INTERNATIONAL STANDARD

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Aluminium ores — Determination of total iron content — Titanium trichloride reduction method

Minerais alumineux — Dosage du fer — Méthode de réduction au trichlorure de titane

Reference number
ISO 10213:1991(E)

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.

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.

International Standard ISO 10213 was prepared by Technical Committee ISO/TC 129, *Aluminium ores*, Sub-Committee SC 2, *Methods of analysis*.

Annex A forms an integral part of this International Standard. Annex B is for information only.

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Aluminium ores — Determination of total iron content — Titanium trichloride reduction method

1 Scope

This International Standard specifies a titrimetric method, free from mercury pollution, for the determination of the total iron content in aluminium ores, using potassium dichromate as titrant after reduction of the trivalent iron by tin(II) chloride and titanium(III) chloride. The excess reductant is then oxidized by perchloric acid.

The method is applicable to ores containing between 2 % (*m*/*m*) and 50 % (*m*/*m*) of iron oxide (Fe_2O_3).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5725:1986, *Precision of test methods — Determination of repeatability and reproducibility for a standard test method by inter-laboratory tests.*

ISO 6140:1991, *Aluminium ores — Preparation of samples.*

ISO 8558:1985, *Aluminium ores — Preparation of pre-dried test samples.*

ISO 8685:—[1], *Aluminium ores — Sampling procedures.*

1) To be published.

3 Principle

Decomposition of the test portion by sintering with sodium peroxide followed by a brief fusion. Dissolution of the melt in water and hydrochloric acid. Reduction of the major portion of the iron(III) by tin(II) chloride and reduction of the remainder of the iron by titanium(III) chloride. Oxidation of the excess reductant with dilute perchloric acid. Titration of the reduced iron with potassium dichromate solution using sodium diphenylaminesulfonate indicator.

4 Reagents

During the analysis, use only reagents of recognized analytical reagent grade, and only distilled water or water of equivalent purity.

4.1 Sodium peroxide, dry powder.

WARNING — Sodium peroxide should be protected against humidity when stored and should not be used once it has begun to agglomerate.

4.2 Hydrochloric acid, ρ_{20} between 1,16 g/ml and 1,19 g/ml.

4.3 Hydrochloric acid, ρ_{20} between 1,16 g/ml and 1,19 g/ml, diluted 1 + 10.

4.4 Perchloric acid, 72 % (*m*/*m*) (ρ_{20} = 1,67 g/ml), diluted 1 + 1.

4.5 Sulfuric acid-phosphoric acid mixture.

Pour 150 ml of phoshoric acid (ρ_{20} = 1,70 g/ml) into about 400 ml of water while stirring, add 150 ml of sulfuric acid (ρ_{20} = 1,84 g/ml), cool in a water bath and dilute with water to 1 litre.

4.6 Potassium permanganate, 25 g/l solution.