INTERNATIONAL STANDARD

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Surface chemical analysis — Secondary-ion mass spectrometry — Determination of relative sensitivity factors from ion-implanted reference materials

Analyse chimique des surfaces — Spectrométrie de masse des ions secondaires — Détermination des facteurs de sensibilité relative à l'aide de matériaux de référence à ions implantés

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Foreword

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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 18114 was prepared by Technical Committee ISO/TC 201, *Surface chemical analysis*, Subcommittee SC 6, *Secondary ion mass spectrometry*.

Introduction

Ion-implanted materials are commonly used in secondary-ion mass spectrometry for the calibration of instruments. This international Standard was prepared to provide a uniform method for determining the relative sensitivity factor of an element in a specified matrix from an ion-implanted reference material, and to show how the concentration of the element in a different sample of the same matrix material can be determined.

Surface chemical analysis — Secondary-ion mass spectrometry — Determination of relative sensitivity factors from ion-implanted reference materials

1 Scope

This International Standard specifies a method of determining relative sensitivity factors (RSFs) for secondary-ion mass spectrometry (SIMS) from ion-implanted reference materials.

The method is applicable to specimens in which the matrix is of uniform chemical composition, and in which the peak concentration of the implanted species does not exceed one atomic percent.

2 Normative references

The following referenced documents are indispensable for the application 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 18115, *Surface chemical analysis — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 18115 apply.

4 Symbols and abbreviated terms

$C_i^{A,M}$	the atomic concentration of the analyte element A in the matrix M at cycle i of a depth profile, expressed in atoms per unit volume
d	the depth over which the depth profile is integrated, expressed in length units
$I_i^{A_j}$	the detected count rates of the analyte ion of isotope A_j at measurement cycle i, expressed in counts/s
$I_i^{M_k}$	the detected count rates of the reference isotope M_k at measurement cycle i, expressed in counts/s
I_{BG}	the mean background count rate of species A_j, expressed in counts/s
N^{A_j}	the fractional isotopic abundance of the analyte isotope A_j in the unknown sample
n	the number of cycles over which the depth profile is integrated
Φ	the implanted fluence of isotope A_j, expressed in atoms per unit area
RSF	the relative sensitivity factor, expressed in atoms per unit volume
SIMS	secondary-ion mass spectrometry