
INTERNATIONAL STANDARD



4159

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Ferromanganese and ferrosilicomanganese — Determination of manganese content — Potentiometric method

Ferro-manganèse et ferro-silico-manganèse — Dosage du manganèse — Méthode potentiométrique

First edition — 1978-12-15

Sample Document

get full document from standards.iteh.ai

UDC 669.15-198 : 543.257.1 : 546.711

Ref. No. ISO 4159-1978 (E)

Descriptors : ferroalloys, ferromanganese, chemical analysis, determination of content, manganese, potentiometric analysis.

Price based on 3 pages

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 4159 was developed by Technical Committee ISO/TC 132, *Ferrous alloys*, and was circulated to the member bodies in October 1977.

It has been approved by the member bodies of the following countries :

Australia	Iran	South Africa, Rep. of
Austria	Italy	Spain
Bulgaria	Japan	Sweden
Canada	Korea, Rep. of	Turkey
Czechoslovakia	Mexico	United Kingdom
France	Norway	U.S.A.
Germany, F.R.	Philippines	U.S.S.R.
India	Romania	Yugoslavia

The member body of the following country expressed disapproval of the document on technical grounds :

Poland

Ferromanganese and ferrosilicomanganese – Determination of manganese content – Potentiometric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a potentiometric method for the determination of the manganese content of ferromanganese and ferrosilicomanganese.

The method is applicable to alloys containing from 55 to 95 % (*m/m*) of manganese.

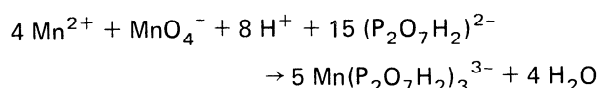
2 REFERENCE

ISO 3713, *Ferroalloys – Sampling and preparation of samples – General rules*.¹⁾

3 PRINCIPLE

Dissolution of a test portion with hydrochloric, hydrofluoric and perchloric acids.

Potentiometric determination (see note) of manganese with potassium permanganate in a pyrophosphoric medium at a controlled pH, according to the reaction :



NOTE — The method may be completed by any other electrometric method : amperometric titration, dead-stop, etc.

4 REAGENTS

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

4.1 Perchloric acid²⁾, ρ 1,61 g/ml.

4.2 Hydrofluoric acid, ρ 1,14 g/ml.

4.3 Hydrochloric acid, ρ 1,19 g/ml.

4.4 Hydrochloric acid, ρ 1,19 g/ml, diluted 1 + 2.

4.5 Hydrochloric acid, ρ 1,19 g/ml, diluted 1 + 4.

4.6 Sodium pyrophosphate, saturated solution.

Dissolve 145 g of sodium pyrophosphate ($\text{P}_2\text{O}_7\text{Na}_4 \cdot 10\text{H}_2\text{O}$) in a 2 litre conical flask, with about 1 litre of hot water; heat without exceeding, even locally, the temperature of 60 °C, until the salt is completely dissolved. Cool.

Prepare this solution at the time of use.

4.7 Potassium permanganate, recrystallized.

Place 50 g of pure analytical grade potassium permanganate in the conical flask (5.1), and dissolve it in 200 ml of warm distilled water (70 to 80 °C).

Fit the reflux condenser (5.2) to the flask and boil the solution for 20 min. Filter the warm solution quickly under vacuum through a sintered glass funnel (5.3).

Cool the filtrate in iced water, stirring vigorously, and allow the fine, crystalline precipitate to settle for 10 min.

Decant the solution; then, using a glass spatula, transfer the crystalline mass into a funnel with a filter plate, porosity 4, and place under suction for a few minutes to remove most of the mother liquor.

Dissolve the crystalline mass in 160 ml of distilled water (deionized water is not permitted for this phase), and repeat the recrystallization.

After filtering and placing under suction for approximately 5 min, transfer the crystalline mass onto a 150 mm diameter watch glass using a glass spatula, and dry it in air, protected from light and dust. When the crystalline mass no longer agglomerates when crushed with the spatula, dry it at 110 °C for 2 h, then transfer it to a weighing bottle fitted with a ground glass stopper.

Store in the dark.

This salt contains 34,76 % (*m/m*) of Mn.

1) At present at the stage of draft.

2) Attention is drawn to the hazards associated with perchloric acid when heated to fuming.