

ABSTRACTS

in the [100] direction, the same step structure as observed in single crystals of 99.995% pure tin at 13°C/cm is also generated.

**Investigation on Cast Iron Having Refined Graphite Produced
by Melting Cast Iron Covered with Slag Containing TiO₂. (VIII)**

**Influences of Addition of Metallic Titanium, Ferro-titanium, and Cu-Ti
Alloy upon the Structure of Gray Cast Iron**

Hiroshi SAWAMURA and Masatoshi TSUDA

(Sawamura Laboratory)

Journal of the Iron and Steel Institute of Japan
(*Tetsu to Hagane*), 43, 1234 (1957)

The cast iron melts containing about 3.5% C and about 1.8% Si were cast in small moulds used in the previous experiments after the addition of Ti in the form of metallic Ti, Ferro-Ti, and Cu-Ti alloy. In the present scope of experiments, gray cast irons having the same eutectic graphite structure may be prepared in the present case as in the previous experiments where cast iron melts have been treated with the slag containing TiO₂, as far as more than 0.05% Ti was contained in the cast metal in the form of TiC and the melts were cast at the temperature lower than 1400°C. It is doubtful, however, whether or not the above mentioned result can always be obtained when the larger mould is used for casting.

**Investigation on Cast Iron Having Refined Graphite Produced
by Melting Cast Iron Coverd with Slag Containing TiO₂. (IX)**

**Investigation on the Net Structure and the Estimation of
Micro-Hardness of S-H Cast Iron**

Hiroshi SAWAMURA and Masatoshi TSUDA

(Sawamura Laboratory)

Journal of the Iron and Steel Institute of Japan
(*Tetsu to Hagane*), 43, 1286 (1957)

The fracture surface as well as the polished surface of S-H cast iron shows a net structure having a boundary line of light gray color. Observation of the microstructure revealed that the boundary-line portion was a group of austenite dendrites and that the mesh of net (meshy portion) consisted of eutectic graphite structure.

The micro-hardnesses of boundary-line and meshy portions were estimated.

ABSTRACTS

The results indicated that the hardness of boundary-line portion was about 1.5 ~2.7 times of meshy portion.

The authors presumed that one of the major reasons of the greater wear-resistance of S-H cast iron was based upon the following characteristics :

1. The existence of a unique net structure of S-H cast iron.
2. The presence of a boundary-line portion of greater hardness in the matrix of eutectic graphite structure of lower hardness.
3. The fine and uniform distribution of fine TiC particles in S-H cast iron casting.

Ultraviolet Spectrophotometric Determination of Iron(III) as Chloro-complex

Masayoshi ISHIBASHI, Tsunenobu SHIGEMATSU, Yuroku YAMAMOTO,
Masayuki TABUSHI and Toyokichi KITAGAWA

(Ishibashi Laboratory)

Bulletin of the Chemical Society of Japan, **30**, 433, (1957)

The absorption spectra have been investigated for the solution of ferric perchlorate at various concentrations of hydrochloric acid. It was found that the tetra chloro-complex is formed even at the small concentration of chloride when the acidity is considerably high, but it may not be formed even at higher chloride concentration if the acidity is low. It was also assumed from the result of change in absorption spectra that the reduction of ferric to ferrous ion occurred in concentrated hydrochloric acid such as 9.6 *N*. A method for spectrophotometric determination of iron has been then studied using hydrochloric acid as reagent. Effects of temperature, acidity and diverse ions have been examined and the iron content of iron-base alloys has been determined by differential method. Some of the results obtained are as follows :

- 1) The Beer's law is followed in the range 0.2~20 p.p.m. of iron by ordinary method and up to 60 p.p.m. by differential method.
- 2) The effect of temperature to the absorbance is almost negligible in the range 10~25°C.
- 3) The presence of such cations as Na⁺, K⁺, NH₄⁺, Co⁺⁺, Zn⁺⁺, Mn⁺⁺ and Al³⁺ does not interfere in the concentration of 200 p.p.m. For Cu⁺⁺ and Ti⁴⁺, it is found that the maximum allowable concentration was 2.0 p.p.m.
- 4) In the determination of the iron content of iron base alloys by the proposed method the error was about 0.4%.

Fluorometric Determination of Aluminum with Pentachrome Blue Black R

Masayoshi ISHIBASHI, Tsunenobu SHIGEMATSU and Yasuharu NISHIKAWA