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(JFA/JSA)

**Methods for chemical analysis of
ferroboron — Part 4: Methods for
determination of aluminium content**

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal of establishing a Japanese Industrial Standard submitted by Japan Ferroalloy Association (JFA)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

Consequently, **JIS G 1327 : 1992** has been withdrawn, one of the separated parts of which is replaced with this Standard.

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JIS G 1327 consists of the following 4 parts under the general title "*Methods for chemical analysis of ferroboron*" :

Part 1 : Methods for determination of boron content

Part 2 : Methods for determination of carbon content

Part 3 : Method for determination of silicon content

Part 4 : Methods for determination of aluminium content

Methods for chemical analysis of ferroboron — Part 4 : Methods for determination of aluminium content

Introduction

JIS G 1327 was established in 1968 and after that, the second revision was carried out in 1992. To correspond to the progress thereafter of analytical technology, JIS G 1327 : 1992 was withdrawn at this time, and this Japanese Industrial Standard has been established by dividing a part of the said standard so as to specify the methods for determination of aluminium content.

The corresponding International Standard has not been established at this point.

1 Scope

This Standard specifies the methods for determination of aluminium content in ferroboron.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS G 1301 *Ferroalloys — General rules for chemical analysis*

JIS K 8001 *General rule for test methods of reagents*

3 General

General matters common to the method for chemical analysis shall be in accordance with JIS G 1301.

4 Classification of determination methods

The determination methods of aluminium content shall be in accordance with either of the following.

- a) **Disodium dihydrogen ethylenediamine tetraacetate-copper back titration method after iron separation** This method is applicable to the sample of 0.05 % (mass fraction) or over up to and including 12.0 % (mass fraction) in aluminium content.

- b) **Atomic absorption spectrometry** This method is applicable to the sample of 0.02 % (mass fraction) or over up to and including 12.0 % (mass fraction) in aluminium content.
- c) **ICP atomic emission spectroscopy** This method is applicable to the sample of 0.01 % (mass fraction) or over up to and including 12.0 % (mass fraction) in aluminium content.

5 Disodium dihydrogen ethylenediamine tetraacetate-copper back titration method after iron separation

5.1 Summary

The sample is decomposed by the mixed acid of hydrochloric acid and nitric acid, undecomposed residue is filtered and fused with sodium disulfate, the fused is dissolved in hydrochloric acid, and the solution is mixed with the filtrate. The remaining iron in the solution is extracted with 4-methyl-2-pentanone, and removed. pH is adjusted, the remaining iron is masked by adding disodium dihydrogen ethylenediamine tetraacetate (hereafter referred to as "EDTA2Na"), and the solution is titrated with EDTA2Na solution by adding Cu-1-pyridylazo-2-naphtol (hereafter referred to as "Cu-PAN") as an indicator slightly in excess, then the excess EDTA2Na is back titrated with copper solution.

5.2 Reagents

Reagents shall be as follows.

5.2.1 Hydrochloric acid (7 + 5, 1 + 4, 1 + 10)

5.2.2 Nitric acid

5.2.3 Perchloric acid

5.2.4 Hydrofluoric acid

5.2.5 Sulfuric acid (1 + 1)

5.2.6 Mixed acid (hydrochloric acid 1 + nitric acid 3) Shall be prepared at each service.

5.2.7 Aqueous ammonia (1 + 1)

5.2.8 Iron Shall be 99.9 % (mass fraction) or over in purity and 0.02 % or under in aluminium content.

5.2.9 Sodium disulfate

5.2.10 Ammonium acetate solution (50 g/L)

5.2.11 4-methyl-2-pentanone solution 940 ml of 4-methyl-2-pentanone and 60 ml of hydrochloric acid shall be mixed.

5.2.12 0.01 mol/L EDTA2Na solution Preparation, standardization and calculation method shall be in accordance with c) 3) of JA.5.2 of JIS K 8001.