
International Standard



316

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Manganese ores — Determination of cobalt content — Nitroso-R-salt photometric method

Minerais de manganèse — Dosage du cobalt — Méthode photométrique au sel nitroso-R

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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 316 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 316-1975), which had been approved by the member bodies of the following countries :

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

No member body had expressed disapproval of the document.

Manganese ores — Determination of cobalt content — Nitroso-R-salt photometric method

1 Scope and field of application

This International Standard specifies a photometric method, by complexing with nitroso-R-salt, for the determination of the cobalt content of manganese ores.

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 Principle

Reaction, in acetate solution, of the trivalent cobalt with nitroso-R-salt to form a coloured complex which tints the solution red. Elimination of the influence of interfering elements (iron, copper, nickel) by boiling the solution with nitric acid after addition of the nitroso-R-salt. Photometric measurement at a wavelength of 420 to 430 nm or 520 to 530 nm.

4 Reagents

4.1 Sodium carbonate, anhydrous.

4.2 Ammonium hydroxide, ρ 0,91 g/ml.

4.3 Nitric acid, diluted 1 + 1.

4.4 Hydrochloric acid, diluted 1 + 1.

4.5 Hydrochloric acid, ρ 1,19 g/ml.

4.6 Sulphuric acid, ρ 1,84 g/ml.

4.7 Hydrofluoric acid, 40 % (m/m).

4.8 Sodium acetate, 300 g/l solution.

4.9 Nitroso-R-salt, 1 g/l solution.

4.10 Cobalt, standard solution corresponding to 0,1 g of Co per litre.

Dissolve 0,100 0 g of metallic cobalt in 20 ml of hydrochloric acid, diluted 1 + 4, in the presence of a few drops of nitric acid (ρ 1,40 g/ml). Boil the solution until it ceases to evolve nitric oxides.

Place the solution thus obtained in a 1 000 ml one-mark volumetric flask, dilute to the mark with water and mix.

1 ml of this solution contains 0,000 1 g of Co.

5 Apparatus

Ordinary laboratory apparatus and

5.1 Platinum crucible.

5.2 Photoelectric absorptiometer, fitted with either a blue (wavelength 420 to 430 nm) or a green (wavelength 520 to 530 nm) light-filter.

6 Sample

For the sampling of manganese ores, see ISO 4296/1. For the preparation of samples, see ISO 4296/2.

Use a test sample which had been crushed to a size not exceeding 100 μ m (checked on a sieve of appropriate size) and air-dried under laboratory conditions.

1) At present at the stage of draft.