

Book Reviews

Methods in Free-Radical Chemistry. Volume 1. Edited by EARL S. HUYSER, Professor of Chemistry, University of Kansas, Lawrence, Kan. Marcel Dekker, Inc., 95 Madison Ave., New York, N. Y. 1969. xi + 208 pp. 16 × 23.5 cm. \$11.75.

This book is the first of a series intended, as stated by the Editor, to "... provide a vehicle in which young practicing scientists... could discuss in their own manner a particular area of their interest." As such, it consists of three chapters of rather varying level of sophistication and depth. The first, on "Free Radical Study by Electron Paramagnetic Resonance" by Larry Keven, is essentially a short treatment of the principles underlying the operation of an esr spectrometer and the analysis of various quantities observed in esr spectra: line shape, width and intensity, and hyperfine splitting. It might form a useful introduction to someone unfamiliar with the subject but contains nothing not covered in more comprehensive treatments. It also omits a number of topics. While methods of generating radicals for esr study are mentioned briefly, there is little attention to their relative merits, or the all important question of radical lifetimes and concentrations in making actual observations.

Chapter 2, "Free Radicals and Photochemical Reactions," by D. C. Neckers, is also rather introductory and is largely restricted to three topics, ketone photolyses, singlet oxygen reactions, and dienone rearrangements. Only the first is treated in any depth and

unfortunately contains a number of at least misstatements. Thus, in discussing Norrish type II reactions, "The remarkable selectivity for γ hydrogens for intramolecular hydrogen abstraction was first noted by Norrish." The products were noted by Norrish, the demonstration of mechanism came later. "Competing with the cleavage of the carbon chain is a low quantum yield cyclization reaction." Actually it is sometimes the major reaction path. Finally, "Polar solvents enhance the quantum yield... by causing a rapid exchange of the hydroxylic proton in the reaction intermediate, thus stabilizing the intermediate." Wagner's suggestion was that they stabilized the intermediate (probably by hydrogen bonding) and thus retarded the reverse reaction.

Chapter 3, "Free Radical Chlorination of Organic Molecules" by M. L. Poutsma, is a comprehensive critical review and far and away the best part of the book. In fact, it is the best treatment of the subject available that I know of, and nicely blends mechanistic interpretation with practical advice as to choice of reagents in carrying out chlorinations for synthetic purposes. If this series is to be of use to investigators actively engaged in free-radical chemistry, subsequent volumes need to be held to this sort of level, since introductory essays are already widely available.

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