

## “Catalytic Arylation Methods: From the Academic Lab to Industrial Processes”

By Anthony J. Burke and Carolina Silva Marques (University of Évora, Portugal), Wiley-VCH, Weinheim, Germany, 2015, 400 pages, ISBN: 978-3-527-67285-1, £134.00, €180.90, US\$222.00

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### Introduction

The book describes an overview of the various arylation methods under metal-catalysed conditions. There are nine chapters covering about 500 pages which are:

1. ‘Cross-Coupling Arylations: Precedents and Rapid Historical Review of the Field’
2. ‘Amine, Phenol, Alcohol, and Thiol Arylation’
3. ‘Decarboxylative Coupling Techniques’
4. ‘C–H Bond Activation for Arylations’
5. ‘Conjugate Additions’
6. ‘Imine Arylations – Synthesis of Arylamines’
7. ‘Carbonyl Group Arylation’
8. ‘ $\alpha$ -Arylation Processes’
9. ‘Catalytic Cycloaddition Aromatization Processes’.

### A Modern Approach

This book came after Lutz Ackermann’s (Georg-August-Universität Institut für Organische und Biomolekulare

Chemie, Germany) 2009 book (1) by the same publisher. It is interesting to note that Marko Hapke wrote reviews on these two books (2, 3) in which he compared how this book is different, hence we don’t intend to make any comparisons to avoid duplication.

We are delighted to observe that in Chapter 1, the authors copied the chart (Figure 1.1) from our review (4) to include the already existing information, rather than replicating the efforts. I am particularly impressed by Chapters 3, 6 and 9 which are on subject matter not usually featured in many of the recent books on related topics.

Each chapter opens with a quote from famous scientists such as the Nobel Laureate Physicist, Richard Feynman (1918–1988):

“It doesn’t matter how beautiful your theory is, it doesn’t matter how smart you are. If it doesn’t agree with experiment, it’s wrong.”

Although these quotes increase the readability, for some reason, personally I am not able to relate the quote fully to the contents of the respective chapters. In addition, each chapter ends with a conclusion, for example, in Chapter 1 the authors quoted Didier Astruc (Groupe Nanosciences Moléculaires et Catalyse Université Bordeaux, France):

“In conclusion, the field of palladium-catalyzed cross-coupling reactions for their work in which

Heck, Negishi and Suzuki were awarded the 2010 Nobel Prize in chemistry is extremely rich and productive and will continue to grow with major synthetic applications and 'green' implications in the future." (5)

Although palladium is the 'king' of arylations (6), the authors did include other metals such as ruthenium, rhodium, iridium and even base metals such as copper, iron and nickel. This will be useful for chemists from academia and industry to look 'out of the box'. The authors also tried to incorporate some model experimental reactions from the literature at the end of each chapter, which will be very useful for those who practice organic and organometallic chemistry.

If I have to be critical the chapters are not comprehensive. Some systematic approach also seems to be missing. The reason for that is that each chapter can be developed into a book; therefore I am amazed to see the quantum (amount) of work by these two authors to produce this book.

## Conclusion

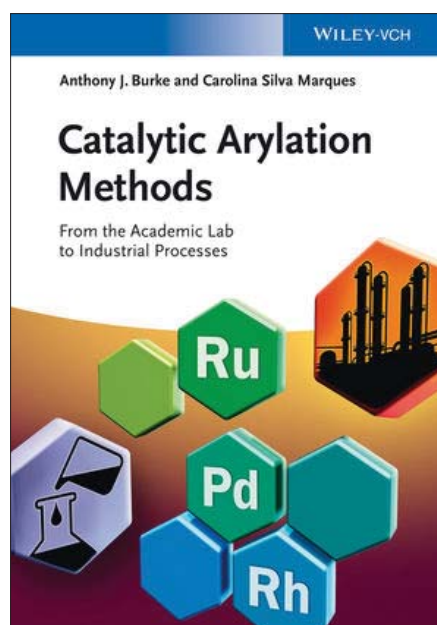
Overall this book complements other books such as the above mentioned book by Ackermann (1) and other works by Colacot (7), and by Javier Magano and Joshua Dunetz (Pfizer Inc, USA) (8). I recommend chemists buy this for their libraries.

## References

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6. S. K. Ritter, *Chem. Eng. News*, 2016, **94**, (18), 20
7. "New Trends in Cross Coupling: Theory and Applications", ed. T. Colacot, RSC, Cambridge, UK, 2014
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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.