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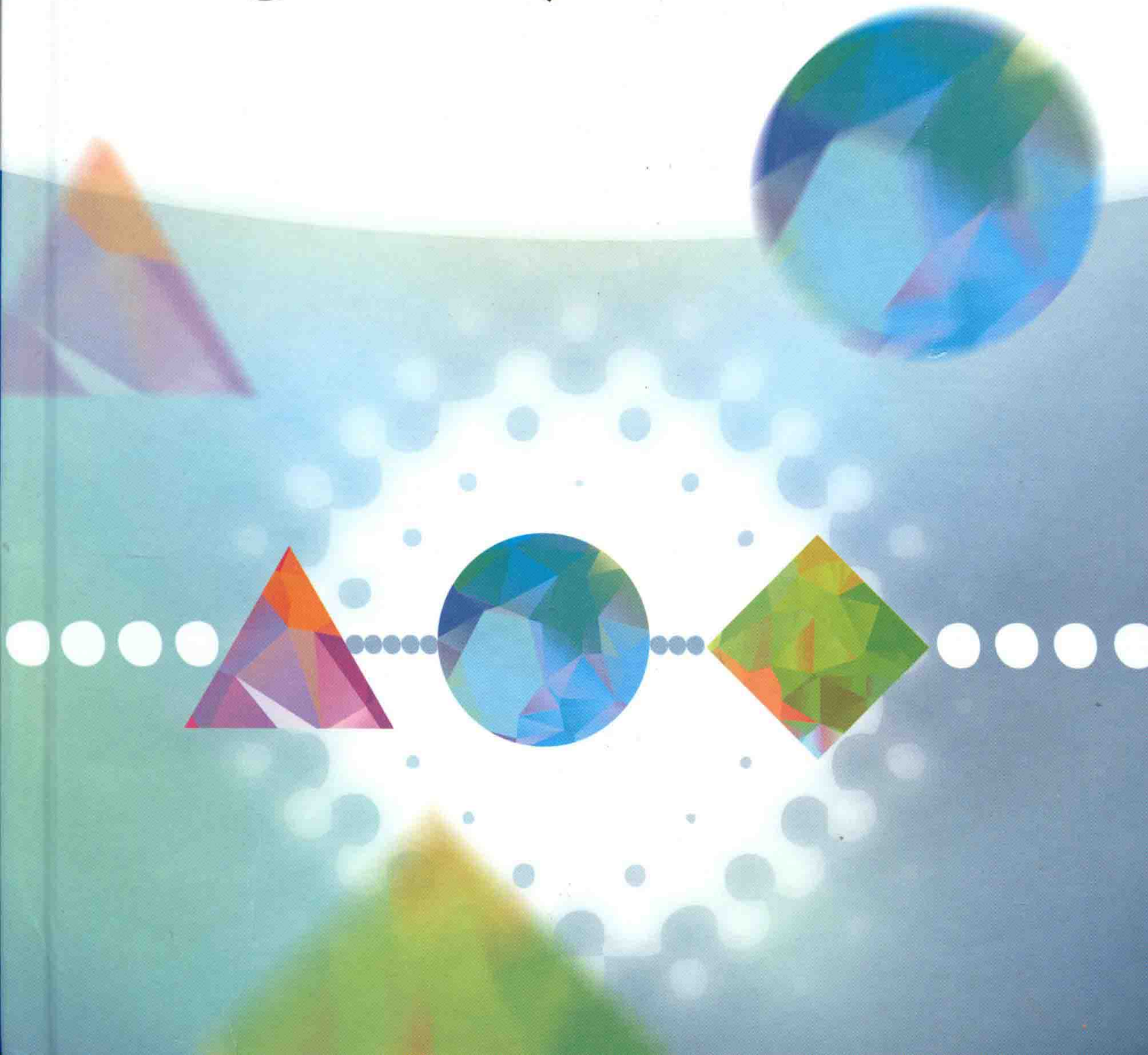
Jieping Zhu, Qian Wang, and Mei-Xiang Wang

# Multicomponent Reactions in Organic Synthesis



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# Multicomponent Reactions in Organic Synthesis



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# Preface

The quote by Aristotle "the whole is greater than the sum of its parts" nicely reflects the power of multicomponent reactions (MCRs) in which three or more reactants are combined in a single operation to produce adducts that incorporate substantial portions of all the components. Indeed, the ability of MCRs to create value-added molecules from simple building blocks is now well appreciated.

The Wiley-VCH book entitled "Multicomponent Reactions" published in 2005 was warmly received by research communities in academia and industry alike. As predicted in the preface of the very first monograph on the subject, extensive research on the development of new MCRs and their applications in the synthesis of natural products as well as designed bioactive molecules have been continuing at an explosive pace. Nowadays, there is hardly a chemical journal in the broad area of organic chemistry that does not contain papers related to multicomponent reactions. In light of the recent tremendous advances in the field, it became clear to us that a follow-up of this book is needed. While planning the contents of this book, we tried to focus on the synthesis aspects and to make the book complementary rather than an update to the first edition.

The book starts with a general introduction to MCRs (Chapter 1) followed by a detailed discussion on the many facets of discovering novel MCRs (Chapter 2). Inherent to the nature of the reaction, the MCR employs generally at least one substrate with multireactive centers. We therefore classified the MCRs according to the key substrate used, including arynes (Chapter 3), isonitriles (Chapter 4), 1,3-dicarbonyls (Chapter 5), heterocycles (Chapter 6), diazoacetate (Chapter 7), allenes (Chapter 11), alkynes (Chapter 12), and anhydrides (Chapter 13). In a more broad sense, metal-catalyzed (Chapter 8), radical-based (Chapter 14), oxidative (Chapter 10), and enantioselective (Chapter 15) MCRs and synthesis of macrocycles by MCRs (Chapter 9) are subjects of other five chapters. The authors of 15 chapters who outline the essence of the each subject and provide valuable perspectives of the field are all world leaders. It is interesting to point out that some of these subjects were virtually unexplored before 2005, the year the first book was published.

The present monograph, in combination with "Multicomponent Reactions (2005)," is intended to provide an essential reference source for most of the important topics of the field and to provide an efficient entry point to the key literature and background knowledge for those who plan to be involved in MCRs. We hope that the book will be of value to chemists at all levels in both academic and industrial laboratories. Finally, we hope that this monograph will stimulate the further development and application of this exciting research field.

We would like to express our profound gratitude to the chapter authors for their professionalism, their adherence to schedules, their enthusiasm, their patience, and, most of all, their high-quality contributions. We thank our collaborators at Wiley-VCH, especially Dr. Anne Brennführer and Dr. Stefanie Volk, for their invaluable help from the conception to the realization of this project, and our project manager, Mamta Pujari, for unifying text and style.

Lausanne, Switzerland
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