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# NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA



# GB/T 21636-2021

## Microbeam analysis - Electron probe microanalysis (EPMA) - Vocabulary

**Issued on: December 31, 2021** **Implemented on: July 1, 2022**

**Issued by: State Administration for Market Regulation, China National Standardization Administration**

# Table of Contents





## foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules of Standardization Documents"

Drafting:

This document replaces GB/T 21636-2008 "Microbeam Analysis Electron Probe Microanalysis (EPMA) Terminology", and GB/T 21636-

Compared with:2008, Chapter 2 normative reference documents have been added: Except for structural adjustment and editorial changes, the main technical changes are as follows:

a) Added some terms and definitions (see 4:5:5 and 5:6:4:5:3);

b) Changed the terms and definitions of backscattered electron image, secondary electron image, absorption current image and characteristic X-ray (see 4:4:1, 5:4:2,

5:4:11, 5:4:12, 3:4:1, 4:4:2, 4:4:11, 4:4:12 of the:2008 edition);

c) Changed some terms (see 5:4:7, 5:4:8, 5:5:1, 5:6:8, 5:6:14:2, 6:6:8, 4:4:7, 4:4:8, 4:5:1,

4:6:8, 4:6:14:2, 5:6:8)

d) Added annotations and contents of some terms (see 4:5:5, 5:1:2, 5:2:2, 5:4:7, 5:6:2):

This document is equivalent to ISO 23833:2013 "Microbeam Analysis Electron Probe Microanalysis (EPMA) Terminology":

This document adds a chapter "Normative References":

Please note that some content of this document may be patented: The issuing agency of this document assumes no responsibility for identifying patents:

## Introduction

Electron Probe Microanalysis (EPMA) is a modern technique that is widely used in the field of Microbeam Analysis (MBA): Electron Probe

Microscopic analysis enables elemental analysis on the micron scale of solid materials (including metals, alloys, ceramics, glasses, minerals, polymers, powders, etc:)

Qualitative, quantitative analysis and microstructural analysis have been widely used in material science, high-tech industry, basic industry, agriculture, metallurgy, geology, biotechnology, etc:

materials, medicine and health, environmental protection, commodity inspection and trade, and even criminal courts: The terminology standard for each technical field is the standardization development in the field

One of the prerequisites of this document is the terminology related to electron probe microscopic analysis:

Electron probe microanalysis is a comprehensive technique, and its terms involve a wide range of disciplines such as physics, chemistry, and electronics: this document

Limited to the definition of terms used and directly related to the standardization practice of Electron Probe Microanalysis (EPMA), including:

--- Electron probe microanalysis defined in general terms;

--- Definitions of terms describing Electron Probe Microanalysis Instruments;

--- Definition of terms used in electron probe microanalysis methods:

Microbeam Analysis

Electron Probe Microanalysis (EPMA) Terminology

## 1 Scope

This document defines the terminology used in the practice of Electron Probe Microanalysis (EPMA), including terms of general concepts and

A term for a specific concept of a method classification:

This document applies to definitions of common terms in all standard and practice documents in the relevant field (SEM, AEM, EDX, etc:):

## 2 Normative references

There are no normative references in this document:

## 3 Abbreviations

The following abbreviations apply to this document:

BSE: backscattered electrons

CRM: certified reference material, standard sample (certified reference material)

EDS: energy-dispersivespectrometer

EDX: energy-dispersiveX-rayspectrometry

EPMA: Electron Probe Microanalysis

Electron probe microanalyzer (electronprobemicroanalyzer)

eV: electron volt (electronvolt)

keV: kiloelectronvolt (kiloelectronvolt)

SE: secondary electron (secondary electron)

SEM: scanning electron microscope (scanning electron microscope)

WDS: Wavelength-dispersivespectrometer

WDX: Wavelength-dispersiveX-rayspectrometry



## 4 Definition of general terms used in electron probe microanalysis

4:1

electron probe microanalysis; EPMA

According to the spectroscopic principle of X-ray excitation by the interaction between the focused electron beam and the volume of the sample at the micron to submicron scale, the electron exciter

A technique for analyzing elements within a product:

4:1:1

Qualitative Electron Probe Microanalysis qualitativeEPMA

Electron probe microanalysis is an electron probe microanalysis method to identify the elemental composition in the electronically excited volume of a sample by identifying the peaks of the X-ray spectrum: