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Science of Synthesis, Volume 40b: Amine N-Oxides, Haloamines, Hydroxylamines and Sulfur Analogues, and Hydrazines, edited by D. Enders and E. Schaumann, Georg Thieme Verlag: Stuttgart, **2008**, hardcover, 532 pp., US\$ 3600, ISBN 978-1-60406-218-2 (Americas)/€ 2590, ISBN 978-3-13-146251-0 (EUR, Asia, Africa, AUS)

The field of organic synthesis has grown tremendously over the past decades. Due to the large number of compound classes and numerous synthetic procedures the individual methods cannot be surveyed any more by a single person. In order to cover the constantly increasing primary literature and to keep track of the development in this area, a large number of review articles, reference series, and electronic databases is available. It often appears difficult to find the most promising synthetic approach by exclusive use of databases. *Science of Synthesis* in succession to *Houben–Weyl Methods of Molecular Transformations* occupies a central place among these referencing tools and fills the gap between review articles, reference series, and electronic databases.

The Volumes 40a and 40b are dealing with aliphatic amines and derivatives including 13 product classes. Table 1 in the introduction comprises the compounds covered by both volumes. Product class 1 ‘amino compounds’ occupies the whole Volume 40a, thus covering about two thirds of the content. This product class is divided into seven product subclasses: alkyl- and cycloalkylamines, propargylic amines, allylic amines, n-nitrogen- or n-phosphorus-functionalized alkylamines ($n \geq 2$), aziridines, azetidines, and ammonium compounds and nitrogen ylides. Except product subclass 2 (propargylic amines), all product subclasses are introduced to the reader by a general introduction. The different procedures for the synthesis of this subclass are described in five chapters: synthesis by reduction, substitution, addition reactions, rearrangement, and synthesis from other amino compounds. The other six product subclasses of Volume 40a are smaller and do not need further subdivision according to the synthetic procedures.

Volume 40b covers the remaining twelve product classes: nitroxyl radicals (nitroxides), amine N-oxides, N-haloamines, hydroxylamines, 1-oxa-2-azacycloalkanes, hydrazines and hydrazinium salts, 1,2-diazacycloalkanes, triazanes and tetrazanes, amido derivatives of sulfanediol, amido derivatives of sulfuric acid, N-alkylsulfamic acids and derivatives, and ammoniumsulfonates, thiohydroxylamines, and aminosulfonium salts.

The major body of the text consists of synthetic procedures for the compounds of the individual product classes. The synthetic methods do not only cover recent work (in some cases up to 2008), but also older literature including procedures from the predecessor *Houben–Weyl*. Depending on the

applicability of a method, synthetic procedures are given for individual compounds, as typical procedures describing only one example or as general procedures useful for a series of substrates (given in a table). General procedures represented by a long table are especially useful, as they often combine examples from different sources and thus make them comparable. The synthetic procedures provide all information required for reproduction, including typical analytical data (mp, $[\alpha]_D$, and in a few cases IR and ^1H NMR data).

Of course, a giant text of this scale does contain some errors and flaws. For example, in the product of the aza-Baylis–Hillman reaction (p. 14, Table 3) a double bond is missing. Scheme 18 (p. 129) does not show a stereoselective reduction as mentioned in the text. The headline of chapter 40.1.1.2.2 (p. 203) should have been ‘nucleophilic substitution of carbon functionalities’, as in most cases the nucleophile is not the solvent. On p. 420, the (*R*)-enantiomer of compound **10** is shown, but (*S*)-**10** is used in the table. On p. 435 (chapter 40.1.1.5.2) the Mannich reaction and exclusively modern (enantioselective and organocatalytic) procedures of the Mannich reaction are discussed, but classical procedures for Mannich reactions as well as their appropriate references are missing. The text describing the mechanism shown in Scheme 61 (p. 671) should be modified for the last two steps: the addition to the imine is not an $\text{S}_{\text{N}}2'$ attack (also true for the text corresponding to Scheme 65 on p. 673) and the final step is not a Michael addition but a usual $\text{S}_{\text{N}}2$ reaction. The headline of Table 10 on p. 790 is wrong: following the classification used in the Baldwin rules (*J. Chem. Soc., Chem. Commun.* **1976**, 734), these cyclizations are 4-*exo-tet* and not 4-*exo-trig* ring closures. On p. 1255 in the line below Scheme 5, it should say heterodiaziridines instead of heteradiaziridines. The present volumes should cover alkylamines, whereas arylamines are covered in Volume 31b [Arene–X (X = N, P)], section 31.28. Although, some overlap between the different volumes appears to be desirable, at some places in the present volumes exclusively arylamine derivatives have been described, see for example product subclass 5 on pp. 1278–1279. However, these few minor mistakes do not at all diminish the highly positive overall impression of the *Science of Synthesis* Volumes 40a and 40b.

In conclusion, the present Volumes 40a and 40b do not only represent an integral part of the whole *Science of Synthesis* series but are certainly also of interest as separate reference books for synthetic procedures to alkylamines and derivatives. The excellent and uniform layout found in the whole series has been also applied to these volumes. By their exhaustive coverage of synthetic methods combined with a well-balanced content, up-to-date literature coverage, and a highly logical principle of organization, these volumes become an indispensable tool for synthetic organic chemists in academics and industry. In short, tell your librarian: highly recommended!

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