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BOOK REVIEWS

Advances in Polymer Chemistry and Methods Reported in Recent US Patents. By Thomas F. DeRosa (City University of New York). John Wiley & Sons, Inc.: Hoboken. xx + 736 pp. $125. ISBN 978-0-470-31286-5.

This reference and guidebook was designed "to provide readers with current polymer chemistry research trends from academic, governmental, and industrial sources reported in US patents for the years 2006 and 2007", to quote from the Preface. Patents were categorized according to the following 23 sections: additives; adhesives; bioactive; coatings; cosmetics; dental; electroactive; energetic polymers; fibers; fluorine; gels; imaging agents; ink; liquid crystals; nanoparticles; new synthetic methods; optical materials; photoactive polymers; polymerization methods; regulators; photoresists; separations; and thermosets. Each entry covers the experimental procedures used to prepare the agent or intermediate under investigation and is referenced with relevant US patents. Many also include methods for preparing derivatives, special notes regarding the procedure, and "testing methods used to assay material efficacy".

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Photosynthetic Protein Complexes: A Structural Approach. Edited by Petra Fromme (Arizona State University, Tempe, AZ, USA).Wiley-VCH Verlag GmbH & Co.KGaA: Weinheim. 2008. xxviii + 360 pp. $230. ISBN 978-3-527-31730-1.

Arguably one of the most important biochemical processes in nature, photosynthetic electron transport provides the linchpin that couples solar energy with biological energy production. Light energy created by fusion, a most violent physical process, is harvested and used to produce biological energy equivalents which support nearly all life on earth. Ably edited by Fromme, this book is a most welcomed compilation by many of the leading scientists in this field. Almost without exception, these authors have seamlessly integrated discussions of structure with those of function. This approach has provided a volume of great utility to graduate students and photosynthetic aficionados alike.

The introductory chapter, which should be clearly understandable by students with a relatively limited background in biochemistry/biophysics, sets the stage quite nicely for the more detailed chapters that follow. Structural in orientation, these contributions provide deep insight into the molecular mechanisms of the apparatus for photosynthetic electron transport. The majority of the chapters coherently integrate the most recent structural information with ongoing biochemical and biophysical investigations. Coverage of the subject material is excellent, with both the major protein complexes (e.g., Photosystem II, the Cytochrome b_6/f complex, Photosystem I, the chloroplast CF_o-CF_1 ATP synthase, and the purple bacterial reaction center) and their antennae (e.g., phycobilisomes, light-harvesting complex II, and the purple bacterial antennae complexes) being examined in detail. In additional chapters, the smaller, mobile electron transport components, including plastocyanin and cytochrome c_6, ferredoxin and flavodoxin, and the ferredoxin-$NADP^+$ reductase are discussed. Finally, other chapters address a number of important topics including the mechanism of oxygen evolution by Photosystem II, the structure of supercomplexes of both Photosystem II and Photosystem I, and the evolution of photosynthetic reaction centers.

This book was very enjoyable and informative to read and should prove to be an invaluable resource for graduate students and other scientists with interests in the structure and function of membrane protein complexes, in general, and photosynthetic electron-transport phenomena, in particular.

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Tin Chemistry: Fundamentals, Frontiers, and Applications. Edited by Alwyn G. Davies (University College London, U.K.), Marcel Gielen (Free University of Brussels VUB, Belgium), Keith Pannell (University of Texas at El Paso, USA), and Edward R. T. Tiekink (University of Texas at San Antonio, USA). John Wiley & Sons, Ltd.: Chichester. 2008. xxii + 730 pp. $270. ISBN 978-470-51771-0.

Tin chemistry is a broad topic that has relevance to such diverse fields as structural inorganic chemistry, synthetic organic chemistry, materials science, and biological chemistry. It is arguably the most studied of the organometallic systems in terms of the techniques used and the breadth of its commercial applications. This latest book on the element is timely, as the most recent offering (*Organotin Chemistry*, Davies, 1997 and 2004) focused solely on organometallic chemistry whereas the more general books (*Tin Chemistry*, ed. Harrison, Smith, 1989, 1998, respectively) are now dated. The editors of any book that attempts to encompass all areas of tin chemistry in a manner amenable to a wide audience and within one volume face a challenge, in terms of selectivity, organization, and timeliness. It is to the credit of the four senior editors, each of whom has spent an academic career working with the element, that they have fashioned such a text.

The stated aim of the work is to review areas, in an authoritative and in-depth manner, that cover the most pronounced recent developments relating to tin in both the pure and applied sciences. To achieve this goal the book contains contributions from approximately 70 scientists, the majority of whom are household names within the tin community, on 40 or so topics spread across five broad areas: fundamentals, materials chemistry and structure, medicinal/biological and environmental chemistry, tin in organic synthesis and in catalysis. This sectionalizing has the merit of grouping research on a common theme to give a clear indication of where an area is heading, though inevitably there is some degree to which the

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division is artificial, the sections on organic synthesis and catalysis being the most obvious.

After a brief introductory chapter, which will benefit newcomers to the field (particularly the list of literature resources available), the book continues with its largest section on fundamentals. It is arguable the extent to which "fundamentals" and "recent developments" are compatible themes, but in general the authors have placed the most recent work into a historical context, which allows the interested reader access to earlier work in each area. The contributions have a strong structural theme that embraces cluster chemistry in its many facets, e.g., macrocycles, stannoxanes, Zintl ions, heterocubanes, etc., unusual bonding modes such as Sn-*f* block bonds, theoretical methods, and the chemistry of the low oxidation state, as in stannylenes, Sn−Sn multiple bonds, etc., where the most significant current developments are taking place. There is a strong link between the content of some of these chapters (e.g., oxo-clusters, mixed-metal species) and those on materials chemistry.

The materials chemistry section is centered on tin oxide and related hybrid materials, sandwiched between the more historical themes of PVC stabilizers and flame retardants, and the emergent fields of sensor technology and NLO materials. The chapter on intermolecular tin-arene structural chemistry seems oddly placed in this context, and its valuable content has more in common with some topics regarded as fundamentals.

The contributions on the biological aspects, which are mainly focused on organotin chemistry, have something of a reflective feel based on the balance of references from before and after 2000. What was once one of the major themes in tin chemistry has inevitably suffered from a greater concern over environmental issues, but as one contributor quite rightly points out, research in this area must continue to lay to rest the notion that all organotin compounds should be banned owing to their toxicity. These contributions make an excellent starting point in understanding the mode of action of organotins, on which the synthesis of more effective compounds can be based.

The final two sections concern the related topics of tin in organic synthesis and in catalysis. The former, like bio-organotin chemistry, is suffering from its lack of green credentials, so the contributions from a number of authors on both supported and fluorous reagents go some way to showing how these problems are being addressed without sacrificing the inherent chemical utility of the reagents. Two major chapters in the section are devoted to aspects of cross-coupling reactions and underscore the continued importance of this application of tin chemistry. There are also three chapters that directly contain "green chemistry" in their titles, one provocatively asking if green organotin chemistry is an oxymoron.

Potential purchasers should be assured that the literature across all these chapters is up-to-date, as are the topics covered. It is notable, for example, that Mössbauer spectroscopy, which would have surely featured widely in older texts, has just one index citation. The book is priced beyond the reach of most individual purchasers but is a monograph that all chemistry libraries should acquire.

Finally, it is with personal thanks that I note the book has been dedicated to the memory of Professor Des Cunningham, a stalwart of the tin community who died in 2006. I am sure I will not be alone in appreciating this kind gesture.

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