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

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**Microbeam analysis - Electron probe microanalyser(EPMA) -
Guidelines for performing quality assurance procedures**

微束分析 电子探针显微分析仪（EPMA）质量保证程序实施导则

(English Translation)

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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 for standardization documents" Drafting:

This document is equivalent to ISO 19463:2018 "Guidelines for the implementation of quality assurance procedures for electron probe microanalyzers (EPMA) for microbeam analysis" but":

The following minimal editorial changes were made to this document:

--- Added the note for the term "detection limit" (see 3.15);

--- Added description of count rate units (see note to 4.3.3.7.2):

Introduction

The primary goal of an analytical laboratory's quality assurance (QA) program is ultimately the reliability of test results:

The selection of verification standards is aimed at comprehensively evaluating the instrument performance: For electron probe, comprehensive instrument performance evaluation mainly includes the stability of the electron gun:

The spectrometer is equipped with various diffraction crystals, spectrometer drive mechanisms, crystal Mechanical components such as body switching may fail or degrade individually or simultaneously, and may not necessarily be noticed in daily measurements:

This document provides a general method for performing a comprehensive and reliable electron probe microanalyzer (EPMA) in a short time:

Performing this process regularly can track the quality of the instrument's basic qualitative and quantitative analysis, confirm that the instrument is operating normally, and detect instrument problems:

This document also provides information on deviations in analytical results caused by defects in the sample and sample preparation:

Evaluation Method: Apply the QA diagnostic process of this document equally to multiple instruments in a single laboratory or even to multiple instruments in different laboratories:

This helps to improve the comparability of analytical results obtained by different instruments:

The selection of validation standards and reference materials is critical to the implementation of the quality assurance process: The list in Appendix A is for reference only:

Standard samples and reference materials under the conditions described in this document may also be used:

Microbeam Analysis Electron Probe Microanalyzer (EPMA) Guidelines for the implementation of quality assurance procedures

1 Scope

This document provides guidance for routine diagnostics and quality assurance procedures for Electron Probe Microanalyzers (EPMA):

This procedure is used regularly by authors to confirm instrument health or to troubleshoot problems: It covers the characteristics of the required reference materials and the independent analytical procedures required to measure and fully evaluate the performance of the major components of an EPMA system:

The analytical procedures described in this document are intended to validate the instrument for exploratory analysis of unknown samples, trace analysis, and non-routine work (e.g., peak drying):

The ability to detect interference) is different from single-element rapid diagnostic procedures that are only used for checking the position of diffraction crystals and test conditions:

This document applies to electron probe and other wavelength spectrometer (WDS) systems that use characteristic X-ray spectral lines detected by WDS to the element identification and quantitative analysis can be realized by wavelength and intensity analysis: This document does not apply to element analysis performed by energy dispersive spectrometer (EDS):

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document:

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document:

2:Applied statistics) Note: GB/T 3358.2-2009 Statistical vocabulary and symbols Part 2: Applied statistics (ISO 3534-2:2006, IDT) ISO 14595 Microbeam analysis - Electron probe microanalysis - Guidelines for the technical conditions of standard samples Note: GB/T 4930-2021 Microbeam analysis - Guidelines for the technical conditions of standard samples for electron probe microanalysis (ISO 14595:2014, IDT) ISO 22489 Microbeam analysis Electron probe microanalysis Bulk sample Spectroscopy quantitative point analysis (Microbeam analysis-persive X-ray spectroscopy) Note: GB/T 28634-2012 Microbeam analysis Electron probe microanalysis Bulk specimens Spectroscopy quantitative point analysis (ISO 22489:2006, IDT) ISO 23833 Microbeam analysis - Electron probe microanalysis (EPMA) - Terminology Note: GB/T 21636-2021 Microbeam analysis Electron probe microanalysis (EPMA) Terminology (ISO 23833:2013, IDT)

3 Terms and definitions

For the purpose of this document, the terms and definitions defined in ISO 23833, ISO/IEC Guide 99, ISO 3534-2 and the following apply:

An instrument for electron-induced X-ray microscopy: