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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 23414-2026

Replacing GB/T 23414-2009

**Microbeam analysis - Scanning electron microscopy -
Vocabulary**

微束分析 扫描电子显微术 术语

(English Translation)

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Foreword

This document is in accordance with GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting is scheduled.

This document supersedes GB/T 23414-2009 "Microbeam Analysis - Scanning Electron Microscopy Terminology" and is consistent with GB/T 23414-2009.

Compared to previous versions, aside from structural adjustments and editorial changes, the main technical changes are as follows.

- a) The definition of the abbreviation "EDS" has been changed (see Chapter 3, Chapter 2 of the 2009 edition);
- b) The definition of the term "field emission" has been changed (see 4.1.2.1, 3.1.2.1 in the 2009 edition);
- c) The definition of the term "Monte Carlo simulation" has been changed (see 4.5.5, 3.5.5 in the 2009 edition);
- d) The definition of the term "electron backscatter diffraction (EBSD)" has been changed (see 4.7.1, 3.7.1 of the 2009 edition);

e) The definition of the term "astigmatism" has been changed (see 5.2.3, 4.2.3 of the 2009 edition);

f) The definition of the term "condenser lens" has been changed (see 5.2.4, 4.2.4 in the 2009 edition);

g) The separate term entries for "Variable Pressure Scanning Electron Microscopy (VPSEM)" and "Environmental Scanning Electron Microscopy (ESEM)" have been deleted (see 2009).

The relevant concepts from versions 4.4.3 and 4.4.4 have been integrated into "Controllable Pressure SEM" (see 5.4.5);

h) The definition of "gas secondary electron detector" and "environmental SE detector" has been changed after merging the terms (see 5.6.2.6, 2009 edition).

4.6.2.8 and 4.6.2.6);

i) The definition of the term "pixel" has been changed (see 6.2.4, 5.2.4 in the 2009 version);

j) The terminology and definition for "pixel size" have been added (see 6.2.5);

k) The term and definition of "surface tilt contrast" have been added (see 6.3.9.1);

l) The term and definition of "edge effect" have been added (see 6.3.11);

m) The definition of the term "quenching" has been changed (see 7.6.10, 6.6.10 in the 2009 edition);

n) The definition of the term "edge widening" has been changed (see 8.3.2, 7.3.2 of the 2009 edition);

o) The terminology and definition of "binarized SEM image" have been added (see 8.4).

This document adopts ISO 22493:2014 "Microbeam analysis - Scanning electron microscopy - Terminology".

This document adds a chapter on "Normative References".

The following minimal editorial changes have been made to this document.

---The abbreviation "EDX" has been added (see Chapter 3);

---Added a note to 8.1 (see 8.1);

---Added a note to 8.3 (see 8.3);

--- An index has been added.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed and is under the jurisdiction of the National Technical

Committee on Standardization of Microbeam Analysis (SAC/TC38).

Introduction

Scanning electron microscopy (SEM) is used to observe and characterize solid materials such as metals, alloys, ceramics, glass, minerals, polymers, and powders.

The morphology and structure of the material in the micrometer-nanometer range were analyzed. Furthermore, the three-dimensional structure could be reconstructed using focused ion beam and scanning electron microscopy techniques.

SEM technology is based on the physical mechanisms of electron optics, electron scattering, and secondary electron emission.

SEM technology is a major branch of microbeam analysis (MBA) and has been widely used in high-tech industries, basic industries, metallurgy, and geology.

Fields such as biology and medicine, environmental protection, and commerce. Standardization of terminology in each technical field is one of the prerequisites for the development of standardization in that field.

Microbeam analysis scanning electron microscopy terminology

1 Scope

This document defines the terminology used in practical applications of scanning electron microscopy (SEM). This includes fundamental terminology and terminology categorized by different techniques.

The terminology for classification includes terms already defined in ISO 23833.

This document applies to all standardized documents related to practical applications of SEM. Additionally, some terminology in this document also applies to related...

Documents in the field [e.g., electron probe microscopy (EPMA), analytical electron microscopy (AEM), energy dispersive spectroscopy (EDX), etc.].

2 Normative references

This document has no normative references.

3 Abbreviations

CRT. Cathode ray tube EDX. Energy-dispersive X-ray spectrometry croscope) SE. Secondary electron croscope/microscopy)

4 SEM Physical Basic Terminology and Definitions

Electron optics

The science of electrons moving through electrostatic and/or electromagnetic fields.

4.1.1

electronsources

In an electron optics system, an electron emitting device is required to form an electron beam.