

BS ISO 11938:2012



BSI Standards Publication

Microbeam analysis — Electron probe microanalysis — Methods for elemental-mapping analysis using wavelength-dispersive spectroscopy

bsi.

...making excellence a habit.
AVA Documents™
Document Sharing Hub

National foreword

This British Standard is the UK implementation of ISO 11938:2012

The UK participation in its preparation was entrusted to Technical Committee CII/9, Microbeam analysis.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013. Published by BSI Standards Limited 2013

ISBN 978 0 580 63714 8

ICS 71.040.50

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2013.

Amendments issued since publication

Date	Text affected
------	---------------

**Microbeam analysis — Electron probe
microanalysis — Methods for elemental-
mapping analysis using wavelength-
dispersive spectroscopy**

*Analyse par microfaisceaux — Analyse par microsonde électronique
(microsonde de Castaing) — Méthodes d'analyse par cartographie
élémentaire en utilisant la spectrométrie à dispersion de longueur d'onde*





COPYRIGHT PROTECTED DOCUMENT

© ISO 2012

All rights reserved. Unless otherwise specified, 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 either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Procedure of mapping analysis	2
4.1 General	2
4.2 Specimen preparation	2
4.3 Measurement procedure	3
5 Methods for displaying element maps	6
5.1 General	6
5.2 Raw X-ray intensity method	6
5.3 k-value method	6
5.4 Calibration curve method	6
5.5 Correlation method	7
5.6 Matrix correction method	7
6 Evaluation of uncertainty	7
7 Report	7
Annex A (normative) Comparison of absorption effects for a light element	9
Bibliography	10

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 11938 was prepared by Technical Committee ISO/TC 202, *Microbeam analysis*, Subcommittee SC 2, *Electron probe microanalysis*.

Introduction

Electron probe microanalysis (EPMA) has been developed over the last 50 years^{[1][2][3][4]} and has many areas of application in science and industry. Both qualitative and accurate quantitative analyses are employed extensively in mineralogy and in metallurgical studies, for example. In recent years, with the advances in computers, digital processing techniques have been developed and, instead of X-ray dot images being used to qualitatively observe element distributions, colour mapping techniques^[5] are now often employed. These enable products to be compared and evaluated for the purpose of quality control. Particle analysis and/or phase analysis using mapping requires careful selection of the experimental parameters, and it is essential that a standard be available for this purpose in order to achieve consistent and reliable results.