

ICS 71.040.40

CCS G 04



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

GB/T 25187-2024

Replacing GB/T 25187-2010

**Surface chemical analysis - Auger electron spectroscopy -
Description of selected instrumental performance parameters**

表面化学分析 俄歇电子能谱 选择仪器性能参数的表述

(English Translation)

Issued on: November 28, 2024

Implemented on: June 1, 2025

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

Table of Contents

Preface
Introduction
1 Scope
2 Normative references
3 Terms and Definitions
4 Symbols and abbreviations
5 Select the expression of instrument performance parameters
5.1 Analysis methods
5.2 Samples
5.3 System Configuration
5.4 Electron Gun Cathode
5.5 Lateral resolution and beam current
5.6 Spectrometer signal intensity and energy resolution
5.7 Spectrometer Energy Scale
5.8 Spectrometer Intensity Linearity
5.9 Spectrometer response function
5.10 Spectrometer Parameters
5.11 Image Drift
5.12 Vacuum Environment
References

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 is required.

This document replaces GB/T 25187-2010 "Presentation of instrument performance parameters for surface chemical analysis Auger electron spectroscopy" and is consistent with Compared with GB/T 25187-2010, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

-Modified noise measurement method 2 (see 5.6.3, 5.6.3 of the 2010 edition).

This document is equivalent to ISO 15471:2016 "Expression of selected instrument

performance parameters for surface chemical analysis - Auger electron spectroscopy".

Introduction

There are several manufacturers of Auger Electron Spectrometers (AES) and Scanning Auger Electron Microscopes (SAM) around the world.

The basic principles of AES analysis methods are the same, but the specific design of the instruments and the way the performance is described vary. Therefore, it is often difficult to compare this document provides a basic checklist so that all Auger electron spectrometers can be used in a common way.

This document is not intended to replace the manufacturer's instructions, which may be 30 pages or more.

Certain items identified in the book have consistent and clear meanings.

Surface chemical analysis Auger electron spectroscopy Select the statement of instrument performance parameters

1 Scope

This document specifies the requirements for the presentation of specific performance parameters of Auger electron spectrometers.

This document applies to the performance parameter description of Auger electron spectrometers.

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.

in this document.

ISO 18115-1 Surface chemical analysis Vocabulary Part 1: General terms and spectroscopic terms is-Vocabulary-Part 1: General terms and terms used in spectroscopy)
Note. GB/T 22461.1-2023 Vocabulary for surface chemical analysis Part 1: General terms and spectral terms (ISO 18115-1:2013, IDT)

3 Terms and definitions

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

4 Symbols and abbreviations

The following symbols and abbreviations apply to this document.

AES. Auger electron spectroscopy Auger electron spectrometer FL:Fermi level FWHM. full width at half maximum rms. root mean square SAM. scanning auger electron microscope Scanning Auger electron microscopy SEM. scanning electron microscope VL. vacuum level Note. For a long time, the kinetic energy scale of AES instruments has been referenced to VL, while XPS or AES/XPS combined spectrometers have been referenced to FL.

This is done by subtracting the spectrometer work function from the electron kinetic energy; an approximation is to subtract 4.5 eV from the kinetic energy of the FL reference, which is sufficient for most experiments.

International AES and SAM applications are feasible.

5.1 Analysis methods

The methods used to obtain information from the samples should be briefly described, and alternative analytical techniques should be described for the system under consideration.