

Book reviews

Topics in Current Chemistry 109; Wittig Chemistry. (Managing Editor F.L. Boschke), Springer-Verlag, Berlin etc., 1983, 233 pages, DM 108.

This monograph is dedicated to Prof. G. Wittig on the occasion of his 85th birthday in 1983, a year which is also the thirtieth anniversary of his first publication on phosphorus ylides in the Wittig reaction. It consists of five reviews, four of them concerned with chemistry arising from Wittig's own work.

The first chapter, by D. Hellwinkel, deals with "Penta- and Hexaorganyl Derivatives of the Main Group Elements" (63 pages, 192 refs.), and appropriately so since Wittig's discovery of phosphorus ylides was made in the course of his attempts to make the first pentaorganylphosphorane. It is a very readable account, in which a comprehensive and up-to-date outline of the topic is combined with specific recognition of Wittig's pioneering contributions. This chapter is of direct interest to organometallic chemists.

The longest chapter (79 pages, 296 refs.) is concerned with "Selected Topics of the Wittig Reaction in the Synthesis of Natural Products", and is by H.J. Bestmann and O. Vostrowsky, who have themselves made a major contribution in the field, and will be primarily of interest to synthetic organic chemists. Appropriately the following chapter (24 pages; 58 refs., many with multiple entries), by H. Pommer and P.C. Thieme, is concerned with "Industrial Applications of the Wittig Reaction", and presents an effective historical survey of the use of the reaction in the synthesis of Vitamin A and the carotenoids; it is noteworthy that the industrial potential of the reaction was appreciated immediately, and a patent on its use for the synthesis of retinoic acid (by Wittig and H. Pommer, the latter one of the authors of this review) was published in 1954.

A chapter (45 pages, 231 refs.) on "Angle Strained Cycloalkanes", by A. Krebs and J. Wilke, presents a clear and concise account of another field in which Wittig made important contributions, mainly in the years 1960—1972. This survey, which covers concisely the synthesis, reactions, and physical properties of these interesting compounds, is especially well organized, and a model of its kind. Brief sections on silacycloalkynes, oligomerization by transition metal salts or complexes, and formation of complexes with transition metals will be of special interest to many readers of this journal.

The remaining chapter (20 pages, 30 refs.), by U. Schöllkopf, deals with "Enantioselective Synthesis of Nonproteinogenic Amino Acids", and is concerned largely with the author's own researches.

Prof. Wittig has been a valued member of the Editorial Board of the *Journal of Organometallic Chemistry* since its inception, and it is thus a special pleas-

ure to welcome in its pages this latest tribute to his great contributions to chemistry.

*School of Chemistry and Molecular Sciences,
University of Sussex, Brighton BN1 9QJ (Great Britain)*

COLIN EABORN

Carbanion Chemistry; by R.B. Bates and C.A. Ogle, Springer-Verlag, Berlin etc., 1983, viii + 117 pages, DM 48.

This slim monograph is Vol. 17 in the series "Reactivity and Structure, Concepts in Organic Chemistry".

The authors' stated intention was that "of collecting some of the multitudinous new literature on carbanions and presenting it along with the fundamentals of carbanion chemistry", and to this end about 400 references from the period 1976–1982 have been incorporated along with a rather similar number from earlier years. This compulsion to mention so many recent publications in so short an account leads to a treatment more akin to an Annual Report type of survey rather than to a rounded treatment one expects from a textbook, and in many places the text is mainly a source of references rather than of direct information; for example, the very important metal–halogen interchange method of forming organolithium compounds is dealt with in 18 lines of text and 7 equations with 15 references, and the style is nicely illustrated by the following passage which takes up 10 of the 18 lines on this subject: "Metal–halogen interchanges are used primarily to prepare organolithium compounds from alkyl and aryl halides; they often give better yields than reactions of the halides with metal due to less side reactions [133]. In general the rates decrease in the series $I > Br > Cl \gg F$. The reactions are equilibrium processes favouring the more stable carbanion [134]. They are performed at or below room temperature in hydrocarbon solvents or (more rapidly) in ethers [135]. Concerted mechanisms have been postulated due to the observed second order kinetics and salt effect [134]. CIDNP experiments on the reaction of alkylolithiums with alkyl and aryl halides indicate the presence of radical intermediates [136,137]."

Some points of detail I noticed are as follows: (a) Values for acidities of carbon acids are given only for DMSO solutions; no direct mention is made of the more comprehensive, and I suspect more generally useful, data available for cyclohexylamine solutions. (b) Amazingly the section on structures of non-delocalized carbanions gives no reference to Schleyer's fine work (and there is only meagre reference to his work elsewhere) and there is no mention of compounds with more than one metal at a single carbon centre. (c) The book is essentially about organic derivatives of Group IA and IIA metals, aluminium, zinc and cadmium rather than about carbanions as such (though carbanions with quaternary ammonium counter ions are referred to briefly); thus the topic of kinetic acidity of carbon acids is dismissed in a few lines with reference to a 1973 review, and there is no mention of the important kinetic studies by Kreevoy, Kresge, and Streitwieser among others, or of the studies of carbanions generated in MeOH by addition of NaOMe to suitable fluoro-