
**Iron ores — Determination of total
iron content — EDTA photometric
titration method**

*Minerais de fer — Dosage du fer total — Méthode titrimétrique
photométrique à l'EDTA*



This document is a preview generated by EMS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Reagents	2
6 Apparatus	5
7 Sampling and samples	5
7.1 Laboratory sample	5
7.2 Preparation of test samples	6
7.2.1 General	6
7.2.2 Ores having significant contents of combined water or oxidizable compounds	6
7.2.3 Ores outside the scope of 7.2.2	6
8 Procedures	6
8.1 Number of determinations	6
8.2 Test portion	6
8.3 Blank test	6
8.4 Determination	7
8.4.1 Decomposition of the test portion	7
8.4.2 Titration	7
8.5 Procedure of blank test	7
9 Expression of results	8
9.1 Calculation of total iron content	8
9.2 General treatment of results	8
9.2.1 Repeatability and permissible tolerance	8
9.2.2 Methods for checking the acceptability of the test results and determining the final quoted result	9
9.2.3 Between-laboratories precision	9
9.2.4 Check for trueness	9
9.2.5 Calculation of final result	10
9.3 Oxide factors	10
10 Test report	11
Annex A (informative) Flowsheet of the procedure for the acceptance of analytical values for test samples	12
Annex B (informative) Typical titration curves	13
Annex C (informative) Titration parameters for reference	15
Bibliography	26

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 102, *Iron ore and direct reduced iron*, Subcommittee SC 2, *Chemical analysis*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Iron ores — Determination of total iron content — EDTA photometric titration method

WARNING — This document could involve hazardous materials, operations and equipment. It does not address all of the potential safety concerns associated with its use. It is the responsibility of the user of this method to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This document specifies a photometric titration method using EDTA for the determination of the total iron content of iron ores.

This method is applicable to a concentration range of a mass fraction of 37,00 % to 72,00 % of total iron in natural iron ores, iron ore concentrates and agglomerates, including sinter products.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 385, *Laboratory glassware — Burettes*

ISO 648, *Laboratory glassware — Single-volume pipettes*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

ISO 2596, *Iron ores — Determination of hygroscopic moisture in analytical samples — Gravimetric, Karl Fischer and mass-loss methods*

ISO 3082, *Iron ores — Sampling and sample preparation procedures*

ISO 7764, *Iron ores — Preparation of predried test samples for chemical analysis*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Principle

The samples are digested in closed vessels in a microwave oven in a mixture of nitric acid, hydrochloric acid and hydrofluoric acid. The resulting solution is diluted with water and adjusted to pH 1 with sodium hydroxide. Sulphuric acid is added to the solution to eliminate titanium hydroxide precipitation. Boric acid is added to the solution to reduce the interference of fluoride. Iron is determined by automatic photometric titration with EDTA.