

Volume 10  
**Materials Characterization**

**1. Introduction**

Introduction to Materials Characterization  
How to Use the Handbook  
Sampling

**2. Optical and X-Ray Spectroscopy**

Optical Emission Spectroscopy  
Inductively Coupled Plasma Atomic Emission Spectroscopy  
Atomic Absorption Spectrometry  
Ultraviolet/Visible Absorption Spectroscopy  
Molecular Fluorescence Spectroscopy  
X-Ray Spectrometry  
Particle-Induced X-Ray Emission  
Infrared Spectroscopy  
Raman Spectroscopy

**3. Mass Spectroscopy**

Spark Source Mass Spectrometry  
Gas Analysis by Mass Spectrometry

**4. Classical, Electrochemical, and Radiochemical Analysis**

Classical Wet Analytical Chemistry  
Potentiometric Membrane Electrodes  
Voltammetry  
Electrogravimetry  
Electrometric Titration  
Controlled-Potential Coulometry  
Elemental and Functional Group Analysis  
High-Temperature Combustion  
Inert Gas Fusion  
Neutron Activation Analysis  
Radioanalysis

## **5. Resonance Methods**

- Electron Spin Resonance
- Ferromagnetic Resonance
- Nuclear Magnetic Resonance
- Moss Bauer Spectroscopy

## **6. Metallographic Techniques**

- Optical Metallography
- Image Analysis

## **7. Diffraction Methods**

- Introduction to Diffraction Methods
- X-Ray Powder Diffraction
- Single-Crystal X-Ray Diffraction
- Crystallographic Texture Measurement and Analysis
- X-Ray Topography
- X-Ray Diffraction Residual Stress Techniques
- Radial Distribution Function Analysis
- Small-Angle X-Ray and Neutron Scattering
- Extended X-Ray Absorption Fine Structure
- Neutron Diffraction

## **8. Electron Optical Methods**

- Analytical Transmission Electron Microscopy
- Scanning Electron Microscopy
- Electron Probe X-Ray Microanalysis
- Low-Energy Electron Diffraction

## **9. Electron or X-Ray Spectroscopic Methods**

- Auger Electron Spectroscopy
- X-Ray Photoelectron Spectroscopy

## **10. Methods Based on Sputtering or Scattering**

### **Phenomena**

- Field Ion Microscopy and Atom Probe Microanalysis
- Low-Energy Ion-Scattering Spectroscopy
- Secondary Ion Mass Spectroscopy
- Rutherford Backscattering Spectrometry

## **11. Chromatography**

Gas Chromatography/Mass Spectrometry

Liquid Chromatography

Ion Chromatography