INTERNATIONAL STANDARD

ISO 18114

First edition 2003-04-01

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



Reference number ISO 18114:2003(E)

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Foreword

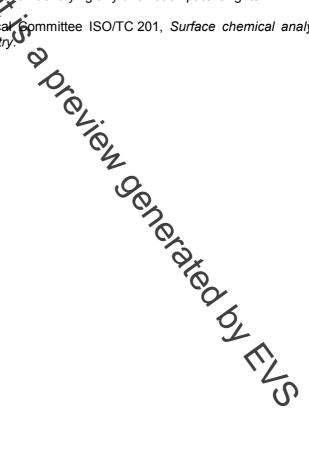
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ISO 18114 was prepared by Technical committee ISO/TC 201, Surface chemical analysis, Subcommittee SC 6, Secondary ion mass spectrometry.



Introduction

lon-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.

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

Scope

1

This International Standard specifies a method of determining relative sensitivity factors (RSFs) for secondaryion mass spectrometry (SMS) 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 impanted species does not exceed one atomic percent.

2 Normative references

The following referenced documents are ndispensable 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 definition oven 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_i , 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_i , expressed in atoms per unit area
- RSF the relative sensitivity factor, expressed in atoms per unit volume
- SIMS secondary-ion mass spectrometry