INTERNATIONAL STANDARD 4158

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Ferrosilicon, ferrosilicomanganese and ferrosilicochromium — Determination of silicon content — Gravimetric method

Ferrosilicium, ferro-silico-manganèse et ferro-silico-chrome — Dosage du silicium — Méthode gravimétrique

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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 4158 was developed by Technical Committee ISO/TC 132, *Ferroalloys*, and was circulated to the member bodies in October 1977.

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

Australia	Italy	Spain
Austria	Japan	Sweden
Bulgaria	Korea, Rep. of	Turkey
Canada	Mexico	United Kingdom
Czechoslovakia	Norway	U.S.A.
France	Philippines	U.S.S.R.
Germany, F.R.	Poland	Yugoslavia
India	Romania	
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No member body expressed disapproval of the document.

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Ferrosilicon, ferrosilicomanganese and ferrosilicochromium — Determination of silicon content — Gravimetric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a gravimetric method for the determination of the silicon content of ferrosilicon, ferrosilicomanganese and ferrosilicochromium.

The method is applicable to alloys containing from 8 to 95 % (*m/m*) of silicon.

2 REFERENCE

ISO 3713, *Ferroalloys — Sampling and preparation of samples — General rules.* [1]

3 PRINCIPLE

Transformation of the silicon in a test portion into silicate by oxidizing fusion with sodium peroxide and taking up with acid.

Double dehydration of the silicate by evaporation in a perchloric acid medium, and weighing of the impure silica.

Double hydrofluoric-sulphuric volatilization of the silica, weighing of the residue, and determination, by difference, of the pure silica.

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.

4.2 Sodium carbonate (anhydrous).

4.3 Ammonia solution, ρ 0,91 g/ml.

4.4 Perchloric acid[2], ρ 1,61 g/ml.

4.5 Hydrofluoric acid, ρ 1,14 g/ml.

4.6 Hydrochloric acid, ρ 1,19 g/ml.

4.7 Sulphuric acid, ρ 1,83 g/ml.

4.8 Hydrochloric acid, ρ 1,19 g/ml, diluted 1 + 9.

4.9 Sulphuric acid, ρ 1,83 g/ml, diluted 1 + 1.

4.10 Silver nitrate, 10 g/l solution.

5 APPARATUS

Usual laboratory equipment, and in particular :

5.1 Crucible, capacity 40 ml, of silicon-free iron, vitreous carbon, nickel or zirconium.

5.2 Beakers, for melt dissolution, of polytetrafluoroethylene, stainless steel or high purity nickel.

5.3 Platinum dish, capacity 40 ml.

5.4 Fluted glass funnel, diameter 75 mm.

5.5 Glass beaker, capacity 600 ml or 800 ml.

5.6 Muffle furnace.

5.7 Desiccator.

6 SAMPLE

Use powder which will pass through a sieve with a mesh size of 160 µm, prepared in accordance with ISO 3713.

7 PROCEDURE

7.1 Test portion

For silicon contents less than or equal to 50 % (*m/m*), take a test portion of 0,50 ± 0,000 2 g.

NOTE — For silicon contents less than 25 % (*m/m*), it is possible to use a test portion of 1 g.

1) At present at the stage of draft.

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