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BS ISO 15633:2015



BSI Standards Publication

Iron ores — Determination of nickel — Flame atomic absorption spectrometric method

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This British Standard is the UK implementation of ISO 15633:2015. It supersedes BS ISO 15633:2009 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/58, Iron ores.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Iron ores — Determination of nickel — Flame atomic absorption spectrometric method

*Minerais de fer — Dosage du nickel — Méthode par spectrométrie
d'absorption atomique dans la flamme*



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Contents

Page

| | |
|--|-----------|
| Foreword | iv |
| Introduction | v |
| 1 Scope | 1 |
| 2 Normative references | 1 |
| 3 Principle | 1 |
| 4 Reagents | 1 |
| 5 Apparatus | 2 |
| 6 Sampling and samples | 3 |
| 6.1 Laboratory sample..... | 3 |
| 6.2 Preparation of predried test samples..... | 3 |
| 7 Procedure | 4 |
| 7.1 Number of determinations..... | 4 |
| 7.2 Test portion..... | 4 |
| 7.3 Blank test and check test..... | 4 |
| 7.4 Determination..... | 4 |
| 7.4.1 Decomposition of the test portion..... | 4 |
| 7.4.2 Removal of iron..... | 5 |
| 7.4.3 Treatment of the residue..... | 5 |
| 7.4.4 Preparation of the calibration solutions..... | 5 |
| 7.4.5 Adjustment of the atomic absorption spectrometer..... | 6 |
| 7.4.6 Atomic absorption measurements..... | 6 |
| 8 Expression of results | 6 |
| 8.1 Calculation of sulfur content..... | 6 |
| 8.2 General treatment of results..... | 7 |
| 8.2.1 Repeatability and permissible tolerance..... | 7 |
| 8.2.2 Determination of analytical result..... | 7 |
| 8.2.3 Between-laboratories precision..... | 7 |
| 8.2.4 Check for trueness..... | 8 |
| 8.2.5 Calculation of final result..... | 9 |
| 8.3 Oxide factor..... | 9 |
| 9 Test report | 9 |
| Annex A (normative) Flowsheet of the procedure for the acceptance of analytical values for test samples | 10 |
| Annex B (informative) Derivation of repeatability and permissible tolerance equations | 11 |
| Annex C (informative) Precision data obtained by international analytical trial | 12 |
| Bibliography | 13 |

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary Information](#)

The committee responsible for this document is ISO/TC 102, *Iron ore and direct reduced iron*, Subcommittee SC 02, *Chemical analysis*.

This second edition cancels and replaces the first edition (ISO 15633:2009), which has been technically revised.

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Introduction

The objective of a proposed revision of ISO 9685:1991 was to extend the lower limit for a flame atomic absorption spectrometric method determination of both chromium and nickel in iron ores down to 0,001 %. However, due to bias, the method for nickel could not be approved for referee purposes.

The 22nd meeting of ISO/TC 102/SC 2 decided to progress this International Standard as a non-referee method.

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WARNING — This International Standard may involve hazardous materials, operations, and equipment. This International Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this International Standard to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This International Standard specifies a flame atomic absorption spectrometric method for the determination of the nickel mass fraction of iron ores.

This method is applicable to mass fractions of nickel between 0,001 % and 0,1 % in natural iron ores, iron ore concentrates, and agglomerates including sinter products.

This method is not appropriate for referee purposes.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

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

ISO 3082, *Iron ores — Sampling and sample preparation procedures*

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

ISO 7764, *Iron ores — Preparation of predried test samples for chemical analysis*

ISO 80000-1:2009, *Quantities and units — Part 1: General*

3 Principle

The test portion of iron ore is decomposed by treatment with hydrochloric and nitric acids.

The major portion of iron in the filtrate is removed by extraction with 4-methylpentan-2-one.

The insoluble residue is ignited and silicon dioxide is removed by evaporation with hydrofluoric and sulfuric acids. The residue is fused with a mixture of sodium carbonate and sodium tetraborate, and then dissolved with hydrochloric acid and combined with the main solution.

The solution is aspirated into the flame of an atomic absorption spectrometer using an air-acetylene burner. The absorbance values obtained are compared with those obtained from the calibration solutions.

4 Reagents

During the analysis, use only reagents of recognized analytical grade and only water that conforms to grade 2 of ISO 3696.