Catalyst-free organic synthesis

Citation for published version (APA):

Jin, C. (2018). Catalyst-free organic synthesis. *Green Processing and Synthesis*, 7(2), 180-180.
<https://doi.org/10.1515/gps-2017-0184>

DOI:

[10.1515/gps-2017-0184](https://doi.org/10.1515/gps-2017-0184)

Document status and date:

Published: 01/04/2018

Document Version:

Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.tue.nl/taverne

Take down policy

If you believe that this document breaches copyright please contact us at:

openaccess@tue.nl

providing details and we will investigate your claim.

Book review

Catalyst-free organic synthesis

<https://doi.org/10.1515/gps-2017-0184>

Goutam Brahmachari

Royal Society of Chemistry, 2017

Green Chemistry Series

391 pp.

Print (hardcover) ISBN: 978-1-78262-412-7

Since the early 1990s, the concepts of “green” and “sustainable” have gradually entered people’s minds and have now gained popular support. They have made notable progress and significant contributions to chemical science and technology. As a significant composition of green chemistry, catalyst-free organic synthesis has been rapidly developed and widely used as it is a straightforward, low cost, convenient process for easy separation and purification. Normally, considerable catalysts are not only expensive but also difficult to recycle and thus be a waste of money and cause environmental pollution. Therefore, the development and application of catalyst-free organic reactions is of great significance and will surely focus the attention of researchers, meanwhile, it must be a benefit to the chemical industry and to all of us.

This book *Catalyst-free organic synthesis*, by Goutam Brahmachari, is divided into six chapters, in which the author addresses catalyst-free topics under conditions such as: room temperature, conventional heating, microwave irradiation, ultrasound irradiation and ball milling. It is very comprehensive, and has exhibited the state-of-the-art technology in green chemistry.

Chapter 1 is an introduction, here the reader can find an overview of the contents of the book.

In chapter 2 the author details many catalyst-free organic reactions at room temperature; these are present in a very organized way. The reactions in this chapter belong to the most straightforward, energy-efficient, and environmentally-friendly methods we can imagine and what we need most. Such reactions will certainly become the favorable choice of researchers.

In chapter 3, the author describes the catalyst-free organic reactions under conventional heating conditions. Although requiring extra energy, it is still a popular method for chemists as simple heating or refluxing is easy to operate, and can give many synthetically and pharmaceutically useful chemicals.

In chapters 4 and 5, the author summarizes a series of microwave- and ultrasound-assisted catalyst-free organic reactions. These give chemists the ability to succeed in what cannot be achieved under the traditional thermal conditions in a very short time, sometimes only a few minutes, so they are more energy efficient.

In chapter 6, the author presents readers with a new branch of research in modern synthetic methods named mechanochemistry together with catalyst-free conditions. By input mechanical energy via ball-milling it can greatly promote chemical transformation in the solid state. Therefore, it is both catalyst- and solvent-free, meaning complete elimination of catalyst and organic solvent during the reaction. As we know the use of large amounts of volatile organic solvents in the chemical industry inevitably results in environmental pollution, thus catalyst- and solvent-free reactions are of great interest and should be strongly promoted.

All entries include general reaction schemes, representative examples, experimental procedures, product characterization and critical views. Type of reaction, reaction conditions, synthetic strategies and keywords are summarized in each case, so it gives readers impressive information. Furthermore, in complicated examples the reaction mechanism is provided concisely, which makes it easier for the reader to understand.

In conclusion, this book is a great piece of technical literature and unique in regards to being about “Catalyst-free” as there are many books on “catalyst-based organic synthesis”. In terms of completeness one could recommend considering, in the second edition, a broader scenario of reaction classes, e.g. including “photo-catalyst-free” references. The book provides a broad overview of state-of-the-art catalyst-free reactions in organic synthesis. It is strongly recommended for chemical researchers as well as for interested teachers and students, especially those who are involved in catalysis.

Can Jin

Department of Pharmacy

College of Pharmaceutical Sciences

Zhejiang University of Technology

Hangzhou 310014, P.R. China; and

Department of Chemical Engineering and Chemistry

Eindhoven University of Technology

5612 AP Eindhoven

The Netherlands

E-mail: jincan@zjut.edu.cn; c.jin1@tue.nl