

Synthesis of Biaryls; edited by Ivica Cepanec; Elsevier: Amsterdam, 2004, hardcover, 368 pp, € 140, ISBN 0-08-044412-1

In modern organic chemistry biaryl moieties represent common structural features, without them, many pharmaceutically active compounds, agrochemicals or liquid crystals would not exist. Therefore, the construction of biaryls is of significant interest for industry and academia. I. Cepanec, director of a R&D unit in a pharmaceutical company created this book that surveys more than 100 years of biaryl chemistry. The monograph addresses to all synthetically-oriented students and chemists. The selected synthetic procedures for most of the discussed methods transform the book into a guideline for practitioners and includes valuable information about the employed reagents. The author focussed on the biaryl coupling reactions and cyclizations yielding biaryl bonds or higher aromatic scaffolds, whereas the construction of attached aryl system using cycloadditions or condensation reactions is not treated. From the arrangement of the 8 individual chapters it is difficult to find an outlining concept of the book. This originates from the high degree of relation among the reviewed transformations which are presented in several chapters. Thus, the same facts are repeated.

After a general introduction a short contribution dealing with the classical named reactions including Ullmann reaction, Gomberg transformation, and Pschorr cyclization is given. However, the author missed to mention that the oxidative coupling of lithiated species can be performed with several metal salts in a higher oxidation state (p. 11). The next three chapters are devoted to the reductive aryl-aryl-bond formation, wherein homo- and cross-coupling processes are mixed up. Only the last part is dealing purely with the Suzuki–Miyaura reaction. For students it will be difficult to realize the similarities to related conversions. The concept of carbon nucleophile and carbon electrophile would be much more useful for the understanding. Also unusual is the accuracy of the given yields (p. 48). Furthermore, in common literature the Kharasch reaction describes not an aryl-aryl-

coupling reaction (p. 86). A relatively small chapter is devoted to the direct oxidative coupling of aryl systems. The hypervalent iodine reagents are by far under-represented (p. 227) and anodic processes are completely missing. Despite of their synthetic power, employment of diarylmercurials, organothallium, or organolead intermediates is not the cutting edge technology. The high toxicity of these heavy metal reagents prohibits the application for the synthesis of bioactive compounds and should be strongly discouraged. The 7th chapter surveys a variety of miscellaneous methods. Most of this section should better be located in previous parts. The author uses throughout the book a consequent numbering for the compounds, whereas in that chapter on some pages a different system was applied (pp. 241–243, 257). The last contribution in the book is devoted to the construction of axially chiral biaryls. In this collection the Bringmann pathway, as one of the most important methodologies to axial chiral natural products, is not correctly reported. These particular lactones are configurationally labile and by an enantioselective catalysis, e.g. the CBS reduction excellent optical purities are obtained. For the direct oxidative coupling of 2-naphthol derivatives in the presence of (–)-sparteine, the work of M. C. Kozłowski should be mentioned.

In summary, this monograph provides a less systematic overview on the aryl-aryl-coupling reaction. Unfortunately, there are several mistakes in the schemes as well as in written parts. For students this book is not recommended since it will cause more confusion than bringing benefits to the reader. Because important parts of the literature are not included, synthetically-oriented chemists should consider this book as second choice.

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