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BOOK REVIEWS

Chemically Modified Electrodes. Advances in Electrochemical Science and Engineering, Vol. 11. Edited by Richard C. Alkire (University of Illinois, Urbana, USA), Dieter M. Kolb (University of Ulm, Germany), Jacek Lipkowski (University of Guelph, Canada), and Philip N. Ross (Lawrence Berkeley Lab, USA). WILEY-VCH GmbH & Co. KGaA: Weinheim. 2009. xii + 268 pp. $195. ISBN 978-3-527-31420-1.

The field of chemically modified electrodes has been continuously growing since its establishment approximately three decades ago. This book covers an eclectic set of topics ranging from already classical systems, such as polyelectrolyte-modified electrodes (Chapter 2) and self-assembled monolayers of thiols on gold electrodes (Chapter 5), to relatively recent electrode systems based on nanomaterials. The latter include nanostructured electrodes (Chapter 1), electrodes based on carbon nanotubes (Chapter 3), and surface-attached electroactive nanoparticles (Chapter 4). There is a degree of thematic overlap between Chapters 1 and 3.

The range of topics presented in the book is impressive. It includes the interfacing of electrodes with proteins, electrical communication through molecular wires, electrode surfaces with switchable properties, advanced surface patterning, theory and practice of redox polyelectrolyte films, structure and properties of carbon nanotubes and carbon nanotube-based electrodes, faradaic electroactivity of nanoparticles, electrodeposition of metal on self-assembled monolayers, layer-by-layer assembly, amperometric biosensors, immunosensors, DNA sensors, electrochromic devices, electrochemical actuators, and energy-harvesting devices. The latest developments in these areas are nicely presented in the context of older literature. The references are generally thorough—although, perhaps unavoidably, there are some noticeable omissions as mentioned below—and cover the literature up to 2008. The book keeps a satisfying balance between analytical and physical chemistry aspects of the modified electrodes.

In addition to the exciting topics covered in this book, there have also been other important developments in this field recently that are not covered here, such as advances in electrodeposition of inorganic films for detection of biomolecules, chitosan-enzyme-based biosensors, molecularly imprinted film electrodes, and multicomponent modified electrodes that display synergistic analytical effects. The reader should also be advised to exercise a degree of caution when reading some of the literature reports on the direct interfacing of electrodes with enzymes. In particular, the claims that the direct electron transfer between the unoriented mats of carbon nanotubes and glucose oxidase provides the basis for mediatorless detection of glucose are not sufficiently supported by relevant control experiments. After all, no commercial modified electrodes have been developed for the mediatorless enzymatic determination of glucose thus far, despite considerable efforts.

Overall, this book is a very useful and timely contribution that expertly documents the progress in selected areas of research on chemically modified electrodes. I have enjoyed reading it and strongly recommend it for researchers and graduate students who work or contemplate working in this area. In addition, the book can be used as an excellent resource for teaching advanced graduate elective courses, e.g., in electroanalysis and electrocatalysis.

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Nanoscience and Nanotechnology for Chemical and Biological Defense. Edited by Ramanathan Nagarajan, Walter Zukas (both at Natick Soldier Research, Natick, MA), T. Alan Hatton (Massachusetts Institute of Technology, Cambridge, MA), and Stephen Lee (U.S. Army Research Office, Research Triangle Park, NC). American Chemical Society: Washington, DC. 2009. xiv + 370 pp. $175. ISBN 978-0-8412-6981-1.

This book was developed from among the 80 papers presented at the symposium "Nanoscience and Nanotechnology for Chemical and Biological Defense" held at the 234th ACS National Meeting in Boston, MA in August 2007. There are 24 chapters, which are organized under three headings: Introduction; Detection of Chemical and Biological Agents; and Protection from Chemical and Biological Agents. A sampling of the chapters in sections two and three include "Piezoelectric-excited Millimeter-sized Cantilever (PEMC) Sensors for Detecting Bioterrorism Agents" by Campbell et al. and "Nanostructured Chem-Bio Non-Woven Filter" by Tepper and Kaledin, respectively. Author and subject indexes complete the book.

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Handbook of Transition Metal Polymerization Catalysts. Edited by Ray Hoff (Chemplex Company (retired) and Roosevelt University, Schaumberg, IL) and Robert T. Mathers (Pennsylvania State University, New Kensington, PA). John Wiley & Sons, Inc.: Hoboken, NJ. 2010. xxii + 575 pp. $149.95. ISBN 978-0-470-13798-7.

This book features contributions from leading researchers in the area of transition metal polymerization catalysts. In 16 chapters, it covers the development of such catalysts and their application to the synthesis of polymers. There are chapters on metal alkyls and their use with transition metal polyolefin catalysts, the use of porous silica in transition metal polymerization catalysts, and computer modeling of polymerization catalysts, to name a few. Other topics, such as the scale-up and commercialization of catalysts, polymerization reactivities, and the properties of polymers, are also covered. Appendices on the pyrophoricity of metal alkyls and on rheological terms as well as a subject index complete the book.

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Unsigned book reviews are by the Book Review Editor.

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