

Book review

Organic Reactions, Vol. 20, W.G. Dauben (editor-in-chief), John Wiley & Sons, Inc., New York, 1973, ix + 494 pp., \$22.50.

The twentieth volume of this well-known series contains the first major review of the use of halomethyl-zinc compounds in the synthesis of cyclopropanes from olefins. Iodomethylzinc iodide, reported first by Emschwiler in 1929, became an important organometallic reagent in 1958 when Simmons and Smith of the E.I. du Pont de Nemours Company reported that this product of the reaction of diiodomethane with a zinc-copper couple transfers CH_2 to olefins, giving cyclopropanes. Although other CH_2 transfer systems which could be similarly applied to cyclopropane synthesis were known prior to 1958, and although still others were developed subsequently, the "Simmons-Smith reaction" and its various modifications and improvements remain the most useful and generally applicable procedures.

In the present 131 page review by H.E. Simmons, T.L. Cairns, S.A. Vladuchick and C.M. Hoiness, such CH_2 transfer from organozinc reagents is exhaustively and critically reviewed. Discussed are the nature of the zinc reagents, the mechanism of the CH_2 transfer reaction, relative rates and stereoselectivity, functional group effects in the olefin, scope and limitations and reaction conditions. Also mentioned are those variations which permit the use of related organozinc reagents in Wittig-type carbonyl group methylenation. As in all "Organic Reactions" chapters, there are provided detailed representative experimental procedures and an exhaustive tabular survey, giving in this case all examples of the application of organozinc compounds as cyclopropanation reagents (as found in the literature through January, 1973). This excellent chapter will remain the definitive review of this subject for some time to come.

An added feature of potential utility is provided by a novel experiment on the part of the editors of "Organic Reactions". The authors' working technical abstracts for all 346 references covering the organozinc route to cyclopropanes prior to mid-1972 are reproduced in seven microfiche cards which are inserted in an envelope attached to the inside back cover of the book. It is the purpose of these abstracts to provide a link between the brief tables and the original articles. If this experiment is successful in terms of acceptance by the users of this book, much of the detailed tabular material in future volumes of this series may be supplied by means of microfiche cards.

The other chapters in this volume, "Sensitized Photo-oxygenation of Olefins", by R.W. Denny and A. Nickon, "The Synthesis of 5-Hydroxyindoles by the Nenitzescu Reaction", by G.R. Allen, Jr., and "The Zinin Reduction of Nitroarenes", by H.K. Porter, are listed without comment since they are wholly organic in nature.

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