<<X射线晶体学基础>>

图书基本信息

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内容概要

Fundamentals of X-Ray Crystallography is the condensation and crystallization of the author's over 50 years of scientific research and teaching experience. In order to help readers to understand crystallography theory, to establish vivid three dimensional concepts of symmetry operations, simple geometry concepts and methods are employed in the analysis and derivation of the symmetry principles and diffraction theory in this book. This book is divided into three sections: fundamental principle of geometric crystallography, symmetry principle in the microscopic space and fundamental principles of crystal X-ray diffraction.In Section I and Section II, with the application of consistency principle between the distribution of general symmetry equivalent points and the spatial symmetry,the macroscopic and microscopic symmetry and their combinations are intensively analyzed and discussed. The 32 point groups and 230 microscopic symmetry combinations are systematically derived as well. In Section III, based on the relation between crystal lattice and its reciprocal lattice, the mathematical model of reciprocal lattice, Ewald sphere and their relations are adopted in the elucidation of Laue Equation and Bragg Reflection Equation. Several important single crystal diffraction measurement methods, instruments and their applications are also illustrated. In addition, through the principles of systematic absence of reciprocal lattice caused by microscopic translations, the systematic absence principle of diffraction is illustrated. The 120 diffraction groups are derived as well.

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章节摘录

版权页：插图：In discussions on crystal projection in chapter 2, we showed that to study the relationships between the crystal faces of a crystal polyhedron, it is necessary to study only the internal point-to-point relationships between a group of points on the plane of the projection sphere. The symmetry pattern formed by the crystalfaces is represented by the symmetry pattern composed of a group of points, and the symmetry relationships between the crystal faces are expressed by the symmetry relationships between the geometric locations of those points. There fore,each of the symmetry classes in geometric crystallography can be represented by a group of points with specific symmetry relationships in which the group of points fully characterizes the symmetric features of the corresponding symmetry class. Here,the symmetry transformation refers to the relationships between the geometric locations of the points. We are more accustomed to calling the 32symmetry classes the 32 point groups.

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