to that of the original book and is current through 1987. Updates may become available in the future.

Comprehensive Organic Transformations on CD-ROM is an electronic book rather than an electronic database. The single most useful feature is reagent searching. It is not set up to do structure searching, and the transformation (From:To) searches are flawed by an organizational scheme that leads to many false hits. The content is nearly identical to the book, and the cost is half-again as much. For general browsing I do not see that the electronic version offers advantages over the book. I would recommend the CD-ROM version on the basis of its reagent searching feature.

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Book Reviews

Nonionic Surfactants: Organic Chemistry. Surfactant Science Series. Volume 72. Edited by Nico M. Van Os (Shell International Chemicals B.V.). Marcel Dekker, Inc.: New York, Basel, Hong Kong. 1998. xiv + 291 pp. $145.00. ISBN 0-8247-9997-6

This monograph, edited by the late Nico van Os, gives a focused account of the organic chemistry, especially the synthesis, of nonionic surfactants. The chapters are laid out in a consistent manner, and roughly arranged in order of importance to the detergent industry. The contributions are proficiently written by experts in the field, all of whom have industrial affiliations. Reference material is very extensive and generally up to date. Unfortunately, the accessibility of the book is marred somewhat by a poor index.

Since most nonionic surfactants in use are of the polyoxyethylene (POE) type, it is fitting that the first chapter deals with the chemistry of the POE chain. The remaining eight chapters each address a separate type of surfactant, extending beyond what may be considered "organic chemistry". All do, in fact, make excursions into the physical properties, applications, and environmental issues pertinent to the surfactants in question. Chapter 1, written by Charles L. Edwards, emphasizes the factors affecting the POE chain length, and gives an excellent account of polymerization catalysts. In the second chapter, Robert M. Weinheimer and Pierre T. Varineau cover POE alkylphenols, presenting a brief treatment of manufacture, and a comprehensive discussion of product composition. The authors manage to convey a great deal of information by the inclusion of 33 tables in this section. The third chapter, also written by C. L. Edwards, takes a similar approach to POE alcohols. In this treatment, the emphasis is more on synthesis and preparation, and less on properties and applications. A useful breakdown of the physical properties of a large number of commercial products is, however, presented. In the following chapter on POE esters, Kurt Kosswig covers the material in a similar manner, with only brief attention given to nonproduction aspects such as toxicology and biodegradation. Chapter 5, once again written by C. L. Edwards, deals with POE mercaptans. In keeping with the lesser importance of this class of surfactants, this is a short treatment that briefly describes the salient points of synthesis, properties, and applications of these compounds. Chapter 6, on POE alkylamines, is written by Michael D. Hoey and James F. Gadberry and is still more condensed. Most emphasis is placed on synthetic aspects of these quasi-ionic surfactants. In Chapter 7, Anna Lif and Martin Hellsten describe nonionic surfactant containing the amide group. Their treatment is somewhat more extensive than that of the previous two chapters, especially with regard to surfactants containing both amide and carbohydrate groups. Chapter 8, by Jeremy Lewis, deals with polyol ester surfactants. It gives a detailed account of these compounds, separately describing glycol, glycerol, polyglycerol, sorbitan, sucrose, and polyoxyalkylene polyol esters. Last but not least, Ansgar Behler, Karlheinz Hill, Andreas Kusch, Stefan Podubrin, Hans-Christian Raths, and Günther Uphues discuss nonionics as intermediates for ionic surfactants. They deal with the conversion of POE surfactants to various ionic adducts, including sulfates, sulfonates, phosphates, carboxylates, and quaternary ammonium compounds. The emphasis is on preparation, with a fair dose of properties, toxicology, and analysis added. The material is especially exhaustively referenced.

The usefulness of this monograph is greatly enhanced by its emphasis on existing commercial detergent products, including trade names, manufacturers, and country or origin. It is a well-conceived and well-executed piece of work, which deserves high recommendation.

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Bioinorganic Chemistry: Trace Element Evolution from Anaerobes to Aerobes. Structure and Bonding Series, #91. Edited by R. J. P. Williams. Springer: Heidelberg. 1988. 207 pp. ISBN 3-540-63548-3.

The volume contains four chapters, Biological Nickel by J. C. Fontecilla-Camps, Nickel in F_{430} by J. Telser, Hemeproteins in Anaerobes by I. A. C. Pereira, M. Teixeira, and A. V. Xavier, and Evolutionary Aspects of Copper Building Centers in Copper Proteins by B. Abolmaali, H. V. Taylor, and U. Weser. Dealing with proteins containing the elements nickel, iron, and copper, the volume elaborates on the notion that evolutionary expediency led to the prevalence of nickel proteins in anaerobes whereas copper was exploited by aerobic organisms. Iron-containing proteins span both classes. The first chapter deals mainly with the nickel-containing proteins urease, hydrogenase, and carbon monoxide dehydrogenase (CODH). Included are the proposed or real metal-building sites of the proteins and a discussion of the mechanisms of enzyme action. This chapter represents a useful summary of the current views of the subject. The following chapter, on F_{430}, deals with the structure and physical properties of the macrocylic nickel building site which is involved in the conversion of carbon dioxide to methane. Included is a discussion of the role of the macrocylic ligand in controlling the oxidation state changes of the nickel atom. The chapter on heme proteins may have less appeal to inorganic chemists because the approach to the subject is more biochemical than chemical. This is perhaps because the heme proteins appear to serve as redox reagents. The final chapter, dealing with the evolution of copper proteins and the structures and functions of most of the known copper proteins is probably the most stimulating. Inorganic chemists interested in biological copper should read this chapter. It contains a description of how the earth's early harsh environment led to the adaptation of certain metalloproteins. As a more oxygen-rich atmosphere developed, various new metalloproteins began to appear in order to take advantage of the dioxygen. In particular, an extensive variety of copper proteins evolved, most of which are involved directly or indirectly with reactions of dioxygen. The chapter provides a comprehensive survey of copper proteins. It includes the known structures of the proteins and their functions. An inorganic chemist will find a fascinating variety of unusual structures and chemical transformations.

Aside from the intrinsic interest in the metalloproteins described here, the potential for developing new, important, practical catalysts by taking clues from biology is one of major goals in understanding the mechanisms of the biological systems. The present volume provides a useful summary of how biology has employed common transition metals in a number of intriguing catalytic transformations.

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