
**Microbeam analysis — Electron probe
microanalysis (EPMA) — Vocabulary**

*Analyse par microfaisceaux — Analyse par microsonde électronique
(microsonde de Castaing) — Vocabulaire*



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Published in Switzerland

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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 23833 was prepared by Technical Committee ISO/TC 202, *Microbeam analysis*, Subcommittee SC 1, *Terminology*.

The European Microbeam Analysis Society (EMAS) made contributions to the preparation of the document.

This second edition of ISO 23833 cancels and replaces the first edition (ISO 23833:2006), of which it constitutes a minor revision.

This International Standard has a cross-reference relationship with the surface chemical analysis vocabulary prepared by ISO/TC 201 (ISO 18115-1:2010).

Introduction

Electron probe X-ray microanalysis (EPMA) is a modern technique used to qualitatively determine and quantitatively measure the elemental composition of solid materials, including metal alloys, ceramics, glasses, minerals, polymers, powders, etc., on a spatial scale of approximately one micrometer laterally and in depth. EPMA is based on the physical mechanism of electron-stimulated X-ray emission and X-ray spectrometry.

As a major sub-field of microbeam analysis (MBA), the EPMA technique is widely applied in diverse business sectors (high-tech industries, basic industries, metallurgy and geology, biology and medicine, environmental protection, trade, etc.) and has a wide business environment for standardization.

Standardization of terminology in a technical field is one of the basic prerequisites for development of standards on other aspects of that field.

This International Standard is relevant to the need for an EPMA vocabulary that contains consistent definitions of terms as they are used in the practice of electron probe microanalysis by the international scientific and engineering communities that employ the technique.

Microbeam analysis — Electron probe microanalysis (EPMA) — Vocabulary

1 Scope

This International Standard defines terms used in the practices of electron probe microanalysis (EPMA). It covers both general and specific concepts classified according to their hierarchy in a systematic order.

This International Standard is applicable to all standardization documents relevant to the practices of EPMA. In addition, some parts of this International Standard are applicable to those documents relevant to the practices of related fields (SEM, AEM, EDX, etc.) for definition of those terms common to them.

2 Abbreviated terms

BSE	backscattered electron
CRM	certified reference material
EDS	energy-dispersive spectrometer
EDX	energy-dispersive X-ray spectrometry
EPMA	electron probe microanalysis or electron probe microanalyser
eV	electronvolt
keV	kiloelectronvolt
RM	reference material
SE	secondary electron
SEM	scanning electron microscope
WDS	wavelength-dispersive spectrometer
WDX	wavelength-dispersive X-ray spectrometry

3 Definitions of general terms used in electron probe microanalysis

3.1

electron probe microanalysis

EPMA

technique of spatially-resolved elemental analysis based upon electron-excited X-ray spectrometry with a focussed electron probe and an electron interaction volume with micrometer to sub-micrometer dimensions

3.1.1

qualitative EPMA

procedure in EPMA leading to the identification of the elements present in the electron-excited interaction volume by a systematic method for the recognition and assignment of X-ray spectral peaks to specific elements