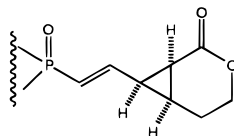


Additions and Corrections

Asymmetric Synthesis of Enantiomerically Pure and Diversely Functionalized Cyclopropanes [*J. Am. Chem. Soc.* **1995**, *117*, 10393–10394]. STEPHEN HANESSIAN,* DANIELE ANDREOTTI, AND ARTHUR GOMTSYAN

Page 10394: The structure of the adduct in entry 4 Table 1 (compound **10**) should be:



JA955040V

Book Reviews

Comprehensive Organometallic Chemistry II, 14 Volume Set. Edited by E. W. Abel (University of Exter, U.K.), F. G. A. Stone (Baylor University), and G. Wilkinson (Imperial College of Science Technology and Medicine, U.K.). Elsevier: Oxford. 1995. 9000 pp. \$4,470.00. ISBN 0-08-0406084.

In 1982, the three editors-in-chief of the volumes under review here brought into existence the predecessor opus, *Comprehensive Organometallic Chemistry* (COC). In this earlier series, the subject was covered from its headwaters in the early nineteenth century (Zeise's salt, diethylzinc, Grignard reagents) to the great flowing river it had become by the end of 1981. These volumes were of the highest quality in every way—comprehensive, accurate, and authoritative—and they were immensely useful.

Since 1982, organometallic chemistry has continued to grow, both in sheer volume and in importance, at an astonishing rate. Thus, the same three editors-in-chief decided that it would be appropriate to provide an updated coverage dealing with the years 1982–1994. And here it is, COC-II, in print before the end of 1995—a remarkable accomplishment in itself.

The strategy adopted was to regard the original work in nine volumes as a part of the entire corpus and to supplement the material therein with a review of all the new material that has appeared in the literature subsequently. This approach was adopted in preference to trying to revise and update the original work in a way that would produce a new one with stand-alone character. I think the editors-in-chief made a wise and practical decision. I hope that the publisher will see to it that the original opus remains available to those who purchase this one and then see the need to have the first one as well.

I think COC-II merits a “rave” review and that is what I am going to give it. It is just a superb work in every respect. Needless to say, I cannot assure the reader that it is without omissions throughout. All I can say is that wherever I have looked at the coverage of an area I know well, I have found it to be complete to the best of my recollection. Moreover, since there are lots of individual authors, each of whom is a specialist, the tone and emphasis are balanced and correct. In addition to the bare facts, one gets overviews, generalizations, and perspective.

The format and physical quality of these volumes is at the highest possible level. All important compounds are depicted with structural drawings that are clear and ready to hand. All statements and assertions are referenced to the original literature. The books themselves are handsomely produced on quality paper with rugged bindings.

There is a very useful formula and subject index, although the metal-by-metal organization of the material is such that one could probably find most things without the index. There is also an enormous (1282 pages) Structure Index, which allows one to find the literature references for all published structures of organometallic compounds during the period in question. It is here that I have to express my only (mildly) negative comment. There exists a computer accessible database that covers, inter alia, all of these compounds, namely, the Cambridge Crystallographic Data Centre, and I would guess that every research-

active chemistry department and chemical research laboratory has it. Moreover, it gives a lot of information as well as the literature references. The hardcover printed Structure Index is an anachronism. While it might, at times, be convenient to have it, it constitutes 14% of total COC-II and thus, presumably, adds significantly to the price.

This new COC-II is an absolute must for all libraries and even, despite the price, a reasonable purchase for an individual research group of medium size. Any researcher in the field of organometallic chemistry without ready access to it will be seriously handicapped. The editors-in-chief, the volume editors, and all of the authors have done a terrific job and deserve thanks and congratulations.

F. A. Cotton, Texas A&M University

JA955369G

Stereoselective Synthesis, Volume E21b. Edited by Gunter Helmchen (Heidelberg), Reinhard W. Hoffmann (Marburg), Johann Mulzer (Berlin), and Ernst Schaumann (Clausthal). Georg Thieme Verlag: Stuttgart, Germany. 1995. 1068 pp. DM2,840.00. ISBN 3-13-797904-8.

The second volume in the Houben–Weyl set for *Stereoselective Synthesis* is devoted to the formation of C–C bonds by addition to carbonyl groups and to imino groups as well as by reactions involving olefinic double bonds. Twenty-four authors have contributed the more than 1050 pages that constitute this volume. As in the previous and subsequent volumes, example procedures for typical methodologies are provided.

Volume E21b begins with a basic review of theoretical models for addition to carbonyl compounds and proceeds to describe various reagents and substrates for addition. The “tricks-of-the-trade” are well documented as, for example, precomplexation of a cyclic ketone with methylaluminum bis(2,6-di-*tert*-butyl-4-methylphenoxide) (MAD) to achieve high axial selectivity in addition reactions with organolithium and Grignard reagents. There are extensive tables that list reactants, products, diastereomeric ratios or enantiomeric excesses, yields, and literature references.

In addition to classical studies, the addition transformations documented in this volume include the uses of chiral auxiliaries, chiral reagents, and chiral catalysts, including enzymes. Applications of allylboron, allylsilane, allylstannane, and various other allylmetal reagents are described, and methods for their preparation are given. Subjects such as 1,3-chirality transfer, vinylogous substitution reactions, substrate-induced diastereoselection, and reagent-induced enantioselection testify to the breadth of topical completeness. References to the literature into 1993 are included in this volume.

The treatment of carbonyl addition reactions is comprehensive with section divisions according to substrate and reagent, among others; organometallic and enzymatic methods are well represented. Additions to imino groups are organized according to individual substrate classes

(e.g., imines, hydrazones, oxime ethers, nitrones) and also by nucleophilic reactant. The section on reactions involving olefinic double bonds is devoted to vinylogous substitution (S_N2') reactions and, mainly, to conjugate addition of nucleophiles to α,β -unsaturated substrates.

Individual sections distinguish between intermolecular and intramolecular processes, and reactions of cyclic and acyclic substrates are often treated separately. Mechanistic information relevant to stereocontrol is provided and enhances the potential for subsequent applications. In general, the treatment that is given to individual transformations is critical rather than merely a report of literature results. Volume E21b of *Stereoselective Synthesis* provides the finest compilation of information available on stereoselective additions to carbonyl compounds and imino groups and those reactions involving olefinic double bonds.

Michael P. Doyle, *Trinity University*

JA9553258

Stereoselective Synthesis, Volume E21a. Edited by Gunter Helmchen (Heidelberg), Reinhard W. Hoffmann (Marburg), Johann Mulzer (Berlin), and Ernst Schaumann (Clausthal). Georg Thieme Verlag: Stuttgart, Germany. 1995. 1150 pp. DM2,600.00. ISBN 3-13-797904-8.

The long-awaited Houben–Weyl set of five volumes and appendix/indices on “stereoselective synthesis” in the *Methods of Organic Chemistry* series has now been published following delays for transition from German to English. This set has been created to give a comprehensive treatment of chemical transformations in which a new stereocenter is created, including enantio- and diastereoselective reactions. Syntheses whose component transformations do not lead to new stereogenic units are not included (e.g., S_N2 reactions, syntheses from the “chiral pool” that do not generate a new stereogenic unit, and E/Z selective formation of alkenes). Literature references for individual sections extend into 1991.

Volume E21a provides a general treatment of stereochemistry, including basic principles, nomenclature, and vocabulary (G. Helmchen), an overview of the synthesis of enantiomerically pure compounds that describes basic principles and options (J. Mulzer), and methods for the determination of enantiomeric purity (V. Schurig, W. Lindner, and G. Uray) as well as those for absolute and relative configuration (H. Duddeck, G. Maas, P. Welzel, and J. Gawronski). The synthesis

of axially chiral compounds (allenes and biaryls) is a special section (C. J. Elsevier, G. Bringmann, R. Walter, and R. Weirich) to this volume, as is that for the synthesis of chiral compounds by bond disconnection, including deprotonation, elimination reactions, ring opening, and enzymatic methods (H.-J. Gais). Twenty-five authors have written the more than 1100 pages that constitute this volume. The analytical sections are comprehensive and invaluable.

The heart of *Stereoselective Synthesis* is transformations based on bond formation for the synthesis of chiral compounds, and Volume E21a begins this process with the formation of carbon–carbon bonds. Included in this 500-page section are alkylation of organometallic compounds (H. Ahlbrecht), enolates (T. Norin, G. Frater, H.-E. Högberg, J. S. McCallum, and L. S. Liebeskind), azaenolates (P. Fey), dihydropyrazines (W. Hartwig), metalated sulfoxides (G. Solladié), and α -haloalkyl boronic esters (D. S. Matteson), as well as sections on alkylation with reagents containing chiral leaving groups (P. Duhamel), alkylation using chiral additives (J. M. Brown), and C-H insertion reactions (D. F. Taber). Although these sections reflect the individual preferences of the authors, the vast majority are comprehensive and provide key acknowledgments for critical developments in the C–C bond forming reactions. Characteristic of the *Methods of Organic Chemistry* series, example procedures are given that allow this volume series to be used as a direct laboratory resource.

In contrast to the recent Eliel/Wilenski book *Stereochemistry of Organic Compounds*, which focuses on organic compounds, the introductory sections of *Stereoselective Synthesis* focus on organic chemical processes. The reactant-based Izumi–Tai and Seebach–Prelog systems are described and provide a guide for understanding and discussing stereoselective and stereodifferentiating reactions. Among the terms not recommended for use are diastereomeric excess, geometric isomers, optical isomers, prochiral, and scalemic. Other features also distinguish the complementarity of the two volumes in their descriptions of stereochemistry.

If there would be criticism of this volume or the series, it is in the convenience of access to the wealth of information that is contained. The table of contents is difficult to follow, and the index is the sixth volume. However, overall Volume E21a of *Stereoselective Synthesis* is a scholarly contribution of sufficient magnitude to be an essential reference for anyone performing stereoselective syntheses.

Michael P. Doyle, *Trinity University*

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