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

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Bulltein 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^+, NH_4^+, Co^{++}, Zn^{++}, Mn^{++} and Al^{3+} does not interfere in the concentration of 200 p.p.m. For Cu^{++} and Ti^{4+}, 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

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Optimum conditions for the fluorometric determination of aluminum by the use of Pontachrome Blue Black R have been investigated. For aluminum solutions of pH 4.8 and aluminum content 0.2-1.0 g, 1-12 g, and 12-18 g, 1.0 ml, 1.5 ml, and 2.0 ml, respectively, of 1% aqueous solution of Pontachrome Blue Black R were added. Each solution was heated for 10 minutes on a water bath, cooled, made up to 50 ml, and measured its intensity of fluorescence. The interfering elements in the determination of aluminum by this method are Fe^{3+}, Ga, Co, and vanadic acid. Also, the presence of a large amount of Cu, Ti, and Ni has a disturbing influence.

Studies on the Fluorometric Analysis. (V)

Determination of Gallium with 8-Hydroxyquinaldine

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J. Chem. Soc. Japan, Pure Chemistry Section (*Nippon Kagaku Zasshi*), 78, 1139 (1957)

8-Hydroxyquinaldine reacts with gallium ion in weak acidic solution and its chloroform extracts show a distinct green fluorescence in ultraviolet light. Using this reaction, the authors established the fluorometric method for trace amounts of gallium as follows:

Samples containing 0-30 μg of gallium in a volume of approximately 40 ml were treated with 1 ml of 1%-8-hydroxyquinaldine-1*N*-acetic acid, and was extracted three times with 10 ml portions of chloroform. The extracts were diluted to 50 ml with chloroform and the fluorescence intensity was measured.

A few elements such as cupric cupper, tartaric acid, and large amounts of indium and thallium are interfered. Ferric ion and Vanadate ion are also interfered, however, these ions are easily reduced by adding 1-2 ml of 1%-hydroxylamine hydrochloride solution and gallium quantified without interference.

Studies on the Fluorometric Analysis. (VI)

Fluorometric Determination of Gallium, Indium and Beryllium by Successive Extraction

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