

## Biorefineries - Industrial Processes and Products, Status Quo and Future Directions. Volumes 1 and 2

By Birgit Kamm, Patrick Gruber and Michael Kamm, Wiley-VCH, Germany, 2006, 964 pp., \$430.

The book on "Biorefineries" is a large collection of articles written by 85 different co-authors on a subject of current importance. Seventeen of the articles appear in volume 1, and 16 articles appear in volume 2. It is indeed a very challenging task for the editors to organize so many disparate articles written in varying styles by a diverse group of "experts". While there is a common theme among the articles, the "book" is closer in content to the proceedings of a conference than a cohesive treatise. The book may be useful to individuals looking for a reference to update themselves on the general subject area. However, other options for updating oneself in this subject area include public Web sites (such as the DOE and NREL web sites), where similar articles can be downloaded for free. In many cases, such articles are

better organized and more cohesive than the articles in the book. An alternative organization of the book may have been to separately examine the biomass feedstock's, products, processes and barriers in different sections and present the topics in a more integrated manner.

The first volume of the book starts with an overview and an interesting historical perspective on biorefinery systems. The second chapter (by Bruce Dale et al.), and the third chapter (by authors from Genencor), provide valuable information on the economic basis for a potential biomass based refinery. There are several chapters that are "in-depth" reviews of high-quality backed by a large number of literature references. However, there are also some chapters that are of variable quality, and end up repeating information in other parts of the book. An example of this type is the fourth chapter on a "Dutch Point of View" on biorefineries that one can quickly skim over. The next several chapters describe biorefineries based on lignocellulose as feedstock. Chapter 9 contains an interesting discussion of Iogen's Demonstration Process for producing

ethanol from cellulosic biomass. A hybrid thermochemical and biological processing is also described where biomass is first converted to syngas, which is subsequently used in a fermentation process. There are also chapters on using different feedstock's such as sugarcane, green plants, plant juices (as fermentation medium), corn and agricultural residues. The second volume of the book contains more material with similar characteristics as in the first volume. There is further discussion on carbohydrate-based products, protein-based polymers, lignocellulosic-based products, oleochemicals and products based on fats (lipids) and oils, phytochemicals and pigments, biobased consumer products for cosmetics, etc. There is a brief discussion at the end of the second volume on economics and commercialization.

In conclusion, the book would have been more valuable if it had a more cohesive organization. However, the book may still be useful for a novice who wants to understand the potential of biorefining and save time exploring the vast literature on the subject.

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Prasad Dhurjati  
University of Delaware  
Newark, DE 19716  
E-mail: dhurjati@udel.edu

## Fundamentals of Electrochemical Deposition (Second Edition)

By Milan Paunovic and Mordechai Schlesinger, Wiley-Interscience, Hoboken, NJ, 2006, 373 pp. \$105.95.

It is a great privilege to review the Electrochemical society series book on "Fundamentals of Electrochemical Deposition" from John Wiley. The book is a very useful one for those who are at university level as a text book, as well as to the scientific community, who are into the research involving electrochemical deposition as a guide. It is also very informative to the industrialists who are involved in the practice of electrodeposition for various applications. The initial chapters include the basic concepts of electrochemistry including introduction to metals, metal-solution interface.

The logical presentation of all the 18 chapters is self contained, and the reader can selectively choose the chapter of interest. This book can definitely serve as a text book for graduate

and undergraduate students, and a resource book for technologists.

The mechanism and kinetics of electrodeposition are well explained. The mechanism of nucleation and growth of the deposits on the substrates, and the formation of different textures is highly useful for those who are into the field of electrodeposition, both on the research side and industrial side. The concepts of alloy deposition and role of additives during electrodeposition are well-explained. The morphological, physical mechanical and magnetic properties of the deposits by use of different characterization techniques are discussed in detail.

The three additional chapters included in the second edition describes the applications of electrodeposition in fields of microelectronics, medical devices and biomaterials for implants. These chapters give an excellent review of the most recent applications of materials produced by electrodeposition in the aforementioned fields. This edition has included some of the topics including Debye-Huckel Theory for ion-ion interaction (Chapter 2), determination of

double layer capacitance (Chapter 4), formation of nanoclusters using STM, etc. (Chapter 7) and stress in the deposits and adhesion (Chapter 13) which give additional information for both students and scientists.

Pulse electrodeposition and reverse electrodeposition are gaining much importance recently due to the improvement in the morphological, mechanical, electrical and magnetic properties of the deposits, the authors should have included a chapter including the basic concepts and review on the pulse electrodeposition, which would have given completeness to the book. Along with the metal-alloy deposition and the role of additives, etc., metal composite deposition along with some basic concepts would have been helpful to the readers on the industrial side. Also, the problems given at the end of each chapter help readers understand and grasp the subject better.

This book will be an asset to many researchers, academicians and technologists working toward product development in order to get the practical knowledge.

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Natarajan Rajalakshmi  
Centre for Fuel Cell Technology  
120 Mambakkam Main Road  
Medavakkam  
Chennai 600 100, India  
E-mail: lakshmiraja@hotmail.com