

Division of Multidisciplinary Chemistry – Polymer Materials Science –



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Prof.
TAKENAKA, Mikihiro
(D. Eng.)



Assoc. Prof.
OGAWA, Hiroki
(D. Eng.)



Assist. Prof.
NAKANISHI, Yohei
(D. Eng.)



Assist. Prof.
SHIBASAKI, Kazuki *

*New Research Field
Development Project

Techn. Staff

ISODA, Kumiko
TATEISHI, Nayuko

Students

SEKO, Tamio (D3)	TAMURA, Yukiko (D1)	NOMURA, Yuki (M2)	YOSHINO, Syunki (M1)
HAMAMOTO, Hiroki (D3)	BANDO, Shusuke (D1)	HOSOMI, Yu (M2)	SHIMOTSU, Yui (U. G.)
ARAWAKA, Masato (D2)	SHIMABUKURO, Wataru (M2)	KUBO, Haruki (M1)	TAKAGI, Jumpei (U. G.)
SAWADA, Satoshi (D1)	SHIRAISHI, Harunori (M2)	TOBITA, Naoto (M1)	MATSUMOTO, Ryohei (U. G.)

Scope of Research

The structure and molecular motion of polymer substances are studied, mainly using scattering methods such as X-ray, neutron, and light with intent to solve fundamentally important problems in polymer science. The main projects are studied on 1) the morphologies and the dynamics of self-assembling processes in block copolymers, 2) the hierarchical structures in crystalline polymer and rubber-filler systems, 3) the viscoelastic effects in glassy materials, 4) formation processes and ordering structures in polymer thin films.

KEYWORDS

Polymer Physics	Polymer Properties
Self Assembly	Softmatter
Hierarchical Structure	



Recent Selected Publications

Nakanishi, Y.; Ishige, R.; Ogawa, H.; Huang, Y.; Sakakibara, K.; Ohno, K.; Kanaya, T.; Takenaka, M.; Tsujii, Y., Unified Explanation for Self-Assembly of Polymer-Brush-Modified Nanoparticles in Ionic Liquids, *Polym. J.*, **55**, 1199-1209 (2023).
Shibata, M.; Nakanishi, Y.; Abe, J.; Arima-Osonoi, H.; Iwase, H.; Shibayama, M.; Motokawa, R.; Kumada, T.; Takata, S.; Yamamoto, K.; Takenaka, M.; Miyazaki, T., Structural Changes of Polystyrene Particles in Subcritical and Supercritical Water Revealed by in situ Small-Angle Neutron Scattering, *Polym. J.*, **55**, 1165-1170 (2023).
Watanabe, Y.; Ogawa, H.; Konishi, T.; Nishitsuji, S.; Ono, S.; Shimizu, N.; Takenaka, M., Distribution of Oriented Lamellar Structures in Injection-Molded High-Density Polyethylene Visualized via the Small Angle X-ray Scattering-Computed Tomography Method, *Macromolecules*, **56**(15), 5964-5973 (2023).
Watanabe, Y.; Nishitsuji, S.; Takenaka, M., Anomalous Small-Angle X-ray Scattering Analyses on Hierarchical Structures of Rubber-Filler Systems, *J. Appl. Crystallogr.*, **56**(2), 461-467 (2023).
Kishimoto, M.; Takenaka, M.; Iwabuki, H., Spatial Distribution of the Amorphous Region Constrained by Polymer Crystallites, *Macromolecules*, **56**(1), 207-214 (2023).