Systematic Structural Modifications in the Photochemistry of β,γ-Unsaturated Ketones. I. Cyclic Olefins [*J. Am. Chem. Soc.,* **97,** 145 (1975)]. By PAUL S. ENGEL* and MARY A. SCHEXNAYDER, Department of Chemistry, Rice University, Houston, Texas 77001.

Replace the captions for Figures 1 and 2 with:

Figure 1. Molecular orbital view of intermolecular oxetane formation from a ketone and an electron-rich olefin.

Figure 2. Molecular orbital representation of the first excited singlet state of a β,γ-unsaturated ketone and two possible photoreactions.

Book Reviews

^{13}C-Kernresonanzspektroskopie. By J. T. CLERC, E. PRETSCH (Eidgenossische Technische Hochschule, Zurich, Switzerland), and S. STERNHELL (University of Sydney, Australia). Akademische Verlaggesellschaft, Frankfurt am Main, Germany. 1973. viii + 143 pp. DM 38.

The increasing availability of fast Fourier transform ^{13}C magnetic resonance spectrometers combined with the concomitant proliferation of articles dealing with the manifold applications of this powerful instrumental technique has created a need for clear, comprehensive texts on cmr directed toward the organic chemist. To date, two excellent books, those of Levy ("Carbon-13 Nuclear Magnetic Resonance for Organic Chemists") and Stothers ("Carbon-13 NMR Spectroscopy") have admirably fulfilled this goal. Clerc, Pretsch, and Sternhell have now added a German-language entry, " ^{13}C-Kernresonanzspektroskopie," a clearly written introduction to the principles and practice of carbon magnetic resonance spectroscopy.

The book is effectively divided into two parts: Three introductory chapters briefly describe the basic principles of pulsed nmr, explain the phenomena of spin-lattice and spin-spin relaxation, and outline the important classes of carbon chemical shifts. The remaining four chapters are largely concerned with cmr practice: a description of the various types of multiple resonance experiments, a short discussion of nmr solvents (including a useful set of spectra of the most common solvents), extensive tables of chemical shifts for the major classes of compounds as well as a guide to the interpretation of spectra, and a short introduction to the practical operation of the spectrometer. Overall the explanations are clear and to the point. By far the greatest part of the book is devoted to the tables of chemical shifts (74 out of 135 pp). Each major compound class is treated in one or two pages which include the applicable additivity rules and leading references. The emphasis is on clarity rather than completeness of presentation. For example, the additivity rules used for alkanes are those of Grant and Paul, while the more complex as well as more precise rules of Lindemann and Adams are referenced. The tables are easy to use, even for the non-German-speaking chemist. The chapter on multiple resonance is especially clear; the various decoupling techniques, including gated decoupling, are illustrated by representative spectra and compared as to relative advantages. The final chapter will be particularly useful to the chemist seeking a practical introduction to instrumental operation. The list of general references is relatively short (34 citations) and the index is mainly to specific compounds contained in the tables. There are relatively few minor errors (the spectra on page 41 appear to be of isobutyl alcohol rather than isopropyl alcohol).

This new book is not as comprehensive as either the Levy or the Stothers texts. Treatment of "special applications of limited importance" has been intentionally omitted, and those chemists already well acquainted with cmr principles and techniques will find little that is new. On the other hand, the readable outline style will serve as a useful review for the initiated and a helpful introduction to the novice. Translation into English would serve a wider audience.

David E. Cane, *Brown University*

Highlights of Organic Chemistry. By WILLIAM J. LE NOBLE (State University of New York—Stony Brook). Marcel Dekker, Inc., New York, N.Y. 1974. xvii + 976 pp. $19.50.

Presumably there is some method in the Editor's madness in selecting a classically trained, middle-aged chemist with no credentials in physical or theoretical organic chemistry to review this book. Let me say at the outset that I learned a great deal as I skimmed through all the chapters, reading only a few in depth. And I expect to learn much more as I continue to refer back to it. Professor le Noble has assembled and organized a remarkable spectrum of topics centering around reactive intermediates in large part but also emphasizing structural features such as aromaticity, stereochemistry, conformational analysis, and strain and steric hindrance. The chapters on nitrenes, carbenes, radicals, carbonium ions, and carbanions contain very up-to-date examples which bear on the structures of these intermediates as well as on the nature of their transformations. The text can be wholeheartedly recommended for a course in which these topics are emphasized.

Professor le Noble's style is very engaging. While reading certain passages, it was as if I could almost hear him delivering the lecture. In other words, it is a very personal approach and that flavor enhances the quality of the book. I think his comments about the state of many controversial topics is likely to stimulate some new experiments.

I have only a couple of caveats. His introductory remarks about stereochemistry were somewhat disconcerting. To find a section entitled "configuration vs. structure" is a bit startling. He goes on to say ". . . configurations are interconvertible by twisting motions (on paper only), whereas isomeric structures are distinguished by the feature that interconversion without the breaking of bonds is not even conceivable." If that does not confuse or mislead beginning graduate students, I should be greatly surprised. Also he continues the use of the term optical isomers which I believe leading authorities are trying to blot out of our vocabulary.

The section concerning the rules of structural theory also tended to be misleading. Frankly, I had never seen these rules formulated in this way. In this context they serve as straw men which are demolished with numerous examples. For example, rule one states: Each kind of atom has a single valence number. Then we are shown examples of stable carbonium ions and free radicals, carbenes, etc., that violate that rule. Again an experienced chemist understands what he is getting at, but I foresee trouble for a neophyte.

This is truly a Highlight of (Physical) Organic Chemistry and is recommended to all readers who enjoy the intricacies of organic chemistry, even old timers of my vintage.

Jeremiah P. Freeman, *University of Notre Dame*

Group Theory and Chemistry. By DAVID M. BISHOP (University of Ottawa). Oxford University Press, London. 1973. xvi + 294 pp. $27.25.

From the author's preface: "This book is written for chemistry students who wish to understand how group theory is applied to chemical problems. Usually the major obstacle a chemist finds with the subject of this book is the mathematics which is involved;