



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS G 1314-1 : 2011

(JFA/JSA)

**Method for chemical analysis of
silicomanganese — Part 1: Determination
of manganese content**

ICS 77.100

Reference number : JIS G 1314-1 : 2011 (E)

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Date of Establishment: 2011-10-20

Date of Public Notice in Official Gazette: 2011-10-20

Investigated by: Japanese Industrial Standards Committee
Standards Board
Technical Committee on Iron and Steel

JIS G 1314-1 : 2011, First English edition published in 2013-06

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

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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 Ferroalloy Association (JFA)/ Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

Consequently JIS G 1314:1998 has been withdrawn and partially replaced with this Standard.

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JIS G 1314 series consists of the following 6 parts under the general title "*Method for chemical analysis of silicomanganese*":

Part 1: Determination of manganese content

Part 2: Determination of silicon content

Part 3: Determination of carbon content

Part 4: Determination of phosphorus content

Part 5: Determination of sulfur content

Part 6: Determination of boron content

Method for chemical analysis of silicomanganese —

Part 1 : Determination of manganese content

Introduction

This Japanese Industrial Standard has been prepared based on the first edition of **ISO 4159** published in 1978 with some modifications of the technical contents to correspond to the progress in analysis technology.

The portions given 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 manganese content in silicomanganese.

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

ISO 4159 : 1978 *Ferromanganese and ferrosilicomanganese — Determination of manganese content — Potentiometric 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 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 chemical analysis method shall be in accordance with JIS G 1301.

4 Classification of determination method

The determination method of manganese content shall be according to any of the following.

a) Potassium permanganate visual titration method This method is applicable to

the sample of which the manganese content rate is 55 % (mass fraction) or over up to and including 80 % (mass fraction).

- b) **Potassium permanganate potentiometric method** This method is applicable to the sample of which the manganese content rate is 55 % (mass fraction) or over up to and including 95 % (mass fraction).
- c) **Disodium ethylenediaminetetraacetate dihydrate titration method** This method is applicable to the sample of which the manganese content rate is 55 % (mass fraction) or over up to and including 80 % (mass fraction).

5 Potassium permanganate visual titration method

5.1 Summary

Decompose the sample with nitric acid and hydrofluoric acid, add sulfuric acid, generate white fume of sulfuric acid by heating, and remove nitric acid. Neutralize with zinc oxide, remove iron, etc., and titrate it with potassium permanganate solution.

5.2 Reagents

Reagents shall be as follows.

5.2.1 Hydrochloric acid (1 + 1)

5.2.2 Nitric acid

5.2.3 Hydrofluoric acid

5.2.4 Sulfuric acid (1 + 1)

5.2.5 Sodium disulfate

5.2.6 Zinc oxide milk Add about 100 ml of water to about 20 g of zinc oxide and stir to make them milky.

5.2.7 0.02 mol/L potassium permanganate solution The preparation, storage and standardization method shall be in accordance with g) in JA.5.2 of JIS K 8001.

5.3 Amount of test portion

The test portion shall be 0.10 g weighed out to the digit of 0.1 mg.

5.4 Procedure

5.4.1 Preparation of sample solution

The preparation of sample solution shall be carried out according to the following procedure.

- a) Weigh out the sample, transfer it to a platinum dish (No. 100) or a polytetrafluoroethylene (hereafter referred to as "PTFE") beaker (100 ml), and place a platinum or PTFE cover.
- b) Slide the cover a little, add 15 ml of nitric acid, and decompose it by dripping several drops of hydrofluoric acid step by step. When the reaction becomes vigorous, cool the outside of the container with water.