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Nota di contenuto	Total-Reflection X-ray Fluorescence Analysis and Related Methods; Contents; Foreword; Acknowledgments; List of Acronyms; List of Physical Units and Subunits; List of Symbols; Chapter 1: Fundamentals of X-Ray Fluorescence; 1.1 A Short History of XRF; 1.2 The New Variant TXRF; 1.2.1 Retrospect on its Development; 1.2.2 Relationship of XRF and TXRF; 1.3 Nature and Production of X-Rays; 1.3.1 The Nature of X-Rays; 1.3.2 X-Ray Tubes as X-Ray Sources; 1.3.2.1 The Line Spectrum; 1.3.2.2 The Continuous Spectrum; 1.3.3 Polarization of X-Rays; 1.3.4 Synchrotron Radiation as X-Ray Source 1.3.4.1 Electrons in Fields of Bending Magnets 1.3.4.2 Radiation Power of a Single Electron; 1.3.4.3 Angular and Spectral Distribution of SR; 1.3.4.4 Comparison with Black-Body Radiation; 1.4 Attenuation of X-Rays; 1.4.1 Photoelectric Absorption; 1.4.2 X-Ray Scatter; 1.4.3 Total Attenuation; 1.5 Deflection of X-Rays; 1.5.1 Reflection and Refraction; 1.5.2 Diffraction and Bragg's Law; 1.5.3 Total External Reflection; 1.5.3.1 Reflectivity; 1.5.3.2 Penetration Depth; 1.5.4 Refraction and Dispersion; References; Chapter 2: Principles of Total Reflection XRF; 2.1 Interference of X-Rays

2.1.1 Double-Beam Interference 2.1.2 Multiple-Beam Interference; 2.2 X-Ray Standing Wave Fields; 2.2.1 Standing Waves in Front of a Thick Substrate; 2.2.2 Standing Wave Fields Within a Thin Layer; 2.2.3 Standing Waves Within a Multilayer or Crystal; 2.3 Intensity of Fluorescence Signals; 2.3.1 Infinitely Thick and Flat Substrates; 2.3.2 Granular Residues on a Substrate; 2.3.3 Buried Layers in a Substrate; 2.3.4 Reflecting Layers on Substrates; 2.3.5 Periodic Multilayers and Crystals; 2.4 Formalism for Intensity Calculations; 2.4.1 A Thick and Flat Substrate
2.4.2 A Thin Homogeneous Layer on a Substrate 2.4.3 A Stratified Medium of Several Layers; References; Chapter 3: Instrumentation for TXRF and GI-XRF; 3.1 Basic Instrumental Setup; 3.2 High and Low-Power X-Ray Sources; 3.2.1 Fine-Focus X-Ray Tubes; 3.2.2 Rotating Anode Tubes; 3.2.3 Air-Cooled X-Ray Tubes; 3.3 Synchrotron Facilities; 3.3.1 Basic Setup with Bending Magnets; 3.3.2 Undulators, Wigglers, and FELs; 3.3.3 Facilities Worldwide; 3.4 The Beam Adapting Unit; 3.4.1 Low-Pass Filters; 3.4.2 Simple Monochromators; 3.4.3 Double-Crystal Monochromators; 3.5 Sample Positioning
3.5.1 Sample Carriers 3.5.2 Fixed Angle Adjustment for TXRF (''Angle Cut''); 3.5.3 Stepwise-Angle Variation for GI-XRF (''Angle Scan''); 3.6 Energy-Dispersive Detection of X-Rays; 3.6.1 The Semiconductor Detector; 3.6.2 The Silicon Drift Detector; 3.6.3 Position Sensitive Detectors; 3.7 Wavelength-Dispersive Detection of X-Rays; 3.7.1 Dispersing Crystals with Soller Collimators; 3.7.2 Gas-Filled Detectors; 3.7.3 Scintillation Detectors; 3.8 Spectra Registration and Evaluation; 3.8.1 The Registration Unit; 3.8.2 Performance Characteristics; 3.8.2.1 Detector Efficiency; 3.8.2.2 Spectral Resolution
3.8.2.3 Input-Output Yield

Sommario/riassunto

Providing an accessible introduction into the use of Total-Reflection X-ray Fluorescence (TXRF) Analysis, both from a theoretical point of view and for practical applications, this new edition of Total-Reflection X-Ray Fluorescence Analysis is completely updated and enlarged to emphasize new methods and techniques. Written to enable students and scientists to evaluate the suitability of a TXRF method for their specific needs, the text provides an overview to the physical fundamentals and principles of Total-Reflection X-ray Fluorescence (TXRF) Analysis, explains instrumentation and setups, and

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