

Stereochemie in der Organischen Synthese. By H.-D. Scharf, H. Buschmann. Rolf Bünte: Aachen, 2001, € 61.36, paperback; ISBN 3-89811-518-6, 1043 pp (2 Volumes).

Stereochemistry is one of the highly important topics in Organic Chemistry and the present book is a great contribution to discussion and education in stereochemistry—great in intention and in performance. The book is written from a modern point of view and should stimulate both scientists and students. For extensive information in theory and practice the authors give more than 5000 references including actual guide books, monographs, and papers. Some parts have the character of a review and have less text than references other parts are very similar to scientific essays.

The book is divided in two volumes with eight chapters. The first chapter is a discussion about chemistry as a basic science beginning with a philosophic contemplation, giving strategies, experiences and new aspects and concluding with the final question—*quo vadis?*

Chapter two contains a short introduction into symmetry elements and symmetry operations. The discussion of different point groups is facilitated due to the illustration of exemplary molecules, but the relationship between symmetry and chirality is found in chapter three, in which the phenomenon of chirality is treated. As expected, this chapter is the first principal point of the book and contains a very detailed and informative discussion about chirality and biological effects. Included, is a discussion on stereodescriptors and the classification of chirality is interestingly illustrated and explained with great competence. Certainly, the Cahn-Ingold-Prelog convention has used before without an explanation in connection with biological effects.

Chapter four is one of the shortest and is entitled “Selectivity” and shows the strong orientation of the book towards dynamic problems in stereochemistry. Stereoselectivity is a fundamental demand in modern asymmetric synthesis. A little more detailed discussion could be expected on the ambiguous distinction of stereoselectivity and stereospecificity. Very valuable is the approach to explain selectivity on the basis of the Eyring-equation. The classification of selectivity is illustrated with excellent examples, e.g. the Paterno-Büchi reaction, one of the working fields of the authors. Models and hypotheses in stereochemistry are treated in chapter five. This chapter is great in volume and content. To stimulate the reader there is a quotation by Horst Pracejus, one of the pioneers in the application of physical methods to stereoselective processes. With more or less completeness different models developed by Prelog, Cram, Karabatsos,

Felkin-Anh, Helmchen-Schmierer, Ugi-Ruch, and Salem are analyzed in an interesting and attractive manner. The Arrhenius and Eyring equations are treated as a basis for Linear Free Energy Relationships (LFER). All considerations about kinetic selectivity principles aim at the derivation of the “isoinversion principle” which was developed by the authors. Everybody who is interested in new stereochemical ideas should read this excellent review with more than fifty examples from classical and current literature. In comparison to this the treatment of the Curtin-Hammett principle, the Winstein-Holness equation and the Baldwin rules is more concise but also correct and worthy of reading.

Chapters six and seven have a practical orientation and show that modern stereochemistry is connected with the preparation and handling of substances. Obviously, the introduction is a little surprising: after seven pages of text, seventeen pages of references follow. The reviewer missed under “classical” works the early book by Klambunowski. On page 566, legend of Abb. 6.23 it is not clear what are “chirale physikalische Kräfte”? After the discussion of nonlinear effects, chiral amplification, and autocatalysis, the concept of double stereodifferentiation and absolute asymmetric synthesis 25 pages of tables follow with chiral molecules in synthesis as building blocks or auxiliaries. Everybody who is working in the field of asymmetric synthesis will realize this collection is very valuable.

Chapter seven is entitled “Preparation of Enantiomerically Pure Substances” and is illustrated by successful procedures of chiral auxiliaries checked in the authors laboratory. Real and valuable auxiliary methods developed by Enders, Hoppe, Hoffmann, Kunz, and Braun are discussed in detail. This chapter will open the way to chiral compounds, which are easily prepared. The last part of the book (chapter eight) is a stereochemical glossary including 175 pages of text and 461 pages of references, actually, a book within a book and useful for both scientists and students. It is a pleasure to compare and to repeat stereochemical notions and concepts given here.

The book is written very conveniently in a two-column system with short abstracts and hints in the smaller column. For a fast orientation a detailed register exist, but the reader should refer to the glossary.

The book is a legacy of Hans-Dieter Scharf, who was an outstanding scientist and teacher in Aachen. We feel admiration for him because he wrote this work in his last years together with his coworker Helmut Buschmann. It is written in German and should be translated into English to introduce a broader readership to the value of this book. On this occasion some errors in the text and within the references should be corrected. The book is big and is presented in two volumes, which are available only together.

The publishing as “book on demand” (www.libri.de) results in its availability at a reasonable price and should be destined for revision and updating.

I really wish the book a great success and a high acceptance.

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