

JIS

Methods for Atomic Absorption Spectrometric Analysis of Aluminium and Aluminium Alloys

JIS H 1306:1999

Modified on August 20, 1999

Reviewed by Japanese Industrial Standards Committee

(Issued by Japanese Standards Association)

Foreword

The standard is the Japanese Industrial Standard modified by the Minister of International Trade and Industry according to the provisions of the Industrial Standardization Law, after being reviewed by Japanese Industrial Standards Committee. According to the above procedures, we modified JIS H 1306:1992 and replaced the above industrial standards.

This modification integrated the international standards ISO 3256:1977 (Aluminium and aluminium alloys-Determination of magnesium-Atomic absorption spectrophotometric method) and ISO 5194:1981 (Aluminium and aluminium alloys-Determination of zinc content-Flame atomic absorption spectrophotometric method) for magnesium and zinc, which are the components of the nine quantitative elements used for implementing the test on the methods for atomic absorption spectrographic analysis. It also stipulated the quantitative method of iron, manganese and bismuth that did not stipulate in the International Standard additionally.

Besides, it did not adopt the quantitative methods of the methods for atomic absorption spectrographic analysis of four elements stipulated in ISO 3980 (quantitative of copper), ISO 3981 (quantitative of nickel), ISO 4192 (quantitative of lead) and ISO 4193 (quantitative of chrome), for it needs mercury in the decomposition of samples, which will be stipulated in other methods.

Competent minister: Minister of International Trade and Industry Formulated: May 1, 1974 Modified: August 20, 1999

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Formulation department of the original scheme: Aggregate Corporation Japan Aluminium Association

Review Branch: Japanese Industrial Standards Committee Nonferrous Metal Branch (President of the Branch Akihiko Kamio)

Review specialized committee: Specialized Committee of Iron and Steel Technology (Chairman of the Committee Nagai Kotobu)

For the suggestions and questions of the standard, please contact the Promotion Office of Standardization of Industrial Base of Ministry of Standard's Standard Business Department in Industrial Technology Institute (TEL100-8921, Room 3-1, 1 Chome, Chiyoda Ward Kasumigaseki, Tokyo Metropolis).

In addition, according to the provisions of Article 15 of the Industrial Standardization Law, Japanese Industrial Standards must be submitted to the Japanese Industrial Standards Committee for review within five years (shall not exceed 5 years), and then confirm, modify or abolish the standard timely according to the review results.

Japanese Industrial Standards

JIS

H 1306:1999

Methods for atomic absorption spectrometric analysis of aluminium and aluminium alloys

Introduction

The international standards which corresponding to the standard are ISO 3256 (Aluminium and aluminium alloys-Determination of magnesium-Atomic absorption spectrophotometric method), ISO 3980 (Aluminium and aluminium alloys-Determination of copper-Atomic absorption spectrophotometric method), ISO 3981 (Aluminium and aluminium alloys-Determination of nickel-Atomic absorption spectrophotometric method) initially issued in 1977 and ISO 4192 (Aluminium and aluminium alloys-Determination of lead content-Flame atomic absorption spectrophotometric method), ISO 4193 (Aluminium and aluminium alloys-Determination of chromium content-Flame atomic absorption spectrophotometric method), ISO 5194 (Aluminium and aluminium alloys-Determination of zinc content-Flame atomic absorption spectrophotometric method) initially issued in 1981; among which, the standards of ISO 3980, ISO 3981, ISO 4192 and ISO 4193 has not been adopted, for it needs mercury in the decomposition of samples; the corresponding parts of ISO 3256 and ISO 5194 retained their original technical contents and became the Japanese Industrial Standards directly.

Besides, it also formulated the international standard corresponding to iron, manganese and bismuth that did not formulate in the international standard, and it also additionally stipulated the quantitative method of methods for atomic absorption spectrographic analysis of

1. Scope

The standard stipulates the Methods for atomic absorption spectrometric analysis of aluminium and aluminium alloys.

Remarks and the international standards corresponding to the standard are as follows:

ISO 3256:1977 Aluminium and aluminium alloys-Determination of magnesium-Atomic absorption spectrophotometric method

ISO 3980:1977 Aluminium and aluminium alloys-Determination of copper-Atomic absorption spectrophotometric method

ISO 3981:1977 Aluminium and aluminium alloys-Determination of nickel-Atomic absorption spectrophotometric method

ISO 4192:1981 Aluminium and aluminium alloys-Determination of lead content-Flame atomic absorption spectrophotometric method

ISO 4193:1981 Aluminium and aluminium alloys-Determination of chromium content-Flame atomic absorption spectrophotometric method

ISO 5194:1981 Aluminium and aluminium alloys-Determination of zinc content-Flame atomic absorption spectrophotometric method

2. Normative references

The following standards become a part of the standard after being quoted, and these quoted standards apply to the latest edition.

JIS H 1351 General rules for chemical analysis of aluminium and aluminium alloy

JIS K0121 General rules for atomic absorption spectrometry

3. General matter

General matter common to the chemical analysis shall be in accordance with JIS H 1351 and JIS K 0121.

4. Determining elements and determining ranges

The determining elements and the determining ranges shall be as given in Table 1.

Table 1—Determining elements and determining ranges

Determining element	Determining range % (m/m)
Iron	0,005 or over to and excl. 1,5
Copper	0,005 or over to and excl. 5,0
Manganese	0,005 or over to and excl. 1,5
Zinc	0,005 or over to and excl. 6,0
Magnesium	0,005 or over to and excl. 5,0
Chromium	0,01 or over to and excl. 0,5
Nickel	0,005 or over to and excl. 3,0
Bismuth	0,1 or over to and excl. 1,0
Lead	0,1 or over to and excl. 1,0

NOTE: In table 1, The quantitative range, accuracy and precision can expand to the lower limiting value of about 0.002% (in/in)

5. Method for determination of iron

5.1 Summary

After decomposing a sample with hydrochloric acid and hydrogen peroxide, atomize the solution into the air-acetylene flame of an atomic absorption photometer, and measure the absorbance.

5.2 Reagents

The reagents shall be as follows:

- a) Hydrochloric acid (1+1)
- b) Nitric acid (1+1)
- c) Hydrofluoric acid
- d) Aluminium, aluminium of which the purity is as high as possible without containing iron, or aluminium of which the iron content is known and is as low as possible.
- e) Hydrogen peroxide
- f) Tin solution; Weigh out 0.1g of tin [99.9% (m/m)] or over, transfer into a beaker (200ml), add 30ml of hydrochloric acid (1+1), and decompose by heating at 50°C to 80°C making platinum contact therewith. After cooling to ordinary temperature, make

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