

Buchbesprechung · Book Review

Topics in Current Chemistry, K. N. Houk, J. M. Lehn, S. V. Ley *et al.* (Eds.), Vol. 190, Peter Metz (Ed.), **Stereoselective Heterocyclic Synthesis II**, 1. Auflage, 194 S., 386 Abb., 16 Tab., Springer-Verlag, Berlin-Heidelberg-New-York-London-Paris-Tokyo-Hong Kong, 1997, Hardcover DM 168,-, ÖS 1.226,40, sFr 147,-, GBP 64,50, US \$ 109,-, ISBN 3-540-62700-6

The book deals with four areas of current interest and each chapter has been written by experts and workers active in the field. In the first and most detailed account (pp. 1–86) P. Chiu and M. Lautens describe the chemistry of functionalized 7-oxabicyclo[2.2.1]heptanes and of 8-oxabicyclo[3.2.1]oct-6-en-3-ones. After a survey of various cycloaddition procedures it is shown how the resulting oxabicycles can be modified structurally with considerable stereocontrol mainly due to the convex-concave principle and substrate control. Recent routes to enantiopure oxabicycles are outlined, including desymmetrization of *s*-symmetric bicyclics and also asymmetric hydrometallation of the strained olefinic double bond of the 5-membered dihydrofuran moiety. The resulting carbon-metal bond then serves as an Achilles heel for breaking the vicinal carbon-oxygen bond giving rise to 6- and 7-membered rings. In the [3.2.1] series a workhorse for exploring these strategies is the easily assembled 2 α ,4 α -dimethyl derivative (Encyclopedia of Reagents for Organic Synthesis, L. A. Paquette, Ed., Wiley, 1995, pp. 4591–4593). The chemistry in this area is not only methods oriented. A good deal has already gone through the purgatory of total synthesis (see also dicyoxetane: Chem. Eur. J. 1995, 1, 368–373; bryostatin C1-C-9 segment: Tetrahedron: Asymmetry 1997, 8, 3913–3920 and earlier papers. Thymine polyoxine C: Tetrahedron 1997, 53, 14417).

Chapter 2 by P. Perlmutter (pp 87–102) describes a stereoselective tandem process leading to 5- and 6-membered heterocycles. The sequence consists of a nucleophilic addition to

an aldehyde, ketone or aldimine in the first step and an electrophilic mediated attack of the resulting OH and NH functionality onto an olefinic double bond (“NARC”). A highlight here is the Tachibana total synthesis of the KLM segment of the ciguatoxins.

Chapter 3 by A. W. M. Lee and W. H. Chen (pp. 87–102) deals with chiral acetylenic sulfoxides, vinyl sulfoxides, acetylenic sulfinate and sulfonates as well as α,β -unsaturated propane sultone (prop-1-ene). The preparation of these α,β -unsaturated building blocks is described and applications in stereoselective Diels–Alder cycloadditions, heterocyclic and alkaloid syntheses are outlined. A strategy here is to use the activated carbon-carbon double bond as a Michael acceptor for an amine in *exo*-trigonal cyclizations. Another ploy is to generate from an activated triple bond and an amine, after tautomerism, an iminium ion which enters into a Friedel–Crafts type cyclization with electron-rich aromatic systems. Tricyclic and pentacyclic alkaloids with the β -carboline and yohimbine skeleton have been prepared.

In the final chapter (pp. 132–181) Weinreb reports on the synthesis and reactions of *N*-sulfonyl imines. Recent methods for preparing and handling these electron-deficient imines are outlined. These imines complement reactions of the more familiar *N*-acylimines which have found widespread use in synthesis. Nucleophiles that have been added to the activated carbon-nitrogen bond include cyanide ion, carbanions, alkenes, vinylsilanes, allylsilanes, hydrides and organometallics. Finally pericyclic reactions including ene reactions are outlined.

In summary, the book surveys selected developments in four different areas. Although the chapters differ very much in length and amount of material presented they all are useful starting points for further research and manage to transmit some of the current thinking and activities of organic chemistry.

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