task. Nevertheless, it must be mentioned that some aspects are missing: I would have expected to find contributions on ab initio molecular dynamics calculations, on cluster methods, and a separate one on the calculation of "properties". For many experimental chemists the calculation of molecular properties is of central importance.

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DNA Arrays. Methods and Protocols. Edited by *Jang B. Rampal*. (Series: Methods in Molecular Biology, Vol. 170.) Humana Press, Totowa 2001. 264 pp., hardcover $ 89.50 (ca. € 98).—ISBN 0-896-03822-X

The aim of this book is to give an overview of the current situation in DNA microarray technology, and to provide protocols that will help new starters in the field to set up systems for DNA array analysis, even in laboratories without special facilities for such work. The research field of DNA microarrays, which is still quite new and has a large interdisciplinary element, is described in 17 chapters by authors drawn almost exclusively from industry. This reflects the commercial importance of microarray technology, which is further emphasized by a chapter giving details of the companies engaged in the field and discussing the commercial prospects. A chapter on ethical aspects discusses some of the questions that arise, such as the possibility of compulsory DNA diagnostic tests, the need for individual data protection in view of the ease with which comprehensive genetic data can be communicated electronically, and the possibility that insurance companies and employers may discriminate against higher risk groups. Other chapters dealing with more general aspects are the introduction by Edwin Southern, the brief reviews of confocal fluorescence analysis of DNA arrays, and the chapter on bioinformatics technology, which must assume a key role in the processing of the enormous quantities of raw data on hybridization analyses.

Several chapters are devoted to the preparation of nucleic acid arrays. For example, one of these describes the synthesis of DNA arrays by photolithography. It includes laboratory recipes and NMR data for phosphoramidites with photolabile protecting groups attached, reproduced from the original publications, but one may question how interesting and relevant these are from a practical standpoint, as few laboratories are likely to have facilities for the laborious photolithography. The preparation of gel-immobilized nucleic acid arrays is a simpler procedure. However, the chapters on this technique only describe the coupling chemistry involved in a very general way, and refer one to the original papers for details. Also they do not give protocols for using such arrays, but only schematic diagrams and literature references. Two chapters describe the preparation of DNA arrays by ink-jet and printing methods. Here there are detailed protocols for some of the procedures, but for the average user they are likely to be of little help, as they are very specific to the particular microdispensers and automatic plotters referred to. That criticism applies even more to the chapter on automated genotype classification using mass spectrometry equipment made by Sequenom of the USA.

Six chapters are devoted to describing practical applications of DNA arrays. They contain some useful and widely applicable protocols for the hybridization analysis of RNA and for analyzing nucleic acids by tandem hybridization; these methods could also be useful for some other related investigations. The chapter on "DNA Sequencing by Hybridization" (SBH) describes three variants of the technique, which is still under development. The purpose of the SBH method is to apply DNA arrays to study known gene sequences and mutations, or even to sequence unknown new genes. Several protocols for SBH are given. The chapter on the preparation of oligonucleotide arrays in searching for effective antisense reagents is especially useful, as it not only gives some generally applicable laboratory protocols for procedures such as the surface activation of glass supports, but also contains detailed diagrams of apparatus and reaction vessels. The chapters on applications of DNA microarrays for determining HLA types and for gene expression analysis also contain some useful experimental details.

The appearance of this book on the technology of DNA microarrays is certainly to be welcomed, as the subject is complex and very few well-proven methods are yet available. Unfortunately, however, many of the protocols given here are described in a superficial way, and would only be useful to experts who already have a detailed knowledge of the subject. The book by itself is unlikely to give readers a clear overall impression of this area of research. The arrangement of the subject matter within the chapters is not systematic, and adequate cross-references between chapters are not given. The literature coverage extends only up to 1999, and consequently does not include the most recent developments in this rapidly moving field, so that some parts of the book are already out of date. Nevertheless, it should be of interest to postgraduate students and postdoctoral researchers who have begun work on DNA arrays and need a broader view of the field, together with useful tips for solving practical problems.

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Inorganic and Organometallic Polymers. By *Ronald D. Archer.* John Wiley & Sons Inc., New York 2001. xii + 247 pp., hardcover £ 64.50.—ISBN 0-471-24187-3

This book by Ronald D. Archer reminds us that as well as organic polymers the area of inorganic and organometallic polymers is attracting increasing interest. On page 2 the author defines inorganic polymers as polymers with inorganic repeating units in the backbone, and organometallic polymers as those with a backbone alternating between a metallic element and an organic linkage. But the book also describes examples of polymeric metal complexes in which a metal forms bonds with, for example, oxygen, sulfur, or nitrogen. But these are not organometallic polymers. The author forgot to point out that a field called

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"macromolecular metal complexes" covers all these kinds of polymers, including also those in which a metal is bonded covalently, coordinatively, or ionically to a polymer chain or network (only considered briefly on page 19). Macromolecular metal complexes are treated in some books, several reviews, and regular IUPAC conferences. But this is never mentioned in the book. Only very few examples of the now extensive literature on three-dimensional coordination polymers are given (page 15), and the well-known polymeric phthalocyanines are not treated. Because polymeric metal complexes are also treated in the book, a more appropriate title would be "Inorganic, Organometallic and Metal Complex Polymers".

Chapter 1 is entitled "Inorganic Polymers and Classification Schemes". As already mentioned, not only inorganic and organometallic polymers but also examples of other types of combinations of polymers and metals are given, which are classified in different ways as follows: classification by connectivity (number of atoms attached to a metal); classification by dimensionality (1-, 2-, 3-dimensional structures); classification between Type I (metal atoms as part of the polymer backbone), Type II (ligand of a metal complex as part of the polymer backbone), and Type III (metal anchored to a polymer backbone). The latter three-type classification was not introduced by the author mentioned on page 17 but by me in a book published in 1996. Archer gives a further classification into metal-containing polymers (metal coordination polymers, organometallic polymers, metallocene polymers) and main group inorganic polymers (polysiloxanes, polysilanes, polymeric phosphacenes, polyheterophosphazene, polyoxothiazenes). All these systems of classification are confusing because examples are distributed under them. It would be better to treat examples of metals in polymers using only one method of classification, and then to mention briefly that other classifications exist.

Chapter 2 treats "Inorganic Polymer Synthesis" (a better title would be: Synthesis of Inorganic, Organometallic, and Metal Complex Polymers!). This chapter is subdivided with examples of step-growth synthesis, chain polymerization, ring-opening polymerization, reductive coupling and redox polymerization reactions, and condensation oligomerizations/polycondensations. It is very valuable to get information about methods for the preparation of compounds with the combination of metals in polymers. But some important results are missing. For example, electropolymerization is mentioned only with thiophene-containing Schiff bases and polypyridyl complexes on page 65. But numerous papers and reviews exist describing the electropolymerization of suitable substituted porphyrins and phthalocyanines (mainly published in the period 1990–2000).

Chapter 3 describes various methods for characterization: determination of molecular mass, gel permeation chromatography, end-group analysis, determination of thermal parameters, spectroscopic methods (MS, NMR, ESR, UV/Vis/NIR, IR, Raman, Mössbauer, X-ray). This 80-page chapter contains very useful examples of the analysis of polymers containing metals. But in most cases the fundamentals of these methods are also treated over several pages, which is not necessary here and does not contribute to the aim of the book.

Lastly Chapter 4 concentrates on the practical chemistry of such polymers. This means in general the properties of these materials and some applications. Inorganic elastomers, interface coupling reactions, dental polymers/adhesives, medical polymers, high temperature polymers, lithographic resists, preceramics, conductivity NLO, luminescent polymers, magnetic materials, and catalysts are mentioned. This chapter is very useful, even though some properties are missing, such as electrocatalysis (for fuel cells) and photoelectrochemistry. Most chapters describe only very few examples, e.g., for catalysts, conducting materials, and porphyrins in energy or electron transfer.

Some criticisms have been mentioned at the beginning of this review and in discussing the main chapters of this book. Summarizing now, the book presents a good overview with selected examples. Each chapter contains some exercises. The formulas and figures are clear and free of errors. Therefore this book is valuable for students in advanced courses of macromolecular chemistry and material science. Experts in the field of metals in polymers are better served by more extensive books and reviews. Unfortunately, books and reviews of this field are only rarely mentioned in this work.

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Fundamentals of Electroanalytical Chemistry. By *Paul M. S. Monk.* (Series: Analytical Techniques in the Sciences.) John Wiley & Sons Inc., New York 2001. 361 pp., softcover £ 34.95.—ISBN 0-471-88140-6

This series of books is intended as a resource for distance-learning of analytical techniques. From that point of view, the book fulfills its aims. It consists of ten chapters describing the main techniques for which equipment is commercially available. Each chapter contains self-assessment questions so that the reader can frequently check his or her understanding of the methods presented; the answers to these questions are given at the end of the book in a condensed format.

The book starts with an explanation of electrochemical nomenclature and methodology, which follows the IUPAC recommendations. However, the author has mostly chosen the "non-Cartesian" convention of plotting negative potentials to the right and positive potentials to the left. This so-called "polarographic convention" or "American convention" should be banned from modern textbooks, as it is a potential source of confusion for non-electrochemists. Indeed, the book contains current versus potential curves where sometimes the cathodic current is given as positive and sometimes as negative.

As a matter of fact, even the author gets confused, as for example on page157, where one reads "the oxidation occurs on the forward scan of the CV, with the oxidation taking place during the reverse part". The correct text should have been "reduction occurs when the current is negative [although shown as positive, p.158], and oxidation when the current is positive".

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