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Iron ores — Determination of loss on ignition — Gravimetric method

Minerais de fer — Détermination de la perte au feu — Méthode gravimétrique

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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.

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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 2, *Chemical analysis*.

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Introduction

The measurement of loss on ignition (LOI) is a technique widely used in the iron ore industry. Ignition loss is the sum of contributions from the mass loss of volatile compounds water vapour, carbon dioxide and sulfides (due to the decomposition of goethite and carbonaceous materials), and the mass gain due to oxidation [Fe(II) to Fe_2O_3]. Its use is complementary to the determination of elemental or oxide concentrations. It serves to allow for an addition of the oxides, generated at the ignition temperature, and the LOI, to arrive at total (oxide + LOI). The determination of LOI is essential in sinter plant and blast furnace balance calculations, as it is used to calculate calcinated elemental concentrations.

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Iron ores — Determination of loss on ignition — Gravimetric 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 gravimetric method for the determination of the loss in mass of fully-oxidized iron ores, when ignited at 1 000 °C.

This method is applicable to a concentration range of 1,0 % (m/m) to 10,0 % (m/m) loss on ignition in natural iron ores, iron ore concentrates and agglomerates.

The method is not applicable to the following:

a) Processed ores containing metallic iron (direct reduced iron);

b) Natural or processed ores in which the sulfur content is higher than 0,2 % (m/m);

c) Natural or processed ores in which the content of partially-oxidized iron is more than 1,0 % (m/m).

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 2596, *Iron ores — Determination of hygroscopic moisture in analytical samples — Gravimetric, Karl Fischer and mass-loss methods*

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

3 Principle

A test portion is heated in a muffle furnace at 1 000 °C for 60 min and cooled in a desiccator (5.4). The mass loss of the test portion is determined, and expressed as a mass fraction percentage relative to the original weight.

4 Reagents

During the analysis, use only reagents of recognized analytical grade.

4.1 Silica gel, dried at 105 °C for 4 h.

5 Apparatus

Ordinary laboratory apparatus and, in particular, the following:

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