International Standard

ISO 9681

Manganese ores and concentrates — Determination of iron content — Flame atomic absorption spectrometric method

Minerais et concentrés de manganèse — Dosage du fer — Méthode par spectrométrie d'absorption atomique dans la flamme

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Sample Document

This document was prepared by Technical Committee ISO/TC 132, *Ferroalloys.*

This second edition cancels and replaces the first edition (ISO 9681:1990), which has been technically revised.

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The main changes are as follows:

— in 5.15 and 5.16 (previously in 4.13), the concentration of the iron standard solution has been changed;

— in 6.5 (previously in 5.3), the reference value of instrument parameters setting has been deleted;

— in 8.1 (previously in 7.1), the mass of the sample has been changed, and the requirement of parallel measurement times has been increased;

— in 8.2 (previously in 7.2), the mass of manganese in the blank experiment has been changed;

— in 8.3, the residue treatment has been included in the sample decomposition step, and 7.3.1 and 7.3.2 have been combined into 8.3.1;

— in 8.3.1 (previously in 7.3.1 and 7.3.2), the times of washing beaker and filter paper with hot hydrochloric acid have been specified, the steps for heating and drying filter paper and residue on electric furnace have been added, the time range of the residue melting and the volume of the beaker have been defined, and the amount of hydrochloric acid used has been changed;

— in 8.4 (previously in 7.4), the concentration of the calibration solution has been changed;

— in 9.2 (previously in 8.2), the paragraph of the "permissible tolerances on results of parallel determinations" has been replaced with the "general treatment of results";

— in Clause 10, the test report has been added;

— Annex A "Additional information on the international interlaboratory test" has been added;

— Annex B "Flow chart for the acceptance procedure of test results" has been added.

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Manganese ores and concentrates — Determination of iron content — Flame atomic absorption spectrometric method

1 Scope

This document specifies a flame atomic absorption spectrometric method for the determination of iron content in manganese ores and concentrates.

This document is applicable to iron content from 0,20 % (mass fraction) to 10,00 % (mass fraction), inclusive.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 310, *Manganese ores and concentrates — Determination of hygroscopic moisture content in analytical samples — Gravimetric method*

ISO 648, *Laboratory glassware — Single-volume pipettes*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 4296-1, *Manganese ores — Sampling — Part 1: Increment sampling*

ISO 4296-2, *Manganese ores — Sampling — Part 2: Preparation of samples*

ISO 4297, *Manganese ores and concentrates — Methods of chemical analysis — General instructions*

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3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Principle

Method 1: Decompose the test portion by treating with hydrochloric, perchloric and hydrofluoric acids. Separate the insoluble residue, fuse the residue with a fusion mixture, and dissolve the cooled melt in the test solution. Aspirate the test solution into an air-acetylene flame in an atomic absorption spectrometer and measure the absorbance at a wavelength of 248,3 nm or 344,06 nm.

Method 2: Decompose the test portion by treatment with hydrochloric, nitric and perchloric acids and filter the insoluble residue. Remove silica by volatilization with sulfuric and hydrofluoric acids, fuse the residue with a fusion mixture, and dissolve the cooled melt in the test solution. Aspirate the test solution into an air-acetylene flame in an atomic absorption spectrometer and measure the absorbance at a wavelength of 248,3 nm or 344,06 nm.

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