INTERNATIONAL STANDARD

ISO 11534

Second edition
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Iron ores — Determination of tin — Flame atomic absorption spectrometric method

Minerais de fer — Dosage de l'étain — Méthode par spectrométrie d'absorption atomique dans la flamme

Reference number
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 11534 was prepared by Technical Committee ISO/TC 102, *Iron ore and direct reduced iron*, Subcommittee SC 2, *Chemical analysis*.

This second edition cancels and replaces the first edition (ISO 11534:1998), which has been technically revised. It has been updated to alter the manner in which the precision data are presented.

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

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 mass fraction of tin in iron ores.

This method is applicable to mass fractions of tin between 0,001 % and 0,015 % in natural iron ores, iron ore concentrates and agglomerates, including sinter products.

2 Normative references

The following referenced documents are indispensable for the application 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 648: *Laboratory glassware — One-mark 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*

3 Principle

The test portion is treated with sulfuric acid and hydrofluoric acid in a platinum crucible. The silica is removed by heating and evaporation. The residue is fused in sodium carbonate/sodium tetraborate flux, and the cooled melt is dissolved in hydrochloric acid.

Iron is reduced by ascorbic acid and potassium iodide, followed by extraction of tin with tri-*n*-octyl phosphine oxide (TOPO) in 4-methyl-2-pentanone (MIBK) solvent.

The tin TOPO/MIBK extract is aspirated into a dinitrogen oxide/acetylene flame and the absorbance of tin is measured at a 286,3 nm resonance line using a tin hollow-cathode lamp. The absorbance values obtained are compared with those obtained from calibration solutions.