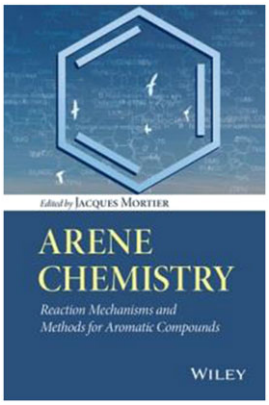
DOI: 10.1002/aoc.4129

BOOK REVIEW

WILEY Applied Organometallic Chemistry

ARENE CHEMISTRY: REACTION MECHANISMS AND METHODS FOR AROMATIC COMPOUNDS

Edited by Jacques Mortier Wiley, 2016; Hardcover £156.00, €187.20 992 pages. ISBN: 978–1–118-75201-2



(NOTE from Book Review editor: image taken from Wiley on-line site)

Arenes, compounds derived from the aromatic benzenoid nucleus, have been a fundamental part of organic chemistry since benzene was first isolated by Faraday in 1825. The field of arene chemistry has developed dramatically since then, and is now an extensive sub-branch of the field covering some three million compounds. Research into arenes continues to grow year on year. Derivatives of benzene, and its fused polycyclic analogues, display a seemingly vast and disparate array of structural types, properties and reactions, which can be disconcerting to new students in the field, or even to experienced researchers seeking a highly specific and selective method for a single type of compound. Due to their prevalence in pharmaceutical, agrochemical, and materials applications, no chemist can now go afford to go unacquainted with the essential aspects of the properties and chemical reactions of arenes. In *Arene Chemistry* Jacques Mortier has brought together contributions from leading practitioners in universities and research institutes from around the world to create a concise but comprehensive text on aromatic chemistry. The book consists of 32 chapters, in 10 parts, which cover both classical aromatic chemistry, as well as very recent developments in the field. The 959 pages however do not feel weighty, and it is easy to find one's way around the topics.

The fundamentals of electrophilic substitution and nucleophilic aromatic substition, still essential undergraduate material, are covered in parts I and II. The versatility of the highly reactive arynes is described in part III, while reduction and oxidation, including de-aromatizing reactions leading to saturated or partially saturated derivatives, makes up the content of section IV. Chapters 16–18, comprising the fifth part, report ring forming and rearrangement reactions involving pericyclic processes or metathesis, useful for constructing polycyclic systems, as well as substituent migrations such as the Smiles rearrangement. The power of transition metals to catalyse coupling of arene rings, as well as ring functionalisation, is perhaps now the most important feature of arene chemistry and is widely exploited in industry for synthesis. Seminal and recent developments are discussed in depth in chapters 19–22 in part VI. C-H activation and directed metallation, also strategically important synthetic methods, are covered in part VII. The ability to direct the regiochemistry of metallation in the presence of other substituents has now reached an extraordinary level of control, and allows the construction of complex and elaborately functionalised arene derivatives. Lastly photochemical reactions, and biotransformations are covered in parts IX and X respectively. The latter includes fascinating enzymatic transformations such as oxidation, halogenation and even nitration.

This comprehensive book ventures successfully to put all of aromatic chemistry into one convenient sized and handy volume. The editor and contributors are to be congratulated for taking on such an ambitious project. They have effectively condensed the essential material, and made an ideal source of information; whether one is looking to locate specific conditions for a single transformation, or whether one just wishes to read up on the underlying mechanistic and synthetic principles of a particular topic, this book will be an ideal starting point. The book will be of interest to all researchers in industry and academia working with arene compounds, as well as advanced undergraduates wishing to develop their knowledge of this essential field.

George Weaver
Loughborough University, UK
Email: G.W.Weaver@lboro.ac.uk