

“Heterocycles from Double-Functionalized Arenes: Transition Metal Catalyzed Coupling Reactions”

By Xiao-Feng Wu (Leibniz Institute for Catalysis, Germany; and Zhejiang Sci-Tech University, China) and Matthias Beller (Leibniz Institute for Catalysis), RSC Catalysis Series, No. 24, Royal Society of Chemistry, Cambridge, UK, 2015, 301 pages, ISBN: 978-1-78262-136-2, £179.00

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The RSC Catalysis Series book: “Heterocycles from Double-Functionalized Arenes: Transition Metal Catalysts” by Xiao-Feng Wu and Matthias Beller consists of four chapters covering about 300 pages.

The Synthesis of Heterocycles

Heterocycles are always an interesting class of compounds due to their immense number of applications in pharmaceuticals, agrochemicals and fine chemicals. Unlike the classical methods for their syntheses, this book gives a concise update on the construction of the second heterocyclic ring using *ortho*-disubstituted aryl starting materials for accessing both five-membered and six-membered rings (Chapters 2 and 3) using some of the modern transition metal catalysts. I like the systematic approach of this book, starting with a list of frequently used double functionalised arenes

(Chapter 1). The technology described in the book seems to be developed and inspired from Larock’s seminal heteroannulation reactions (1). There is a short chapter on macro heterocycle synthesis, showing the synthesis of somewhat larger molecules. Although palladium catalysts are widely used for these transformations, there are examples using other metals such as nickel and copper.

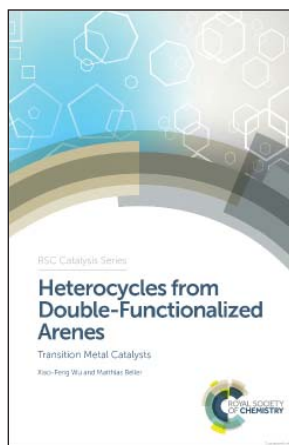
There are several other books available on the synthesis of heterocycles using transition metal catalysts (2, 3).

Conclusion

Since it is a specialised book for those who want to get an idea of how *ortho*-difunctionalised reagents can be used for five-membered and six-membered rings, this book will be very handy. Typical experimental protocols are listed throughout, although these experiments are taken directly from academic publications, with very little information on their merits in industry. However, this is not a severe criticism of the book. Hopefully this book will inspire those who are in industry to be aware of these methods for practical applications. Overall it is decent book to have in your library, if you are interested in modern methods for the synthesis of certain heterocycles.

References

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3. J. J. Li and G. W. Gribble, "Palladium in Heterocyclic Chemistry: A guide for Synthetic Chemist", 2nd Edn., *Tetrahedron Organic Chemistry Series*, Vol. 26, Elsevier, Oxford, UK, 2007



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The Reviewer



Thomas Colacot is a Johnson Matthey Technical Fellow/Global Research and Development (R&D) Manager in Homogeneous Catalysis (Fine Chemicals Division) managing new catalyst development, catalytic organic chemistry processes, ligands, scale-up and technology transfers. He is a co-author of about 100 articles and several patents and a Royal Society of Chemistry (RSC) book, "New Trends in Cross-Coupling: Theory and Applications" (2014). He has received the 2015 American Chemical Society (ACS) Industry Chemistry Award, 2015 International Precious Metals Institute (IPMI) Henry Alfred Award, 2016 Chemical Research Society of India (CRSI) Medal by the Chemical Research Society of India and the Indian Institute of Technology (IIT) Madras Distinguished Alumnus Award (2016) and the 2012 RSC Applied Catalysis Award.