with a discussion of that group's recent work on the use of chemically functionalized silicon nitride tips to study the frictional properties of chemically modified surfaces, while the Tsukruk article extends this work to the study of model organic surfaces (self-assembled monolayers).

Considering the cost of the book, it is worth commenting on the quality of the figures and the referencing. The good news is that, for the most part, the reproductions of the scanning probe images are of decent to high quality. Unfortunately, the same cannot be said about the quality of the line art (schemes, diagrams, and the like), which is often disappointing and certainly detracts from the overall quality of the volume. Finally, it is clear that the editors paid attention to keeping the references as up to date as possible. Most references are within 5 years of the symposium date, which is about as current as one can expect in a book such as this (citations up to early 1997 are included).

Curtis Shannon, *Auburn University*

JA985739B

10.1021/ja985739b

Matrix-Isolation Techniques: A Practical Approach. The Practical Approach in Chemistry Series. By Ian R. Dunkin (University of Strathclyde). Oxford Press: New York. 1998. 242 pp. $105.00. ISBN 0-19-855863-5.

This book does a wonderful job of covering the practical aspects of matrix isolation and is a must for any matrix isolation research group or any researchers considering applying the technique to their chemical problem. For the beginner, it offers a step-by-step guide on how to set up the necessary equipment and carry out the experiments. For the expert, it is a handy compendium of practical tips and suggestions. The book is divided into six chapters, with the first four being a "how-to" and the last two covering typical matrix isolation experiments, with the only omission being the use of lasers for generating matrix species.

The first chapter gives the background for the matrix isolation technique and what one might hope to accomplish using the technique. The second chapter gives the nuts and bolts of how to actually put a cold cell together from scratch. The chapter covers all of the important points regarding closed-cycle and open-cycle refrigerators, temperature measurement and control, vacuum systems, and sample holders as well as the care and maintenance required for a matrix isolation system. The third chapter covers coupling the cold cell with various spectroscopic techniques as well as sample preparation and the generation of reactive species. The fourth chapter discusses how to prepare matrixes and gives a variety of useful protocols, as well as discussing the various issues involved when manipulating gases and volatile materials in vacuum lines.

The final two chapters present a variety of actual matrix experiments. The fifth chapter discusses photochemistry in matrices and spectroscopy using plane-polarized light, which seems to be the author's area of interest. The final chapter gives a compendium of "Classic Matrix Experiments" which is very useful. This chapter explains, in detail, how to perform a variety of matrix experiments. The species presented in these experiments cover a wide variety of experiments where matrix isolation is a useful tool for determining what is occurring on a molecular level. The author begins with stable molecules, moves on to forming molecular complexes in matrices, and concludes with forming reactive species for study in matrices. The last chapter is a wonderful guide for anyone who is just beginning in matrix isolation. One can easily find an experiment to use as a check for determining if ones matrix setup is working properly or to show that a new student has the technique down. This book is absolutely essential for anyone who is interested in learning the various intricacies of the matrix isolation technique.

Stephan B. H. Bach, *The University of Texas at San Antonio*

JA9857099

10.1021/ja9857099

Expanded, Contracted & Isomeric Porphyrins. By Jonathan L. Sessler and Steven J. Weghorn (University of Texas at Austin). Pergamon Press: New York. 1997. 503 pp. $48.50. ISBN 0-08-042093-1.

This monograph is a comprehensive overview of organic synthesis devoted to expanded, contracted, and isomeric porphyrins. Considering the extent of worldwide research on "the pigment of life", it is amazing that the structural modification of the chromophoric macrocycle itself is just beginning to attract the attention of the broader scientific community. This book contains all that is needed to secure more well-deserved recognition for this field. Comprehensive and very well written, it is rewarding for both specialists and readers from allied fields with little expertise. It consists of 10 chapters with 856 references to early as well as current literature, and a subject index. Numerous illustrations present the structures of the final conjugated macrocycles and their cation complexes, frequently supported by X-ray data, and succinct synthetic schemes.

The introduction chapter is followed by a review of synthesis and metalation chemistry of contracted porphyrins. A puzzling ring contraction of isomeric porphyrins, indicative of the serendipity and pioneering spirit often encountered in this book, and the elegant ring expansion of subphthalocyanines, pointing toward supra- and macromolecular perspectives of this field, may be particularly impressive. In addition, chapter 2 includes questions on aromaticity related to the macrocyclic analogy of benzene and its "contracted" cyclopentadiene anion, or to nitrogen-, oxygen-, and sulfur-bridged [18]annulenes. After a concise summary of the probably least explored isomeric porphyrins in chapter 3, the major topic of the book, expanded porphyrins, follows. Chapter 4 emphasizes many elaborate ways to insert oligoene, oligoyne, cumulene, and arene units into the original porphyrin framework to give beautifully circular torands, dibenzofuran cavitands, and so on. Somewhat surprisingly, the organic dye with the highest molar extinction known today (1.6 millions (!) for the sharp Soret band of a vinylogous tetraoxaporphyrin) appears in this chapter as well. Many of the structural motifs introduced here are revisited in the subsequent chapters on larger rings. It is satisfying to note that the complete coverage of pentapyrrolic systems includes some oligomers and conjugates that serve as effective reminders of the applicability of "advanced" porphyrin chemistry to expanded, isomeric, and contracted systems (chapters 5 and 6). Further ring expansion leads to the expected bathochromic shifts and multiple cation-binding domains (chapter 7). However, beginning with octapyrrolic systems, a remarkable structural change occurs: the few higher oligomers prepared so far have a marvelously twisted "figure-eight" conformation instead of the familiar planes (chapter 8). The book concludes with an excursion on the Schiff base chemistry in expanded nitrogen-bridged macrocycles (chapter 9) and an introduction to applications that emphasizes contrast agents, photosensitizers, catalysts for oligonucleotide cleavage, and mediators of anion transport (chapter 10).

Readers of this monograph will experience the fresh flavor of a juvenile field throughout a very readable and well-referenced text. Naturally, most attention is given to a contemporary account of synthetic feasibility. Readers other than synthetic chemists who miss a similar treatment of their particular interests could (and maybe should?) be enticed to make the field ready for equally stimulating monographs on physical, spectroscopic, catalytic, supramolecular, and biological aspects of these sophisticated macrocycles.

Stefan Matile, *Georgetown University*

JA985779F

10.1021/ja985779f