
**Surface chemical analysis — Auger
electron spectroscopy and X-ray
photoelectron spectroscopy —
Methods used to determine peak
intensities and information required
when reporting results**

*Analyse chimique des surfaces — Spectroscopie des électrons Auger
et spectroscopie de photoélectrons par rayons X — Méthodes utilisées
pour la détermination de l'intensité des pics et informations requises
pour l'expression des résultats*



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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and abbreviated terms	1
5 Methods for peak-intensity determination — direct spectrum	2
5.1 General	2
5.2 Selection and subtraction of an inelastic background	3
5.3 Measurement of peak intensity	4
5.3.1 Measurement of peak height	4
5.3.2 Measurement of peak area	4
5.4 Measurement of a peak intensity with computer software	5
5.5 Measurement of peak intensities for a spectrum with overlapping peaks	5
5.6 Uncertainty in measurement of peak area	6
6 Methods for peak intensity determination — Auger-electron differential spectrum	7
6.1 General	7
6.2 Measurement of Auger-electron differential intensity	7
6.3 Uncertainties in measurement of Auger-electron differential intensity	8
7 Reporting of methods used to measure peak intensities	10
7.1 General requirements	10
7.2 Methods used to determine peak intensities in direct spectra	10
7.2.1 Intensity measurement for a single peak, as described in 5.2 and 5.3	10
7.2.2 Intensity measurements from peak fitting, as described in 5.4 and 5.5	11
7.3 Methods used to obtain and determine peak intensities in Auger-electron differential spectra	11
7.3.1 Method used to obtain differential spectra	11
7.3.2 Method used to determine peak intensities, as described in 6.2	11
Annex A (informative) Instrumental effects on measured intensities	12
Annex B (informative) Useful integration limits for determination of peak intensities in XPS spectra	13
Bibliography	15

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.

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This document was prepared by Technical Committee ISO/TC 201, *Surface chemical analysis*, Subcommittee SC 7, *Electron spectroscopies*.

This third edition cancels and replaces the second edition (ISO 20903:2011), which has been technically revised. The main changes compared to the previous edition are as follows:

- subclause 6.3 has been replaced to include modern methods for dealing with co-existing chemical states;
- minor editorial changes have been introduced for clarity.

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.

Introduction

An important feature of Auger electron spectroscopy (AES) and X-ray photoelectron spectroscopy (XPS) is the ability to obtain a quantitative analysis of the surface region (≈ 1 nm to 10 nm) of a solid sample. Such an analysis requires the determination of the intensities of spectral components.

There are several methods of peak-intensity measurement that are applicable to AES and XPS. In practice, the choice of method will depend upon the type of sample being analysed, the capabilities of the instrumentation used, and the methods of data acquisition and treatment available.

Surface chemical analysis — Auger electron spectroscopy and X-ray photoelectron spectroscopy — Methods used to determine peak intensities and information required when reporting results

1 Scope

This document specifies the necessary information required in a report of analytical results based on measurements of the intensities of peaks in Auger electron and X-ray photoelectron spectra. Information on methods for the measurement of peak intensities and on uncertainties of derived peak areas is also provided.

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 18115-1, *Surface chemical analysis — Vocabulary — Part 1: General terms and terms used in spectroscopy*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 18115-1 apply.

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 Symbols and abbreviated terms

A	peak area
AES	Auger electron spectroscopy
b	number of channels over which intensities are averaged to obtain a baseline
eV	electron volts
n	number of channels in a spectrum
XPS	X-ray photoelectron spectroscopy
y_i	number of counts in the i th channel of a spectrum
ΔE	channel width (in electron volts)
Δt	dwell time per channel (in seconds)
$\sigma(A)$	standard deviation of calculated peak area