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BOOK REVIEWS

Multiphase Homogeneous Catalysis: Volumes 1−2. Edited by Boy Cornils (Hofheim, Germany), Wolfgang A. Herrmann (Universität München, Germany), Istvan T. Horvath (Eötvös University, Hungary), Walter Leitner (RWTH, Aachen, Germany), Stefan Mecking (Universität Konstanz, Germany), Hélène Olivier-Bourbigou (Institut Français du Pétrole, Vernaison, France), and Dieter Vogt (Eindhoven University of Technology, the Netherlands). Wiley-VCH Verlag GmbH & Co. KGaA: Weinheim. 2005. xxxiv + xxxiv + 872 pp. $385.00. ISBN 3-527-30721-4.

This two-volume set brings together a range of approaches to the topic of multiphase homogeneous catalysis. The main topics are Aqueous-Phase Catalysis (75% of Volume 1), Organic−Organic Biphasic Catalysis (10% of Volume 1), Fluorous Catalysis (15% of Volume 1), Catalysis in Nonaqueous Ionic Liquids (45% of Volume 2), Catalysis in Supercritical Solvents (33% of Volume 2), and Soluble Polymer-Bound Catalysts (22% of Volume 2). Since these areas are rather divergent (and not all areas of my expertise), I like that each starts with an introduction to the basic technique before moving to catalysis. Each section is current and thorough, written by an expert in the field. However, the volumes do not have the encyclopedic feel that sometimes occurs with many authors but flow relatively smoothly from one topic to another. For the topic with which I am most familiar, aqueous-phase catalysis, the authors do an excellent, thorough review of the literature; but not just a review, they also provide a teaching component that is more like what you would find in a textbook.

While I am normally rather skeptical of the value of multivolume sets, I was pleasantly surprised by the quality of these two volumes, and they will be a welcome addition to my bookshelf.

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Semiconductor Nanocrystals and Silicate Nanoparticles. Structure and Bonding, 118. Edited by Xiaogang Peng (University of Arkansas, USA) and D. M. P. Mingos (Oxford University, UK). Series Edited by D. M. P. Mingos. Springer: Berlin, Heidelberg, New York. 2005. xii + 190 pp. $179.00. ISBN 3-540-27805-2.

Studies of semiconductor nanocrystals remain a key component in the repertoire of materials chemistry. As these materials enjoy sustained relevance to applications in optoelectronic materials and biological labeling, updated, in-depth reviews of their fundamental properties continue to be a valuable resource to those interested in the field. In this regard, this volume encompasses four distinct chapters that, for the most part, provide a complementary perspective in the important topics of synthesis, electrochemically driven and mechanistic photophysics, and structure.

The range of topics covered in these accounts is often broad. In the first chapter, Bard and co-workers demonstrate the utility of electrochemiluminescence for examining a diverse variety of semiconductor nanocrystals ranging from the paradigm of CdS and the technologically relevant example of Si to the more sophisticated (and stable) heterostructures of ZnS-coated CdSe. Common mechanistic traits are emphasized, along with useful information regarding electronic structure that can be extracted from such measurements. Complementary to this contribution is a detailed account by Guyot-Sionnest who, in a more focused description, stresses the size and surface chemistry dependence of II−VI nanocrystals, such as CdSe, on the detailed photophysics associated with intraband transitions; given the number of possible electro-optical devices requiring species emissive in the near-infrared, this is timely and informative.

One of the broadest challenges associated with semiconductor nanocrystals, however, remains their controlled synthesis. Peng and Thessing effectively summarize those keys to experimental design that dictate size, dispersity, and shape. Their very timely use of "Green" synthons is a welcome part of this toolbox that is being increasingly exploited.

Organizationally, this volume also contains an "outlier", a chapter by Santamaria-Pérez et al. on the structure of complex silicate networks, that does not fit neatly with the other three. To their credit, the authors tackle a very different subject matter with textbook-style clarity that provides logical categories based on symmetry and bonding concepts.

Given the above perspective, this volume in the longstanding *Structure and Bonding* series is a useful compilation of up-to-date reviews regarding semiconductor nanocrystals, especially those of the often-studied II−VI variety. It also continues its tradition of choosing respected scientists in the field that produce lucid papers of value.

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