

Preface

The book *Modern Amination Methods*, I edited for Wiley-VCH in 2000, was intended to provide an almost exclusively methodological overview of several research areas in which amination plays a key role and to introduce the reader to new concepts that were at that time developed for generating new C–N bonds. The book was well received by the chemical community and indicated the need for keeping scientists aware of the progress in the field of amino group chemistry. The increasing importance of the amino function, in simple or complex molecular systems, is in fact fully acknowledged by chemists due to the presence of these molecules in the most important areas of basic and applied chemistry, such as pharmaceutical, medicinal, agricultural and natural product chemistry, and even more and more in biochemistry. Far from being exhausted, this topic seeks novel breakthroughs to face the novel challenges of third millennium chemistry. This prompted the writing of a new book, focusing not only on the C–N bond forming methodologies, but also on the role played by the amino function in those processes that are more closely related to the life sciences.

The contributions to this book are organized into interlinked sections and will include several important aspects related to amino group chemistry. The first part of the book deals with several more methodologically addressed chapters. Not only is the use of simple amination reagents and pivotal intermediates disclosed, making thus wider the already rich arsenal of conventional and unconventional amination methods, but also the potential of synthetic strategies like MCR (multicomponent reactions), or the most up-to-date metal- or organo-catalyzed approaches to the assembly of polyfunctional complex nitrogen-containing molecules is highlighted. Throughout each chapter, clear structures, schemes and figures accompany the text. Synthetic procedures, mechanisms, reactivity, selectivity and, especially, stereochemistry are addressed. An emphasis is placed, even at this stage, on target oriented synthesis with the insertion of the generated amino function into N-containing densely functionalized chiral molecules, or precursors thereof, of interest in medicinal chemistry.

In the following chapters there is a greater focus on the life sciences. The relevant role played by core units containing a preformed amino functionality, many of them coming from the chiral pool, in the construction of important targets in medicinal chemistry, exhibiting among others anticancer, antibiotic and antiviral

activity, is discussed with a rich series of examples. An even deeper insight into the field of clinically relevant drugs containing amino functionalities is provided by those chapters dealing with the synthesis and biological activity of aminated sugar and with the selective N-modification of aminoglycosides. The primary importance of the amino group in glycol structures, toning the physico-chemical properties, actively participating in recognition phenomena and, in the case of iminosugars, in enzymatic inhibition, and the role of the amino functions in RNA binding are treated in detail.

The last chapter is devoted to the industrial approach to amination reactions via transition metal catalyzed aryl amination. The progress in this field and the transformation of formerly extremely difficult processes into trivial tasks with lots of possibilities for fine tuning apt to the large scale production of modern synthetic targets, are disclosed.

This book is timely and the up-to-date reference sections together with several laboratory protocols would make it immediately useful also for those researchers not familiar with this field. It is aimed at a mixed audience including advanced students, young researchers and, more generally, people working in scientific institutions dealing with chemistry. Industrial chemists looking for a survey of well-tried fundamental concepts as well as for information on modern development in amino group chemistry, are also likely to be interested in this book considering the extensive number of industrially important targets treated.

As far as I know there are no books closely related to or similar to this book. The only exception could be the already mentioned *Modern Amination Methods* published by Wiley-VCH in 2000. This fact, instead of constituting a point of weakness, guarantees that the new book will not give rise to a substantial superimposition with the previous publication but on the contrary will be fully complementary to it.

I would like to thank all the distinguished scientists and their coauthors for their rewarding, timely and well-referenced contributions. Grateful acknowledgements are offered to the Wiley-VCH editorial staff, in particular to Dr. Manfred Koehl for proposing to me this new challenge and to Dr. Waltraud Wuest who was of precious help for the development of this project.

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