

INTERNATIONAL STANDARD

ISO
9681

First edition
1990-11-01

Manganese ores and concentrates — Determination of iron content — Flame atomic absorption spectrometric method

*Minerais et concentrés de manganèse — Dosage du fer — Méthode par
spectrométrie d'absorption atomique dans la flamme*



Reference number
ISO 9681:1990(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9681 was prepared by Technical Committee ISO/TC 65, *Manganese and chromium ores*.

© ISO 1990

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Manganese ores and concentrates — Determination of iron content — Flame atomic absorption spectrometric method

1 Scope

This International Standard specifies a flame atomic absorption spectrometric method for the determination of iron content in manganese ores and concentrates. The method is applicable to products having an iron content from 0,2 % (m/m) to 10 % (m/m).

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

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 310:1981, *Manganese ores — Determination of hygroscopic moisture content in analytical samples — Gravimetric method.*

ISO 4296-1:1984, *Manganese ores — Sampling — Part 1: Increment sampling.*

ISO 4296-2:1983, *Manganese ores — Sampling — Part 2: Preparation of samples.*

ISO 4297:1978, *Manganese ores and concentrates — Methods of chemical analysis — General instructions.*

3 Principle

Method 1: Decomposition of the test portion by treatment with hydrochloric, perchloric and hydrofluoric acids. Separation of the insoluble resi-

due, fusion of the residue with a fusion mixture and dissolution of the cooled melt in the test solution. Aspiration of the test solution into an air-acetylene flame in an atomic absorption spectrometer and measurement of the absorbance at a wavelength of 248,3 nm or 344,06 nm.

Method 2: Decomposition of the test portion by treatment with hydrochloric, nitric and perchloric acids and filtration of the insoluble residue. Removal of silica by volatilization with sulfuric and hydrofluoric acids, fusion of the residue with a fusion mixture and dissolution of the cooled melt in the test solution. Aspiration of the test solution into an air-acetylene flame in an atomic absorption spectrometer and measurement of the absorbance at a wavelength of 248,3 nm or 344,06 nm.

4 Reagents

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

4.1 **Metallic manganese**, 99,9 % purity.

4.2 **Hydrochloric acid**, ρ 1,19 g/ml.

4.3 **Hydrochloric acid**, ρ 1,19 g/ml, diluted 1 + 50.

4.4 **Hydrofluoric acid**, ρ 1,14 g/ml.

4.5 **Perchloric acid**, ρ 1,61 g/ml.

4.6 **Nitric acid**, ρ 1,40 g/ml.

4.7 **Nitric acid**, ρ 1,40 g/ml, diluted 1 + 1.

4.8 **Sulfuric acid**, ρ 1,84 g/ml, diluted 1 + 1.

Slowly and with great care, pour 1 volume of concentrated sulfuric acid into an equal volume of water.