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BOOK REVIEWS

Springer Handbook of Enzymes, Supplement, Volume S1: Class 1 Oxidoreductases EC 1, 2nd ed. Edited by Dietmar Schomburg and Ida Schomburg (Technical University Braunschweig, Germany). Co-edited by Antje Chang (Technical University Braunschweig). Springer-Verlag: Berlin, Heidelberg: 2009. xxii + 822 pp. $389. ISBN 978-3-540-85187-5.

This book represents the printed version of the enzyme data information system BRENDA, which was created in 1987 in Braunschweig, Germany and has since been developed into a "full metabolic database", to quote from the Preface. Each volume in the series is arranged by class of enzyme, with some 4000 different enzymes covered and arranged according to their Enzyme Commission (EC) number. Where appropriate, each entry includes information under the following categories: Nomenclature, e.g., EC number, systematic name, recommended name, and synonyms; Source Organism; Reaction and Specificity; Enzyme Structure; Isolation/Preparation/Mutation/Application; Stability; and References. A short list of abbreviations and an index of recommended enzyme names open the book.

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Compendium of Polymer Terminology and Nomenclature: IUPAC Recommendations 2008. Edited by R. G. Jones (University of Kent, U.K.), J. Kahovec (Academy of Sciences, Czech Republic), R. Stepto (Manchester University, U.K.), E. S. Wilks (Hockessin, USA), M. Hess (University of Essen, Germany), T. Kitayama (Osaka University, Japan), and W. Val Metanomski (CAS, USA). Royal Society of Chemistry: Cambridge, 2009. xx + 444 pp. $279. ISBN 978-0-85404-491-7.

This book is an expansion of the 1991 book *Compendium of Macromolecular Nomenclature*. It covers the latest IUPAC recommendations for terminology used in polymer research and nomenclature for different types of polymers, including "regular and irregular single-strand organic polymers, copolymers and regular double-strand (ladder and spiro) organic polymers", to quote from the back cover. It also includes a bibliography of biopolymer-related IUPAC-IUBMB nomenclature.

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Unsigned book reviews are by the Book Review Editor.

Advances in Chemical Physics, Volume 141. Edited by Stuart A. Rice (University of Chicago). John Wiley & Sons, Inc.: Hoboken, NJ. 2009. x + 564 pp. $175.00. ISBN 978-0-470-41713-3.

The epigraph to E. M. Forster's novel Howards End, "Only Connect," might also serve as a fitting motto for the series *Advances in Chemical Physics*. Some special volumes aside, each member of this series is an eclectic mix of chapters devoted to topics of immediate interest in chemical physics and physical chemistry. According to the series editor, the goals of this style of organization are threefold: to encourage the emergence of powerful and new general concepts that transcend the various subfields; to contribute to the broad education of the reader; and finally, to serve as a pedagogical reference for beginners in the field. The141st volume of this widely read and respected series admirably achieves the second two goals. It only remains for the reader to make the connections necessary to meet the first.

The current volume contains seven chapters—each with between 40 and 235 up-to-date references—an author index, and a well-compiled subject index that runs to 18 pages. The first two chapters are broadly focused on the topic of control and pulse shaping. The chapter by Strasfeld, Shim, and Zanni emphasizes the recent technological advances—most importantly the germanium acoustooptic modulator—that have made direct pulse shaping in the mid-IR possible. This opens up the possibility of controlling reactions by controlling ground electronic state vibrations. The chapter by Engel, Meier, and Tannor focuses on theoretical advances in local control theory in which pulses are used to control the sign (and temporal evolution) of the first time derivative of expectation values. A well-written and pedagogical introduction is complemented by several illuminating analytical models. Applications include photodissociation and selective mode excitation. Graduate students in the field will find this chapter especially useful. The third chapter, by Eland, concerns the double photoionization (DPI) of atoms and molecules. Interest in this field stems, in part, from the insights it can provide into electron correlation. However, the author notes that previous DPI experiments have provided little insight into electron correlation in neutral species. To that end, Eland describes new experimental methods, e.g., threshold electron detection and magnetic bottle techniques, that may be used to provide direct information on electron correlation in molecules. A well-selected collection of results in atoms and molecules is presented.

The chapter by Dryfe provides an account of the electrified liquid−liquid (L−L) interface and emphasizes the need for a renewal of overlap between electrochemical studies of the L−L interface and colloid science. The importance of developing an understanding of this interface at the molecular scale so as to be able to control such phenomena as electro-wetting and liquid injection is also stressed. Continuing the mini-theme of interfaces, Buxton and Clarke discuss the physics of solid−fluid−solid films in their chapter. These fascinating systems can feature instabilities that may result in the dewetting of fluid films on substrates or film breakup in free-standing films. In effect, van der Waals forces can corral the fluid into isolated pockets, the

effect of which leads to surface undulations. Again the topic of control appears in the desire to control these undulations, e.g., to engineer optical properties or to use such films for local geometric control of biological cell growth. A theoretical model is presented together with the results of computer simulations. Soft condensed matter systems are also the topic of the chapter by Chakrabarti and Bagchi covering the dynamics of thermotropic liquid crystals. After a brief overview, recent experimental methods are described followed by a summary of theoretical approaches. Especially useful is the list of 10 outstanding problems the authors identify for future research.

The final chapter by Gaiduk and Crothers is a colossal tour de force on the theory of the complex permittivity of ice and liquid water. The stated purpose of this chapter is, quite simply, "describing water/ice spectra and the method of their calculation." The following 184 pages go on to do just that. This is a weighty chapter; e.g., it takes more than four pages to define the symbols used, and yet the approach is direct and well organized. It is taken as self-evident that calculating the complex permittivity of ice is an important problem: rather than discussing the myriad possible applications, the authors focus on the specifics of developing an analytical molecular model to describe the spectra of ice and water. A key goal of the proposed approach is the development of a universal model applicable to both ice and water.

Opening a new volume of *Advances in Chemical Physics* is often an encounter with the unexpected as well as the familiar. This volume is no exception. It provides a fascinating snapshot of the state-of-the-art of several diverse and exciting subfields of chemical physics. Furthermore, it provides an accessible point of entry to each of them. Even in these days of budgetary cutbacks, it should be high on the "essentials" list of any modern research library that covers the physical sciences.

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