
International Standard



4690

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Iron ores — Determination of sulfur content — Combustion method

Minerais de fer — Dosage du soufre — Méthode par combustion

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4690 was prepared by Technical Committee ISO/TC 102, *Iron ores*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Iron ores — Determination of sulfur content — Combustion method

1 Scope and field of application

This International Standard specifies a combustion method for the determination of the sulfur content of iron ores.

This method is applicable to a concentration range of 0,002 to 0,25 % (*m/m*) of sulfur in natural iron ores, and iron ore concentrates and agglomerates including sinter products. The results are not affected by the presence of fluoride.

2 References

ISO 385/1, *Laboratory glassware — Burettes — Part 1: General requirements*.

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

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

ISO 3082, *Iron ores — Increment sampling and sample preparation — Mechanical method*.¹⁾

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

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

3 Principle

Mixing of the sample with tungstic oxide and heating at 1 200 °C in a resistance furnace, using nitrogen as a carrier gas.

Absorption of the evolved sulfur dioxide in dilute hydrochloric acid solution containing starch and potassium iodide, and titration of the solution continuously during the evolution with a standard volumetric solution of potassium iodate.

4 Reagents

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

4.1 Magnesium perchlorate [$\text{Mg}(\text{ClO}_4)_2$], anhydrous, free flowing, particle size 0,5 to 2 mm.

4.2 Tungsten(VI) oxide (WO_3).

4.3 Tin(II) chloride ($\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$), particle size 0,5 to 2 mm.

4.4 Soda-asbestos, particle size 0,5 to 2 mm.

4.5 Hydrochloric acid, ρ 1,16 to 1,19 g/ml, diluted 1 + 66.

4.6 Potassium iodide (KI), 3 % (*m/m*) solution.

4.7 Starch, 2 % (*m/m*) solution.

Make a suspension of 2,0 g of starch in 10 ml of water, add to 50 ml of boiling water and stir. Cool, dilute to 100 ml and mix.

Prepare this solution immediately prior to use.

4.8 Potassium iodate (KIO_3), standard volumetric solution, 0,001 042 mol/l.

NOTE — The potassium iodate should be previously dried for 1 h at 110 °C.

Weigh, to the nearest 0,000 2 g, 0,223 g of dried potassium iodate and dissolve in water. Cool, transfer to a 1 litre volumetric flask, make up to the mark and mix.

1 ml of this standard volumetric solution is equivalent to 0,10 mg of sulfur.

5 Apparatus

NOTE — Volumetric flasks shall comply with ISO 1042.

The apparatus is shown in figure 1.

5.1 Nitrogen supply.

5.2 Drying tower, containing soda-asbestos (4.4) and magnesium perchlorate (4.1).

1) At present at the stage of draft.