

PREFACE TO VOLUME 94

“If we take into account the close relationship between carboxylic acids and nitronic acids, we shall come to the following comparison of the corresponding C and N compounds. The designation “nitrone” for the compounds of the type $R^1R^2=N=O$ becomes readily comprehensible..”

P. Pfeiffer, *Annalen* **1916**, 411, 72

The 76-year history of the *Organic Reactions* series serves not only as a treasure trove of knowledge but also as a chronicle of the progress of synthetic organic chemistry. In our current state of oversaturation and obsession with the latest report or incremental advance, we become immune to the realization of how much progress has been made in such a short period of time. Casual perusal of the more than 200 chapters in the series reveals the incredible structure of vertical science, a perspective difficult to perceive in a culture wherein “scholarly” outlets compete for immediate attention.

One of the most compelling illustrations of the progress of this discipline can be seen in the evolution of various reactions that have been documented several times in our history. Compare for example the chapter on the “Aldol Condensation” in Volume 16 (1968) with that on “Catalytic, Enantioselective Aldol Reactions” in Volume 67 (2006) or even more dramatically, the chapter on the “Schmidt Reaction” in Volume 3 (1946) and the update by the same name in Volume 78 (2012). Reading these chapters provides a welcome calibration on the health and power of synthesis and also invites the unavoidable question, “quo vadis” what will chemists be able to accomplish 50 years hence?

The single chapter in Volume 94 provides another such landmark, and one that is all the more remarkable because it provides an update on an even more recent chapter than those mentioned above. The combination of Rolf Huisgen’s early studies on reactions of dipoles, along with the brilliant insights of Woodward and Hoffmann on the foundational theory of pericyclic reactions, has led to a universe of powerful transformations belonging to the family of dipolar cycloadditions. One of the most synthetically useful members of this family is the [3+2] cycloaddition of nitrones which was the topic of a definitive chapter in Volume 36 (1988) authored by Pat Con-falone and Edward Huie. Now, nearly 30 years later, this reaction has grown to be so valuable in organic synthesis that a similarly comprehensive treatment has become impossible. Nevertheless, we are extremely fortunate that one of the world’s leading experts in this reaction, Professor Alberto Brandi and his team at the University of Florence (in the charmingly named “Dipartimento Ugo Schiff”) agreed to compose an update focused solely on the reactions of cyclic nitrones with alkenes. Even with this limited scope, this chapter constitutes the entire contents of Volume 94.

“[3+2] Dipolar Cycloadditions of Cyclic Nitrones with Alkenes” by Alberto Brandi, Francesca Cardona, Stefano Cicchi, Franca M. Cordero, and Andrea Goti is a masterful treatment of both the inter- and intramolecular variants of this tremendously important reaction. The chapter is systematically organized by ring size of the nitron in the intermolecular manifold and then again by tether length in the intramolecular manifold. The critical features of regioselectivity and stereoselectivity characteristic of all cycloaddition reactions are expertly presented such that readers can understand the key controlling components and are thus well positioned to design synthetic sequences with predictable outcomes. Of course, the product isoxazolidines are rarely found in target structures, so the authors have described the most common unmasking strategies to reveal the 1,3-amino alcohol subunit in a wide range of structural settings. Not surprisingly, a reaction capable of increasing molecular complexity with predictable regio- and stereoselectivity has found widespread application in synthetic endeavors, and the authors provide many illustrations that are bound to inspire readers to employ this useful technology. Finally, as is characteristic of organic reactions developed in the past 30 years, the [3+2] cycloaddition is susceptible to catalysis, and the most recent advances in this aspect are thoroughly treated as well. The Tabular Survey comprises 13 tables organized by both nitron ring size and then connecting tether length to allow readers to easily identify the kinds of precursor structure that could be employed in their own synthetic programs.

Volume 94 represents the fifteenth single chapter volume to be produced in our 76-year history (eighth in the past fifteen volumes!). 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. The completion of this chapter in just over four years after being commissioned is fitting testimony to the dedication and efforts of this highly talented and motivated Italian team.

It is appropriate here to acknowledge the expert assistance of the entire editorial board, in particular Steven Weinreb who shepherded this chapter to completion. The contributions of the author, editors, and the publisher were expertly coordinated by the board secretary, Robert M. Coates. In addition, the *Organic Reactions* enterprise could not maintain the quality of production without the dedicated efforts of its editorial staff, Dr. Danielle Soenen, Dr. Jeffery Press, Dr. Linda S. Press, Dr. Dena Lindsey, and Dr. Landy Blasdel. 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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