International Standard 621

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Manganese ores — Determination of metallic iron content (metallic iron content not exceeding 2 %) — Sulphosalicylic acid photometric method

Minerais de manganèse — Dosage du fer métallique (teneur en fer métallique inférieure ou égale à 2 %) — Méthode photométrique à l'acide sulfosalicylique

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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.

International Standard ISO 621 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 621-1975), which had been approved by the member bodies of the following countries:

Austria	Hungary	South Africa, Rep. of
Chile	India	Spain
Czechoslovakia	Italy	Switzerland
Egypt, Arab Rep. of	Korea, Rep. of	Turkey
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No member body had expressed disapproval of the document.

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Manganese ores — Determination of metallic iron content (metallic iron content not exceeding 2 %) — Sulphosalicylic acid photometric method

1 Scope and field of application

This International Standard specifies a photometric method, by complexing with sulphosalicylic acid, for the determination of the metallic iron content of manganese ores. The method is applicable to ores having metallic iron contents not exceeding 2 % (*m*/*m*).

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

Selective dissolution of the metallic iron in a methanolic solution of mercury(II) chloride and sodium salicylate. [The latter completely eliminates the formation of insoluble basic iron(III) salts and methanol prevents the dissolution of iron(III) oxide. The determination is unaffected by manganese oxide or other oxidants.]

Reaction, in acetate buffer solution, of the trivalent iron with sulphosalicylic acid to form a coloured complex which tints the solution yellow-brown.

Photometric measurement of the coloured complex at a wavelength of 420 to 430 nm.

4 Reagents

4.1 Hydrochloric acid, diluted 1 + 2.

4.2 Ammonium sulphosalicylate solution.

Dissolve 100 g of sulphosalicylic acid in 500 to 600 ml of water, neutralize, checking with an indicator paper (pH approximately 5), with ammonium hydroxide solution, diluted 1 + 1, filter, allow to cool, dilute with water to 1 000 ml and mix.

4.3 Buffer solution.

Dissolve 500 g of crystalline sodium acetate trihydrate ($CH_3CO_2Na.3H_2O$) in 500 ml of hot (60 to 70 °C) hydrochloric acid, diluted 1 + 4, filter, allow to cool, dilute with water to 1 000 ml and mix.

4.4 Solvent.

Dissolve 2,5 g of mercury(II) chloride and 3 g of sodium salicylate in 100 ml of methanol.

4.5 Iron, standard solution corresponding to 0,1 g of Fe per litre.

Dissolve 0,143 0 g of iron(III) oxide, previously calcined at a temperature of 750 to 800 °C, in 15 ml of hydrochloric acid, ϱ 1,19 g/ml, evaporate to 10 ml, transfer to a 1 000 ml one-mark volumetric flask, dilute to the mark with water and mix.

1 ml of this standard solution contains 0,000 1 g of iron.

5 Apparatus

Ordinary laboratory apparatus and

5.1 Photoelectric absorptiometer, fitted with a blue (wavelength 420 to 430 nm) light-filter.

1) At present at the stage of draft.

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