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## Book review

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*Pyrolytic methods in organic chemistry*; by Roger F.C. Brown, Academic Press, Inc., New York, 1980, xii + 347 pages, \$ 38.50.

Of the many chemistry monographs published each year, only a few emerge as truly outstanding contributions that are read by many chemists, even those outside the immediate field of interest, and remain useful books for many years. It is my belief that this monograph will turn out to be one of these exceptional volumes. It is timely and well written, and presents an extensive and exceedingly diverse body of chemistry in such a way that the fundamental unifying principles can be easily perceived by the reader.

The book contains a large amount of experimental data and the selection of specific results used to illustrate generalizations was excellent. Emphasis is definitely on the overall reaction but mechanistic considerations are presented throughout. The discussions of mechanisms are brief, but adequate enough to lead the interested reader to the original literature. Although much of the author's work is included, it does not dominate the material presented. Discussions of the relationship of studies involving pyrolysis to those in other fields, such as photochemistry, mass spectroscopy, and synthesis, are numerous. The presentation of alternative explanations, comments about the influence of the specific pyrolytic technique used in a given study on the results of the study, and suggestions for the use of alternative pyrolytic techniques are found throughout the book and clearly reflect the author's experience in the field.

The book consists of nine chapters. Chapter 1 includes a brief history of pyrolytic methods in organic chemistry and a concise survey of modern methods illustrated with well chosen, specific examples. Chapter 2 describes the apparatus and methods. It is a detailed chapter which makes liberal use of diagrams and photographs and includes excellent comparisons of the various techniques. In the Preface, the author states that the intention of the volume is to encourage chemists who are unfamiliar with pyrolytic methods to use them readily. Certainly Chapter 2 makes it clear to the reader that much of the work described in the book can be carried out with simple, inexpensive apparatus. Chapters 3 to 9 describe pyrolytic reactions. The reactions are grouped together in several different ways. In some of the chapters similar reactive intermediates are involved: in Chapter 3 the reactions involve free radicals, arynes, and cyclobutadienes, three very reactive groups of species that dimerize rapidly; in Chapter 5 the reactions involve carbenes and nitrenes. In some of the chapters the overall processes are the same: in Chapter 4 the reactions are elimination reactions; in Chapter 7 the reactions, which include, for

example, the retro-Diels—Alder reaction, are cleavages of carbocyclic systems; in Chapter 9 the reactions are rearrangements without fragmentation, i.e., isomerizations. Finally, in some of the chapters, the formal structure of the starting material is common: in Chapter 6, the reactions involve the fragmentation of cyclic structures; in Chapter 7, the reactions involve the fragmentation of acyclic structures. Throughout these chapters the organization is reasonable and useful and provides an excellent framework for unifying much diverse and seemingly unrelated chemistry.

The diagrams and structures in the book are well drawn and accurate, and the book is essentially free of typographical errors. Organic chemists in all fields should find this book of interest and in view of the reasonable price, it should be on the library shelf of all active organic chemists.

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