J|A|C|S
BOOK REVIEWS

Organic Reactions, Volume 73. Editor-in-Chief: Scott E. Denmark (University of Illinois at Urbana-Champaign). John Wiley and Sons, Inc.: Hoboken, NJ. 2009. x + 608 pp. $140. ISBN 978-0-470-43690-5.

"Allylboration of Carbonyl Compounds" written by Lachance and Hall is the latest topic in the *Organic Reactions* series. The authors extensively cover the allylboration of aldehydes and ketones using diverse allylboron reagents, including allenylboron and crotylboron reagents. The chapter is well organized with regard to reagent and reaction type, mechanism, reagent synthesis and scope, and applications in natural product synthesis. It also includes a very nice review of the factors involved in determining stereoselectivity in reactions with chiral aldehydes and chiral allylboron reagents. A number of natural product syntheses, mostly polyoxygenated compounds, in which these reagents were used are covered. It is striking how many clever applications of the allylation adducts with installed functional groups, e.g., silanes, borons, alkenes, there are.

A very balanced analysis of the strengths and weaknesses of each reagent is provided, and good experimental details for commonly used reagents and some newer catalytic protocols are given. The scope and limitations of each reagent and reaction are noted. In particular, the chapter covers the reactivity concepts that should serve in the judicious application as well as extension of the methodologies.

Of note, the authors discuss the recent use of asymmetric catalysis in the synthesis of the chiral allylboron reagents as well as the catalysis of allylboration with achiral allylboron reagents. This is a rapidly moving field, and already there are journal articles that have since appeared that report improved levels of asymmetric induction.

The chapter concludes with an extensive tabular section that includes all allylboration reactions of aldehydes and ketones through 2005. This section is extensive and organized but almost too large; an electronic database search, which is updated regularly, will ultimately be more useful and faster than scanning this section, which will soon be outdated.

Reading this chapter gives the organic chemist an opportunity to learn a number of cutting-edge reactions, e.g., catalytic and asymmetric ones, and the creative ways that allylboration has been applied in organic synthesis. Allylboron chemistry, and allylation chemistry in general, is remarkably versatile with respect to the synthesis and application of the allylation reagents.

This is generally a well-written review of the allylboration reaction but at times does not stray far enough from existing reviews on the topic to cover the latest contributions. For example, although it is mentioned early on that imines can also be substrates, no examples are given. This is a very interesting and new substrate class, and it was disappointing that these reactions, some of which are catalytic and asymmetric, were not covered. Additionally, few uses of this reaction for the synthesis of nitrogen heterocycles were included. All of the applications cited appear to originate from academic laboratories, and it was not addressed if any of the methods have found use in industry, medicinal chemistry, or studies of structure−activity relationships. Some such examples do exist, and they would have added some real-life utility to the field. The authors might also have provided further direction on where the field needs to go to achieve greater industrial utility.

Overall this book is a very useful addition to an organic chemist's library and is written for both the student and the expert in the field. It will be especially helpful to those who wish to use the allylboration reaction in a synthesis as well as to those interested in furthering the field of allylboration chemistry. It should also interest both organic synthesis strategists and more mechanistically inclined readers, especially those fascinated by asymmetric induction.

Sherry R. Chemler, *The University at Buffalo, The State University of New York*

JA906882Y

10.1021/ja906882y

10.1021/ja906882y CCC: $40.75