



Manganese ores — Determination of sulphur content — Barium sulphate gravimetric methods and sulphur dioxide titrimetric method after combustion

Minerais de manganèse — Dosage du soufre — Méthodes gravimétriques à l'état de sulfate de baryum et méthode titrimétrique à l'état de dioxyde de soufre après calcination

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

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.

International Standard ISO 320 was developed by Technical Committee ISO/TC 65, *Manganese and chromium ores*.

This second edition was submitted directly to the ISO Council, in accordance with clause 5.10.1 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the first edition (i.e. ISO 320-1975), which had been approved by the member bodies of the following countries :

Austria	Hungary	Portugal
Bulgaria	India	Romania
Chile	Ireland	South Africa, Rep. of
Czechoslovakia	Italy	Spain
Finland	Japan	United Kingdom
France	Netherlands	USSR
Germany, F. R.	Poland	

No member body had expressed disapproval of the document.

Manganese ores — Determination of sulphur content — Barium sulphate gravimetric methods and sulphur dioxide titrimetric method after combustion

1 Scope and field of application

This International Standard specifies three methods for the determination of the sulphur content of manganese ores :

- **Methods I and II** : barium sulphate gravimetric methods, which are applicable to manganese ores having sulphur contents greater than 0,01 % (m/m);
- **Method III** : sulphur dioxide titrimetric method after combustion.

This International Standard should be read in conjunction with ISO 4297.

2 References

ISO 4296/1, *Manganese ores — Sampling — Part 1 : Increment sampling*.¹⁾

ISO 4296/2, *Manganese ores — Sampling — Part 2 : Preparation of samples*.¹⁾

ISO 4297, *Manganese ores and concentrates — Methods of chemical analysis — General instructions*.

3 Method I : Gravimetric method (first variant)

3.1 Principle

Conversion of all the sulphur contained in a test portion of the ore (generally in the form of pyrites and barytes) into sulphates of sodium, by fusion of the ore with sodium carbonate and an oxidizing agent at a temperature of 800 to 900 °C. Extraction of the fusion with water, followed by filtration, to separate the sulphate ions from other inherent elements some of which hinder the determination. Precipitation of the sulphate ions contained in the filtrate with barium chloride and determination of the sulphur in the form of barium sulphate.

3.2 Reagents

3.2.1 Sodium carbonate, anhydrous.

3.2.2 Sodium peroxide.

3.2.3 Fusion mixture, consisting of 30 g of anhydrous sodium carbonate, 25 g of magnesium oxide and 2 g of potassium chlorate. Finely grind potassium chlorate with a small quantity of the anhydrous sodium carbonate (3.2.1) in a porcelain mortar. Then add the remaining quantity of sodium carbonate and magnesium oxide and mix well.

3.2.4 Ethanol.

3.2.5 Sodium carbonate, 10 g/l solution.

3.2.6 Hydrochloric acid, diluted 1 + 1.

3.2.7 Barium chloride, 100 g/l solution.

3.2.8 Washing solution.

Add 10 ml of barium chloride solution (3.2.7) to 10 ml of hydrochloric acid (3.2.6) and dilute to 1 litre with water.

3.2.9 Silver nitrate, 1 g/l solution.

3.2.10 Methyl red indicator, 1 g/l alcoholic solution.

3.3 Apparatus

Ordinary laboratory apparatus and

3.3.1 Platinum crucible (for procedure A) or

3.3.2 Nickel crucible (for procedure B).

3.3.3 Muffle furnace.

1) At present at the stage of draft.