

PREFACE TO VOLUME 88

The Prefaces to Volumes 78 and 85 highlighted the importance of nitrogen and nitrogen-containing compounds in the biosphere and the “chemosphere”. It is impossible to overstate the enormous diversity of organonitrogen substances as well as their critical role as agrochemicals, pharmaceuticals, and high-performance polymers. Nitrogen is so central to chemistry and life that it has also inspired writers and poets such as Sam Kean (*The Disappearing Spoon*) and Mario Markus (*Chemical Poems: One for Each Element*). However, no writer has matched the great Primo Levi in his ability to capture and express the personality and unique character of the elements as found in his classic compendium, *The Periodic Table*. In the chapter dedicated to Nitrogen, Levi observes:

“Nitrogen is nitrogen, it passes miraculously from the air into plants, from these into animals, and from animals to us; when its function in our body is exhausted, we eliminate it, but it still remains nitrogen, aseptic, innocent. We — I mean to say we mammals — who in general do have problems about obtaining water, have learned to wedge it into the urea molecule, which is soluble in water; and as urea we free ourselves of it; other animals, for whom water is precious, have made the ingenious invention of packaging their nitrogen in the form of uric acid, which is insoluble in water; and of eliminating it as a solid with no necessity of having recourse to water as a vehicle”.

Whereas the chapter that comprised Volume 85 concerned itself with the introduction of nitrogen into aromatic substances through the agency of copper-mediated cross-coupling reactions, the chapter in this volume focuses on the introduction of nitrogen into aliphatic substances, both cyclic and acyclic. Although many such methods have been in use for decades, such as nucleophilic displacement with amines, azides, and nitrites, the most atom-economical method involves the addition of an N–H bond across an unsaturated linkage (alkene, alkyne, allene, diene, etc.). This construct has been the subject of intense investigation only in the past two decades, with a staggering increase in the past ten years. Indeed, the ability to create organonitrogen compounds from alkenes and ammonia may become the modern day equivalent of the Haber-Bosch process which revolutionized agriculture (and unfortunately also warfare).

The success of the research efforts over the past 20 years forms the basis for the single chapter in this volume namely, Hydroamination of Alkenes by Alexander L. Reznichenko and Kai C. Hultsch. The Board of Editors was hesitant to commission a chapter of this magnitude, but the importance of the chemistry motivated the search for authors with expertise and commitment to undertake such a massive effort. Our hopes could not have been better rewarded. The authors, Drs. Reznichenko and

Hultzsich, have compiled an enormous (and growing) literature and distilled it into an extraordinarily useful treatise on all aspects of the hydroamination process. Given the myriad types of unsaturated substrates, metal-based catalysts, and reaction conditions, the authors have done an outstanding job of identifying the best options for various permutations of amine type and alkene structure. This comprehensive treatment of so many different options constitutes a dream “field guide” for the perplexed chemist who wants to know how best to approach the formation of a C-N bond in a target structure to form new stereogenic centers as well as rings of various sizes. Much of the focus in recent years has been on the development of chiral ligand sets for various metals to effect enantioselective hydroaminations. The authors have compiled the state of the art in this field in a scholarly, separate section.

The Tabular Survey is logically organized by substrate structure and further subdivided by inter- and intramolecular reactions as well as enantioselective reactions. This highly user-friendly structure assures the reader to be able to locate relevant precedent with ease. Given the magnitude of this undertaking, the authors had to establish the literature coverage at the outset of the project, January 2011. However, they have provided a supplemental reference list that includes all reports appearing between February 2011 and April 2015.

Volume 88 represents the tenth single-chapter-volume produced in our 73-year history. Such single-chapter volumes represent definitive treatises on extremely important chemical transformations. The organic chemistry community owes an enormous debt of gratitude to the authors of such chapters for the generous contribution of their time, effort, and insights on reactions that we clearly value.

It is appropriate here to acknowledge the expert assistance of the entire editorial board, in particular, André Charette who shepherded this massive chapter to completion. The contributions of the authors, editors, and the publisher were expertly coordinated by the responsible secretaries, Robert Coates and Jeffery Press. In addition, the *Organic Reactions* enterprise could not maintain the quality of production without the dedicated efforts of its editorial staff, Dr. Linda S. Press, Dr. Danielle Soenen, and Dr. Dena Lindsay. Insofar as the essence of *Organic Reactions* chapters resides in the massive tables of examples, the authors' and editorial coordinators' painstaking efforts are highly prized.

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