

Preface

Porphyrins and related macrocycles have fascinated and still continue to attract the attention of researchers belonging to different disciplines. It is impressive to note how these macrocycles are included in research articles spanning a huge number of different specialties, from medicine to material chemistry. The life is possible thanks to these macrocycles, but the richness of their properties makes porphyrins interesting for a wide range of fields, ranging from clinical applications to photo-voltaic cells.

The first volume dedicated to porphyrinoids of Topics in Heterocyclic Chemistry is focused on some synthetic aspects of porphyrins and related macrocycles, because for all the studies and applications of the beautiful collections of porphyrinoids, the preparation and modification of these macrocycles is of course a necessary step.

In the first chapter titled “The McMurry Reaction in Porphyrinoid Chemistry” Kevin M. Smith, a leading researcher in the porphyrin area, describes the exploitation of the McMurry reaction for the macrocyclization route to the preparation of porphyrin analogues and for the preparation of bis-porphyrinoid systems.

The second chapter titled “Meso-tetraarylporphyrins: Synthetic Strategies and Reactivity Profiles Based on Nitro/Amino Substituents” presents an update on the preparation of nitro- and amino-derivatives of *meso*-tetraarylporphyrins and their exploitation for the further modification of the macrocycle to give other functionalized porphyrins; this chapter is authored by Maria G. P. M. S. Neves with Vanda I. Vaz Serra, Sónia M. G. Pires, Cristina M. A. Alonso, Augusto C. Tomé and José A. S. Cavaleiro.

In the third chapter titled “Functionalization of Corroles” the attention is focused on the functionalization of corrole, a contracted porphyrinoid that has object of intensive researches in the last decade, due to some peculiar characteristics of such a macrocycle. The chapter is surveyed by José A. S. Cavaleiro, Joana F. B. Barata, Carla I. M. Santos, M. Graça P. M. S. Neves, M. Amparo and F. Faustino and discusses the reactivity of corrole towards both electrophilic and nucleophilic reagents, describing the different functionalities that can be introduced in the corrole skeleton.

The fourth chapter titled “Degradation Pathways for Porphyrinoids” describes the degradation pathways of porphyrinoids, which are processes of interest for several aspects, ranging from catalysis to biochemistry. This chapter authored by Jacek Wojaczyński indicates that the degradation term in the case of porphyrinoids should not be considered negatively, because they can offer the opportunity to easily obtain linear oligopyrroles or to convert the parent porphyrinoid in a different macrocycle.

In the fifth chapter titled “Synthetic Routes to Porphyrinoids” Sara Nardis is back to describe porphyrin chemistry, presenting an update of the synthetic routes for the preparation of porphyrin bearing an unsymmetrical pattern of peripheral substituents, which is interesting for the exploitation of porphyrin in different application fields. This goal can be achieved by both the direct preparation of the macrocycle and the successive regioselective functionalization of a symmetrical porphyrin.

In the sixth chapter titled “Recent Developments of Non-covalent Porphyrin Assemblies” Donato Monti describes the recent advancements related to non-covalent porphyrin aggregates featuring supramolecular chirality, illustrating the preparation, the properties and the potential applications of these suprastructures.

Finally I would like to sincerely thank all the authors for their kind cooperation in the composition of their excellent contributions to this volume.

Synthesis and Modifications of Porphyrinoids

Paolesse, R. (Ed.)

2014, VII, 296 p. 50 illus., 23 illus. in color., Hardcover

ISBN: 978-3-642-38532-2