

Analysis of iron ores —

Part 20: Method for the determination of water soluble chloride content: ion-selective electrode method

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Iron and Steel Standards Policy Committee (ISM/-) to Technical Committee ISM/58, upon which the following bodies were represented:

- British Steel Industry
- Institution of Mining and Metallurgy
- Coopted members

The following body was also represented in the drafting of the standard, through subcommittees and panels:

- British Ceramic Research Ltd

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National foreword

This Part of BS 7020 has been prepared under the direction of the Iron and Steel Standards Policy Committee. It is identical with ISO 9517:1989 “*Iron ores — Determination of water soluble chloride content — Ion-selective electrode method*” published by the International Organization for Standardization (ISO).

Cross-references

International Standard	Corresponding British Standard
ISO 1042:1983	BS 1792:1982 <i>Specification for one-mark volumetric flasks</i> (Identical) BS 5660 <i>Methods of sampling iron ores</i>
ISO 3081:1986	Part 1:1987 <i>Manual method of increment sampling</i> (Identical)
ISO 3082:1987	Part 2:1987 <i>Mechanical method of increment sampling and sample preparation</i> (Identical)
ISO 3083:1986	BS 5661:1987 <i>Method for preparation of samples of iron ores by manual means</i> (Identical)
ISO 7764:1985	BS 7020 <i>Analysis of iron ores</i> Part 1:1988 <i>Method for the preparation of pre-dried test samples for chemical analysis</i> (Identical)

The Technical Committee has reviewed the provisions of ISO 648 to which reference is made in the text and has decided that they are acceptable for use in conjunction with this standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This International Standard specifies an ion-selective electrode method for the determination of the water soluble chloride content of iron ores. This method is applicable to a concentration range of 0,005 % (m/m) to 0,1 % (m/m) of water soluble chloride in natural iron ores, and concentrates and agglomerates including sinter products.

NOTE Water soluble chloride is that part of the chloride content of an iron ore extractable by leaching with aqueous solution under substantially neutral conditions.

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 648:1977, *Laboratory glassware — One-mark pipettes*.

ISO 1042:1983, *Laboratory glassware — One-mark volumetric flasks*.

ISO 3081:1986, *Iron ores — Increment sampling — Manual method*.

ISO 3082:1987, *Iron ores — Increment sampling and sample preparation — Mechanical method*.

ISO 3083:1986, *Iron ores — Preparation of samples — Manual method*.

ISO 7764:1985, *Iron ores — Preparation of predried test samples for chemical analysis*.

3 Principle

Digestion of the test portion in water containing potassium sulfate, transfer of the suspension to a volumetric flask and dilution to volume. Dry filtration, treatment of an aliquot with potassium persulfate solution and addition of neutral buffer. Addition of ionic strength adjuster solution and potentiometric determination of chloride concentration using a chloride ion electrode and a double junction reference electrode.

4 Reagents

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

The preparation of reagent and calibration solutions and all operations specified in 5, 6 and 7 in this method shall be conducted in an area adequately isolated from any areas in which hydrochloric acid is used.

4.1 Potassium sulfate (K_2SO_4) solution, 2 g/l.

4.2 Potassium sulfate (K_2SO_4) solution, 4 g/l.

4.3 Potassium persulfate ($K_2S_2O_8$) solution, 1,5 g/100 ml.

Prepare freshly for each series of tests.

4.4 Sodium nitrate, solution $c(NaNO_3) = 5$ mol/l.

Dissolve 42,5 g of sodium nitrate in about 60 ml of water, transfer to a 100 ml volumetric flask, dilute to volume and mix.

4.5 Phosphate buffer solution

Dissolve 2,72 g of potassium dihydrogen phosphate (KH_2PO_4) and 2,84 g of disodium hydrogen phosphate (Na_2HPO_4) in 40 ml of water. Transfer to a 100 ml volumetric flask, dilute to volume and mix.

4.6 Stirring bar cleaning solution

Add carefully to about 700 ml of water, 150 ml of sulfuric acid (ρ 1,84 g/ml) and 150 ml of phosphoric acid (ρ 1,7 g/ml) and mix.

4.7 Chloride standard solution A, 1 000 μ g Cl/ml.

Dry about 2 g of sodium chloride at 105 °C for 1 h and cool in a desiccator. Weigh 0,824 g of the dried material, dissolve in about 50 ml of water and transfer to a 500 ml volumetric flask. Dilute to volume and mix.

1 ml of chloride standard solution A contains 1 000 μ g of chloride.

4.8 Chloride standard solution B, 50 μ g Cl/ml.

Measure 25,0 ml of chloride standard solution A into a 500 ml volumetric flask, dilute to volume and mix.

1 ml of chloride standard solution B contains 50 μ g of chloride.

4.9 Chloride standard solution C, 20 μ g Cl/ml.

Measure 10,0 ml of chloride standard solution A into a 500 ml volumetric flask, dilute to volume and mix.

1 ml of chloride standard solution C contains 20 μ g of chloride.

NOTE Standard solutions B (4.8) and C (4.9) should be freshly prepared.

4.10 Calibration solutions

Prepare the calibration solutions specified in Table 1 for the expected range of chloride content.