



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS M 8219-2 : 2012

(JISF)

**Iron ores — Determination of titanium —
Part 2: Diantipyrylmethane spectropho-
tometric method**

ICS 73.060.10

Reference number : JIS M 8219-2 : 2012 (E)

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Date of Establishment: 2012-04-20

Date of Public Notice in Official Gazette: 2012-04-20

Investigated by: Japanese Industrial Standards Committee
Standards Board

Technical Committee on Iron and Steel

JIS M 8219-2 : 2012, First English edition published in 2014-06

Translated and published by: Japanese Standards Association
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In the event of any doubts arising as to the contents,
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Printed in Japan

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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 for establishment of Japanese Industrial Standard submitted by The Japan Iron and Steel Federation (JISF) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

Consequently **JIS M 8219:1995** has been withdrawn and partially replaced with this Standard.

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JIS M 8219 series consists of the following 2 parts under the general title “*Iron ores — Determination of titanium —*”:

Part 1: Flame atomic absorption spectrometric method

Part 2: Diantipyrylmethane spectrophotometric method

Iron ores — Determination of titanium —

Part 2 : Diantipyrylmethane spectrophotometric method

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of **ISO 4691** published in 2009 with some modifications of the technical contents such as operation, marking of final report, etc.

The portions with continuous sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies the determination method of titanium in iron ores according to the diantipyrylmethane spectrophotometric method. This method is applicable to the determination of titanium whose content rate (mass fraction) is 0.02 % or over up to and including 4.0 %.

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows :

ISO 4691 : 2009 *Iron ores — Determination of titanium — Diantipyrylmethane spectrophotometric method* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

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 M 8202 *Iron ores — General rules for chemical analysis*

JIS Z 8402-6 *Accuracy (trueness and precision) of measurement methods and results — Part 6 : Use in practice of accuracy values*

3 General matters

General matters common to the determination method of iron ores shall be as specified in JIS M 8202.

4 Summary

The sample shall be decomposed with acid decomposition method, alkali sintering

method or alkali fusion method, and iron shall be reduced with ascorbic acid. It is coloured by adding diantipyrylmethane and the absorbance in the neighbourhood of 385 nm in wavelength shall be measured by using a spectrophotometer.

The summary of each decomposition method shall be as follows.

- a) **Acid decomposition method** Decomposed with hydrochloric acid, nitric acid and sulfuric acid, then filtered. The residue shall be treated with hydrofluoric acid and sulfuric acid, and fused with potassium disulfate, and the melt shall be dissolved with the filtrate.
- b) **Alkali sintering method** Sintered with sodium peroxide, then decomposed with hydrochloric acid and sulfuric acid. After the decomposition, the solution shall be filtered. The residue shall be treated with hydrofluoric acid and sulfuric acid, and fused with potassium disulfate, and the melt shall be dissolved with filtrate.
- c) **Alkali fusion method** Fused with fusing mixture of sodium tetraborate and sodium carbonate, and the melt shall be dissolved with hydrochloric acid. This method is not applicable to the sample of silicon content rate (mass fraction) exceeding 8 %.

5 Reagents

Reagents shall be as follows.

5.1 Hydrochloric acid

5.2 Hydrochloric acid (1 + 1, 1 + 4)

5.3 Nitric acid

5.4 Hydrofluoric acid

5.5 Sulfuric acid (1 + 1, 2 + 98)

5.6 Sodium peroxide of fine powder

5.7 Potassium disulfate

5.8 Fusing mixture

Sodium tetraborate (anhydride) and sodium carbonate shall be mixed by the mass ratio of 1 : 1, and preserved in an airtight container.

5.9 Ammonium iron (III) sulfate solution (100 mg/ml)

Add 100 g of ammonium iron (III) sulfate-dodecahydrate to the solution prepared by adding 5 ml of sulfuric acid (1 + 1) to 500 ml of water and dissolve it, and dilute it to 1 000 ml with water.

5.10 L (+)-ascorbic acid solution (100 mg/ml)

This solution shall be prepared at each service.

5.11 Diantipyrylmethane solution (15 mg/ml)

Dissolve 15 g of diantipyrylmethane monohydrate in about 300 ml of water and 30