

INTERNATIONAL
STANDARD

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**Iron ores — Determination of total iron content
— Silver reduction titrimetric method**

Minerais de fer — Dosage du fer total — Méthode titrimétrique par réduction à l'argent



Reference number
ISO 9508 : 1990 (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 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 9508 was prepared by Technical Committee ISO/TC 102, *Iron ores*.

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

Iron ores — Determination of total iron content — Silver reduction titrimetric method

1 Scope

This International Standard specifies a method, free from mercury pollution, for the determination of total iron content in iron ores by silver reduction and potassium dichromate titration.

The method is applicable to a concentration range of 30 % (*m/m*) to 72 % (*m/m*) of iron in natural iron ores, iron ore concentrates and agglomerates, including sinter products, containing not more than 0,1 % (*m/m*) Cu. Contents of vanadium normally present in iron ores are without effect.

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 385-1: 1984, *Laboratory glassware — Burettes — Part 1: General requirements*.

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

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

ISO 2596: 1984, *Iron ores — Determination of hygroscopic moisture in analytical samples — Gravimetric and Karl Fischer methods*.

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

3.1 Fusion decomposition

Fusion of the test portion with sodium peroxide and leaching with water. Dissolution in hydrochloric acid and passing the solution through a silver reductor. Addition of orthophosphoric acid — sulfuric acid mixture and diphenylaminesulfonate indicator and determination of the total iron by titration with a standard solution of potassium dichromate.

3.2 Acid decomposition

Treatment of the test portion with hydrochloric acid. Filtration and ignition of the residue followed by treatment with hydrofluoric and sulfuric acids and fusion with potassium pyrosulfate. Dissolution of the melt in hydrochloric acid, precipitation of iron with ammonia solution and redissolution of the precipitate in hydrochloric acid. Combination of this solution with the main solution and passing this solution through a silver reductor. Addition of orthophosphoric acid-sulfuric acid mixture and diphenylaminesulfonate indicator and determination of the total iron by titration with a standard solution of potassium dichromate.

4 Reagents

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

4.1 Sodium peroxide (Na_2O_2).

NOTE — Sodium peroxide should be kept away from humidity and should not be used once it has begun to agglomerate.

4.2 Silver powder, 300 μm is suitable.

4.3 Zinc metal rods, about 8 mm in diameter and about 15 cm in length.

4.4 Potassium pyrosulfate ($\text{K}_2\text{S}_2\text{O}_7$), fine powder.

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

4.6 Hydrochloric acid, ρ 1,16 g/ml to 1,19 g/ml, diluted 1 + 2.