

## Book review

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*Silicon Reagents for Organic Synthesis*; by W.P. Weber. Springer-Verlag, Berlin - Heidelberg - New York, 1983, XVIII + 430 pages, DM 224.

The content of this book is accurately indicated by its title, except that reagents and procedures used for silylation at OH, SH and NH bonds are omitted, probably wisely, since these have been reviewed elsewhere, and, as the author states, their inclusion could easily have doubled the length of the volume. The scope and approach are best illustrated by the titles and lengths of the various chapters, which are as follows: fundamental considerations (5 pages, 39 refs.); chemistry of trimethylsilyl cyanide (15 pages, 78 refs.); trimethylsilyl iodide and bromide (19 pages, 84 refs.); silyl azides (14 pages, 56 refs.); silyl nitronates (4 pages, 9 refs.); Peterson reaction (21 pages, 93 refs.); vinyl silanes (35 pages, 143 refs.); aryl silanes (15 pages, 75 refs.); silyl acetylenes (30 pages, 117 refs.); tetraalkylsilanes, alkylpentafluorosilicates and alkenylpentafluorosilicates (14 pages, 65 refs.); allylic silanes (33 pages, 108 refs.); electrophilic reactions of silyl enol ethers (22 pages, 102 refs.); oxidation of silyl enol ethers (7 pages, 31 refs.); cyclopropanation of silyl enol ethers, chemistry of trimethylsilyloxy-cyclopropanes (8 pages, 28 refs.); cycloaddition and electrocyclic reactions of silyl enol ethers (22 pages, 43 refs.); preparation of silyl enol ethers (18 pages, 79 refs.); ionic hydrogenations (15 pages, 77 refs.); reduction of polar multiple bonds by hydrosilation (10 pages, 38 refs.); dissolving metal reductions (23 pages, 89 refs.); miscellaneous reductions (18 pages, 95 refs.); silicon-sulfur (19 pages, 76 refs.); silicon-phosphorous (sic) (20 pages, 75 refs.); silyl oxidants (5 pages, 23 refs.); silyl bases (8 pages, 30 refs.); silicon-fluorine (14 pages, 25 refs.).

In the chapter of the book on which I am best qualified to comment, that on arylsilanes, there are some defects. In particular, the account of aromatic nitrodesilylation overlooks the fact that the reactions described were shown some 11 years ago to involve nitrosodesilylation followed by oxidation (and, indeed, there is no evidence that direct nitrodesilylation has ever been observed); awareness of this would have greatly simplified the discussion. Again attribution of the greater ease of cleavage of aryl-SiMe<sub>3</sub> than of aryl-H bonds to the inductive effect of the Me<sub>3</sub>Si group was abandoned some 14 years ago. It would also, I think, have been wise to point out specifically that the cleavages of aryl-SiMe<sub>3</sub> bonds by electrophiles are subject to the same kinds of substituent effects as those of aryl-H bonds (though it could be argued that this should be evident to a reasonably well-informed organic chemist), and thus that, contrary to the impression given, the electrophile will not always displace SiMe<sub>3</sub> in preference to hydrogen. Two fairly extensive and directly relevant reviews, which would have served to counteract these defects, are unfortunately not mentioned.

My firm impression, however, is that the chapter I have criticized is not typical of the book as a whole, and that the volume presents a very large amount of accurate information (some 1700 references are cited) which will be of great

value to the organic chemist. The question must arise as to how this account compares with two other recent accounts of the same topic, viz. the book "Silicon in Organic Synthesis" by E. Colvin, and the chapter "Organosilicon Compounds in Organic Synthesis" by P.D. Magnus, T. Sarkar and S. Djuric, in *Comprehensive Organometallic Chemistry*. The fact is that the three accounts take somewhat different approaches, and to a large extent draw on different illustrative examples of syntheses, so that they are effectively complementary, and the organic chemist seeking to use organosilicon reagents would be advised to consult all three. I believe, however, that there is still a need for a more complete outline of organosilicon chemistry (as distinct from its specific applications) directed towards organic chemists.

The volume under review is well produced and pleasant to read. It has an author index, a good subject index, and an especially helpful table of contents. Its cost (equivalent to ca. U.S.\$87 or £56 at the time of this review) is about normal these days for a specialist book, though in view of the prospect of possible large sales among organic chemists a somewhat lower price might have been expected.

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

COLIN EABORN