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Nota di contenuto	X-ray Diffraction by Polycrystalline Materials; Table of Contents; Preface; Acknowledgements; An Historical Introduction: The Discovery of X-rays and the First Studies in X-ray Diffraction; Part 1. Basic Theoretical Elements, Instrumentation and Classical Interpretations of the Results; Chapter 1. Kinematic and Geometric Theories of X-ray Diffraction; 1.1. Scattering by an atom; 1.1.1. Scattering by a free electron; 1.1.1.1. Coherent scattering: the Thomson formula; 1.1.1.2. Incoherent scattering: Compton scattering [COM 23]; 1.1.2. Scattering by a bound electron 1.1.3. Scattering by a multi-electron atom 1.2. Diffraction by an ideal crystal; 1.2.1. A few elements of crystallography; 1.2.1.1. Direct lattice; 1.2.1.2. Reciprocal lattice; 1.2.2. Kinematic theory of diffraction; 1.2.2.1. Diffracted amplitude: structure factor and form factor; 1.2.2.2. Diffracted intensity; 1.2.2.3. Laue conditions [FRI 12]; 1.2.3. Geometric theory of diffraction; 1.2.3.1. Laue conditions; 1.2.3.2. Bragg's law [BRA 13b, BRA 15]; 1.2.3.3. The Ewald sphere; 1.3. Diffraction by an ideally imperfect crystal; 1.4. Diffraction by a polycrystalline sample

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Sommario/riassunto

This book presents a physical approach to the diffraction phenomenon and its applications in materials science. An historical background to the discovery of X-ray diffraction is first outlined. Next, Part 1 gives a description of the physical phenomenon of X-ray diffraction on perfect and imperfect crystals. Part 2 then provides a detailed analysis of the instruments used for the characterization of powdered materials or thin films. The description of the processing of measured signals and their results is also covered, as are recent developments relating to quantitative microstructural ana
