.7	1037.2	21.4	0.0	(Cc.)
91500 zircon	46	98	0.5	0.07	0.00	0.18	0.00	1.85	0.04	0.89	1073.9	20.9	1056.0	19.5	1054.4	14.7	1055.2	21.1	1055.2	19.5	1055.2	14.8	1055.2	21.1	0.0	(Cc.)
NIST SRM 612	33	12	2.7	0.91	0.01	0.82	0.03	103.32	4.02	0.89	5116.0	24.9	3848.9	99.9	4712.8	34.9										
NIST SRM 612	29	9	3.2	0.91	0.01	0.90	0.04	113.31	4.89	0.91	5106.0	24.8	4144.8	119.4	4805.6	39.4										
NIST SRM 612	37	12	3.0	0.90	0.01	0.88	0.03	110.68	4.31	0.89	5103.6	24.9	4078.4	104.2	4782.0	34.9										
91500 zircon	46	92	0.5	0.07	0.00	0.18	0.00	1.85	0.05	0.67	1060.5	39.2	1065.0	17.4	1059.5	13.3	1065.2	39.1	1065.2	17.4	1065.2	17.4	1065.2	39.1	0.0	(Cc.)
91500 zircon	48	93	0.5	0.07	0.00	0.18	0.00	1.83	0.05	0.67	1071.8	39.1	1047.6	17.1	1051.4	13.2	1046.5	39.8	1046.5	17.1	1046.5	17.3	1046.5	39.8	0.0	(Cc.)
91500 zircon	44	91	0.5	0.07	0.00	0.18	0.00	1.85	0.05	0.67	1059.2	39.3	1064.4	17.5	1058.7	13.3	1064.6	39.1	1064.6	17.5	1064.6	17.4	1064.6	39.1	0.0	(Cc.)
ST18LSR5-53	260	200	1.3	0.06	0.00	0.02	0.00	0.15	0.00	0.52	478.9	58.6	123.1	2.0	141.6	3.6	121.8	73.1	121.8	1.9	121.8	4.0	121.8	1.9	0.0	(Cc.)
ST18LSR5-54	296	218	1.3	0.06	0.00	0.06	0.00	0.47	0.01	0.60	527.7	45.3	365.0	5.5	386.0	6.3	363.2	50.2	363.2	5.4	363.2	8.3	363.2	5.4	0.0	(Cc.)
ST18LSR5-55	223	238	0.9	0.05	0.00	0.04	0.00	0.28	0.01	0.57	419.2	49.5	230.0	3.5	246.4	4.7	228.7	55.7	228.7	3.5	228.7	5.9	228.7	3.5	0.0	(Cc.)
ST18LSR5-56	301	237	1.3	0.06	0.00	0.03	0.00	0.27	0.01	0.57	509.4	49.0	214.6	3.3	240.0	4.6	212.8	58.9	212.8	3.3	212.8	5.7	212.8	3.3	0.0	(Cc.)
ST18LSR5-57	294	263	1.1	0.05	0.00	0.02	0.00	0.16	0.00	0.54	198.5	56.4	150.2	2.3	152.2	3.4	150.0	58.1	150.0	2.3	150.0	4.1	150.0	2.3	0.0	(Cc.)
ST18LSR5-58	155	110	1.4	0.07	0.00	0.06	0.00	0.57	0.02	0.62	956.0	45.5	364.9	6.2	455.6	8.5	357.3	66.4	357.3	6.0	357.3	10.2	357.3	6.0	0.0	(Cc.)

ST18LSR5-59	71	122	0.6	0.12	0.00	0.34	0.01	5.50	0.14	0.68	1908.6	32.5	1894.5	27.3	1896.0	15.2	1892.6	32.9	1892.6	27.3	1892.6	21.2	1892.6	32.9	0.0	(Cc.)
ST18LSR5-60	113	96	1.2	0.11	0.00	0.34	0.01	5.44	0.14	0.69	1877.0	32.9	1905.2	28.8	1886.5	15.9	1909.3	32.1	1909.3	29.0	1909.3	21.6	1909.3	32.1	0.0	(Cc.)
ST18LSR5-61	403	425	0.9	0.06	0.00	0.01	0.00	0.12	0.00	0.54	672.6	49.4	93.0	1.4	118.0	2.5	91.3	70.9	91.3	1.4	91.3	2.9	91.3	1.4	0.0	(Cc.)
ST18LSR5-62	461	331	1.4	0.10	0.00	0.05	0.00	0.70	0.02	0.61	1606.4	35.4	320.7	4.6	534.2	7.1	302.5	81.7	302.5	4.1	302.5	10.1	302.5	4.1	0.0	(Cc.)
NIST SRM 612	43	14	3.0	0.90	0.01	0.83	0.03	104.63	3.87	0.88	5104.1	24.9	3910.3	94.7	4725.5	32.7										
NIST SRM 612	40	13	2.9	0.91	0.01	0.85	0.03	106.79	4.02	0.88	5107.3	24.9	3963.9	97.9	4746.1	33.5										
NIST SRM 612	42	13	3.1	0.91	0.01	0.88	0.03	111.94	4.23	0.88	5116.2	24.9	4085.9	100.3	4793.4	33.6										
91500 zircon	50	99	0.5	0.07	0.00	0.18	0.00	1.86	0.05	0.67	1070.7	38.8	1064.9	17.1	1062.8	13.1	1064.6	39.0	1064.6	17.2	1064.6	17.2	1064.6	39.0	0.0	(Cc.)
91500 zircon	52	108	0.5	0.08	0.00	0.18	0.00	1.88	0.05	0.67	1115.0	38.3	1051.8	16.6	1068.5	12.8	1048.9	40.0	1048.9	16.6	1048.9	17.1	1048.9	40.0	0.0	(Cc.)
91500 zircon	48	95	0.5	0.08	0.00	0.18	0.00	1.95	0.05	0.67	1121.6	38.5	1084.5	17.6	1092.8	13.3	1082.7	39.5	1082.7	17.5	1082.7	17.6	1082.7	39.5	0.0	(Cc.)
NIST SRM 612	40	13	3.0	0.90	0.01	0.83	0.03	103.57	3.97	0.89	5088.7	24.3	3912.1	99.7	4723.2	34.5										
NIST SRM 612	37	13	2.9	0.90	0.01	0.85	0.03	105.71	4.12	0.90	5092.0	24.3	3965.7	102.8	4743.8	35.2										
NIST SRM 612	39	13	3.1	0.91	0.01	0.89	0.03	110.81	4.33	0.90	5100.9	24.2	4087.7	105.4	4791.2	35.3										
91500 zircon	47	94	0.5	0.07	0.00	0.18	0.00	1.84	0.05	0.73	1048.9	38.2	1065.5	20.1	1061.3	14.9	1066.3	37.7	1066.3	20.2	1066.3	18.4	1066.3	37.7	0.0	(Cc.)
91500 zircon	49	103	0.5	0.08	0.00	0.18	0.00	1.86	0.05	0.73	1093.4	37.6	1052.3	19.6	1067.0	14.7	1050.5	38.7	1050.5	19.6	1050.5	18.2	1050.5	38.7	0.0	(Cc.)
91500 zircon	46	90	0.5	0.08	0.00	0.18	0.00	1.93	0.05	0.74	1099.9	37.9	1085.1	20.6	1091.3	15.2	1084.4	38.2	1084.4	20.6	1084.4	18.7	1084.4	38.2	0.0	(Cc.)
ST18LSR5-64	86	140	0.6	0.18	0.00	0.50	0.01	12.59	0.33	0.74	2681.7	28.7	2607.6	41.4	2651.2	18.8	2581.8	30.8	2581.8	40.7	2581.8	24.9	2581.8	30.8	0.0	(Cc.)
ST18LSR5-65	224	226	1.0	0.10	0.00	0.03	0.00	0.44	0.01	0.69	1565.0	37.6	208.6	3.9	370.4	7.0	196.5	90.2	196.6	3.4	196.6	7.6	196.6	3.4	0.0	(Cc.)
ST18LSR5-66	79	226	0.3	0.05	0.00	0.02	0.00	0.17	0.01	0.62	177.9	56.8	156.0	2.9	157.6	3.9	155.9	57.5	155.9	3.0	155.9	4.5	155.9	3.0	0.0	(Cc.)
ST18LSR5-67	165	425	0.4	0.15	0.00	0.35	0.01	6.92	0.17	0.72	2288.8	29.8	1915.9	29.5	2103.3	16.4	1855.6	40.0	1855.6	27.8	1855.6	23.9	1855.6	40.0	0.0	(Cc.)
ST18LSR5-68	237	237	1.0	0.07	0.00	0.04	0.00	0.40	0.01	0.68	787.5	42.7	276.9	5.1	339.2	6.5	272.3	58.9	272.3	4.9	272.3	7.6	272.3	4.9	0.0	(Cc.)
ST18LSR5-69	6	17	0.3	0.12	0.00	0.04	0.00	0.68	0.03	0.70	1878.4	61.3	270.8	8.8	527.3	19.5	250.0	176.0	249.7	7.5	249.6	18.2	249.7	7.5	0.0	(Cc.)
ST18LSR5-70	37	32	1.1	0.11	0.00	0.06	0.00	0.99	0.04	0.73	1806.3	45.3	405.9	10.5	699.4	17.1	378.0	114.0	378.5	9.1	378.5	17.8	378.5	9.1	0.0	(Cc.)
ST18LSR5-71	36	49	0.7	0.07	0.00	0.06	0.00	0.54	0.02	0.67	805.5	55.9	372.0	8.6	439.3	11.7	366.6	73.7	366.6	8.4	366.6	12.4	366.6	8.4	0.0	(Cc.)
ST18LSR5-72	104	128	0.8	0.06	0.00	0.06	0.00	0.43	0.01	0.67	486.4	49.2	346.3	6.7	365.7	7.8	344.8	53.7	344.8	6.7	344.8	9.1	344.8	6.7	0.0	(Cc.)
ST18LSR5-73	123	111	1.1	0.11	0.00	0.31	0.01	4.56	0.12	0.75	1765.8	32.5	1723.1	30.1	1744.0	17.5	1718.2	33.5	1718.2	30.0	1718.2	22.4	1718.2	33.5	0.0	(Cc.)
ST18LSR5-74	232	126	1.8	0.05	0.00	0.02	0.00	0.17	0.01	0.58	242.2	65.5	156.7	3.2	162.4	4.8	156.3	69.0	156.3	3.1	156.3	5.2	156.3	3.1	0.0	(Cc.)
ST18LSR5-75	145	184	0.8	0.07	0.00	0.01	0.00	0.13	0.00	0.59	1029.7	55.3	82.4	1.6	124.8	3.7	79.8	100.5	79.8	1.6	79.8	3.6	79.8	1.6	0.0	(Cc.)
ST18LSR5-76	240	222	1.1	0.05	0.00	0.05	0.00	0.37	0.01	0.67	350.1	47.0	314.2	5.8	319.1	6.3	314.0	48.1	314.0	5.8	314.0	7.6	314.0	5.8	0.0	(Cc.)
OD-3 zircon	737	487	1.5	0.05	0.00	0.01	0.00	0.03	0.00	0.51	0.0	75.5	32.7	0.6	32.2	1.1	32.7	74.8	32.7	0.6	32.7	1.2	32.7	0.6	0.0	(Cc.)
GJ-1 zircon	34	474	0.1	0.06	0.00	0.10	0.00	0.81	0.02	0.70	604.3	39.0	602.5	10.2	603.6	8.8	602.4	39.0	602.4	10.2	602.4	11.5	602.4	10.2	0.0	(Cc.)

[illegible]

91500 zircon	47	86	0.5	0.07	0.00	0.18	0.00	1.88	0.05	0.75	1070.0	33.7	1076.2	19.0	1068.7	14.1	1076.4	33.5	1076.4	19.0	1076.4	16.9	1076.4	33.5	0.0	(Cc.)
91500 zircon	53	105	0.5	0.07	0.00	0.18	0.00	1.85	0.05	0.75	1082.9	32.9	1053.6	17.9	1057.9	13.4	1052.3	33.5	1052.3	17.9	1052.3	16.2	1052.3	33.5	0.0	(Cc.)
NIST SRM 612	39	13	3.0	0.91	0.00	0.84	0.03	105.49	3.54	1.02	5110.0	NA	3922.6	99.5	4734.6	34.1										
NIST SRM 612	36	13	2.8	0.90	0.00	0.84	0.03	104.82	3.51	1.02	5101.0	NA	3921.4	99.3	4728.2	34.1										
NIST SRM 612	38	12	3.0	0.91	0.00	0.82	0.03	103.39	3.54	1.02	5107.0	NA	3869.1	100.5	4714.5	34.8										
91500 zircon	57	111	0.5	0.08	0.00	0.18	0.00	1.85	0.04	0.98	1091.5	7.0	1049.9	18.8	1060.1	13.8	1048.0	7.2	1048.0	18.7	1048.0	12.9	1048.0	7.2	0.0	(Cc.)
91500 zircon	62	117	0.5	0.08	0.00	0.18	0.00	1.91	0.04	0.99	1079.0	5.9	1085.4	19.2	1079.8	13.8	1085.7	5.9	1085.7	19.3	1085.7	13.0	1085.7	5.9	0.0	(Cc.)
91500 zircon	57	110	0.5	0.08	0.00	0.18	0.00	1.86	0.04	0.98	1091.2	7.2	1056.6	18.9	1064.5	13.9	1055.0	7.3	1055.0	18.9	1055.0	13.0	1055.0	7.3	0.0	(Cc.)

Legend:

	Dated Zircon Grains < 1.0 Ga
	Dated Zircon Grains > 1.0 Ga

Notes:

- n = 84
- All grains <1.0 Ga, preferred ages are based on $^{206}\text{Pb}/^{238}\text{U}$, whereas grains >1.0 Ga, preferred ages are based on $^{207}\text{Pb}/^{206}\text{Pb}$
- *) = YSG Age (Youngest Single Grain)
- Disc. (%) for grains >1.0 Ga defined as $\{1 - (^{206}\text{Pb}/^{238}\text{U Age})/(^{207}\text{Pb}/^{206}\text{Pb Age})\} \times 100\%$
- This study applied 10% of discordant filter, and grains with high discordance (>10%) were excluded from the calculations

Abbreviations:

Cc. = Concordant

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