site. The calculation thus reproduces the partition coefficient *versus* ionic radii diagrams of Onuma.

In summary, the book is an excellent review of the recent advances in the application of modern condensed-matter physics in high-pressure and high-temperature mineralogy and the study of the deep earth interior. However, the book does not cover the whole field where physics meets mineralogy, *e.g.* physical properties of minerals such as magnetism or electrical conductivity, which also are of great geophysical importance, are not discussed very profoundly.

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Applications of neutron scattering to soft condensed matter. Edited by Barbara J. Gabrys. Pp. xii + 362. New York: Gordon and Breach Science Publishers, 2000. Price US $95, £63, EUR 105, ISBN 90-5699-300-3.

Thanks to a combination of several factors: high bulk penetrating power, the ability to manipulate local scattering amplitudes through deuteration, and having both the 'right' wavelength and energy, neutron scattering has played a key role in the exploration of the structure and dynamics of soft condensed matter over the past 25 years. This book gives a comprehensive treatment of the principles governing the application of the technique to study such systems and extends the information contained in currently available textbooks such as *Neutron, X-ray and Light Scattering; Introduction to an Investigative Tool for Colloidal and Polymeric Systems*, edited by. P. Lindner & T. Zemb [Elsevier (1991)], *Polymers and Neutron Scattering*, by J. S. Higgins & H. C. Benoit [Oxford Science Publishers (1994)] and *Methods of X-ray and Neutron Scattering in Polymer Science*, by R.-J. Roe [Oxford University Press (2000)].

The wide range of neutron-scattering applications in soft matter makes it difficult to cover all subjects of current interest in a single volume but in this book the editor offers a very useful selection of topics. An introductory chapter by W. Zajac & B. Gabrys presents the principles underlying neutron scattering and provides the background for the techniques explained in more detail in subsequent chapters. So as to complement, rather than duplicate, material that has been extensively covered elsewhere, less attention is paid to subjects such as neutron production and spectrometers *etc.* However, an updated vantage point on newer instrumentation, such as the ISIS TFXA time-of-flight focused crystal spectrometer, is given in the chapter 'Inelastic Neutron Scattering of Polymers' (S. F. Parker). As mentioned above, the main emphasis is on new material and there are chapters on 'Neutron Scattering in the Pharmaceutical Sciences' (C. Washington, M. J. Lawrence & D. Barlow) and 'The Liquid Structure of Halocarbons' (A. N. Burgess, K. A. Johnson, K. A. Mort & W. Spencer Howells) which, to my knowledge, have not been included in similar textbooks before. The emphasis on materials that are both chemically interesting and industrially important reflects the editor's concern to highlight the impact of neutron scattering on wealth creation. Similarly, the fact that two of the twelve contributors are from industry emphasizes the practical nature of many of the applications discussed.

Small-angle neutron scattering (SANS) has been widely applied to study soft matter for decades, and is perhaps the neutron-scattering technique best known to academic and industrial scientists alike. Reflectometry, the other technique that probes large-scale (1–100 nm) structures, has come to the attention of neutron scientists and users more recently but is already the second most widely used technique in industrial applications. Chapters on the 'Organization and Dynamics of Polymers at Fluid Interfaces' (S. K. Peace & R. W. Richards), 'The Structure of Surfactant Monolayers at the Air–Water Interface Studied by Neutron Reflection' (J. R. Liu & R. K. Thomas) and 'Using SANS to Study Absorbed Layers in Colloidal Dispersions' (S. M. King, P. G. Griffiths & T. Cosgrove) reflect the growing interest over the past decade in applying neutron techniques to study surface morphologies, as opposed to the bulk structures studied by SANS.

A chapter on 'Crystalline and Amorphous Polymers' reviews well documented material on a subject where the main research was performed decades ago. The author (K. Kaji) and this reviewer faced a similar problem; I recently attempted the same task and found it hard to find references to significant work after 1990! However, Kaji's chapter gives an accurate and comprehensive summary of the main findings of research on this subject over the past three decades. Chapters on 'Polymer Blends' (V. Arrighi & J. S. Higgins) and 'Scattering from Dilute Solutions and Solid State Ionomers' (A. M. Young & B. Gabrys) provide a concise but self-sufficient overview of the applications of SANS in investigations of the structure and thermodynamic properties of macromolecules in small-molecule and polymeric solvents, in bulk and at interfaces. A chapter on 'Molecular Structures Determined by Neutron Diffraction' (N. Shankland, A. J. Florence, C. C. Wilson & K. Shankland) presents the state-of-the-art in the structure refinement of crystalline materials using neutron diffraction data from powders and single-crystal samples. Almost all crystal structures are still determined by X-ray diffraction. Before neutron diffraction can take full advantage of the fact that it is much more effective for determining the positions of light atoms such as hydrogen, the technique must await the development of higher flux cameras with wider solid-angle detector banks or improvements in methods of growing crystals of sufficient volume (2–5 mm^3) for present-day instruments.

The general standard of presentation in the various articles is high and there are few typographical errors. Bibliographies for each chapter, together with an overall index at the end of the book, give the reader helpful points of entry into the relevant literature and most references cite article titles. The price of the book may limit its circulation among graduate students, which is a pity, as this is a highly commendable work, which is likely to become well worn with use in my laboratory.

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