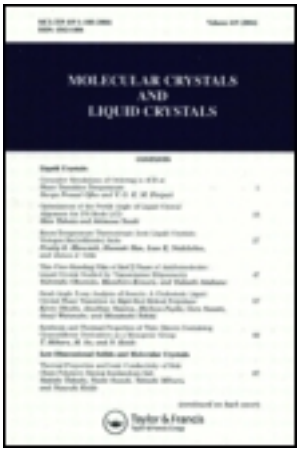

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A Review of: "The Basics of Crystallography and Diffraction, Third Edition, by Christopher Hammond"

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Book Review

The Basics of Crystallography and Diffraction, Third Edition, by Christopher Hammond (University of Leeds). Oxford Science Publications: ISBN: S978-0-19-954645-9 (paperback); 416 pp.; $60.00.

Crystallography plays an important role in a wide range of disciplines, including biology, chemistry, materials science and technology, mineralogy and physics, as well as engineering. Although many students and researchers are required to study crystallography, they have a tendency to suppose that crystallography is an abstruse and difficult subject. The author comes up with various ideas to make the understanding of crystallography easy, Especially, the description of symmetry is beautiful, and I wanted to incorporate the explanation to my class.

This book is organized into 13 chapters. The first chapter gives an introduction to the subject and presents the simplest examples. Chapters 2 and 3 are concerned with two- and three-dimensional lattices, respectively. Crystal symmetry is described in Chapter 4. Crystal and point symmetries are well explained by utilizing a character *R*. The pictures and illustrations are particularly effective.

Chapter 6 is focused on reciprocal lattice, which is the key to understanding diffraction. The author treats it separately from diffraction. I recommend reading this chapter again after chapter 9. Chapter 7 concerns diffraction of light. Explanation of light diffraction before that of X-ray diffraction makes it easier to understand diffraction. Chapter 8 describes the historical development of the geometrical interpretation of X-ray diffraction patterns through the work of Laue, the Braggs, and Ewald. Chapters 9 and 10 cover X-ray diffraction from single crystals and polycrystalline materials, respectively. These subjects are usually treated at different textbooks. I think it is useful for materials scientists who use both single crystal and powder X-ray diffractions. Chapter 11 is focused on electron diffraction, and the final chapter, chapter 13, is an outline of Fourier analysis.

This is a very good introductory textbook for undergraduate students and young researchers who need to study crystallography. It describes the fundamental concepts thoroughly, such as crystal systems, unit cells, space groups, and Bragg's law. Symmetry is explained very carefully with illustrations and pictures. The book treats not only fundamental single crystal X-ray diffraction but also light, electron, and powder X-ray diffraction. It should be helpful for a deep understanding of X-ray crystallography.

I am very pleased with the appendixes. Biographical notes on crystallographers and scientists must interest us very much. I strongly recommend this book to undergraduate and postgraduate students.

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