

Eco-Friendly Synthesis of Fine Chemicals. Edited by Roberto Ballini (University of Camerino, Italy). From the RSC Green Chemistry Series. Edited by James H. Clark (University of York, UK) and George A. Kraus (Iowa State University, USA). Royal Society of Chemistry: Cambridge. 2009. xii + 300 pp. \$199.00. ISBN 978-1-84755-908-1.

This book is a welcome addition to the Royal Society of Chemistry's Green Chemistry series, which is intended to provide a valuable overview for industrialists, researchers, and academics of the practical means of reducing the environmental impact of chemical processes and products. Two recently published books in the series address the topics of alternative solvents and the future of glycerol. This third book of the series is an overview of recent advances toward "practical elegance" in green chemical synthesis.

Chemists understand well that the straightforward production of any specific molecule or product is no longer the sole goal of synthetic chemistry. Practical elegance includes the objectives that chemical production must be safe, efficient, environmentally benign, and sustainable for future generations. Sustainability is difficult to define as a single term but includes minimizing energy usage, waste generation, and cost. In this book, critical new developments in efficient chemical reactions and technologies are reviewed in eight succinct chapters written by different experts in the field. The use of technologies relatively uncommon in organic synthesis, e.g., high-pressure, supported organic base, microwave, and photochemical, comprise four chapters. Additional contributions cover the use of task-specific ionic liquids and avoiding hazardous solvents in synthesis. The longest chapter, by Lombardo and Trombini, deals with catalysis in nonconventional reaction media. Excellent summaries are provided of the key factors in mechanistic and catalyst design that give rise to maximal selectivity in various catalytic

reactions. The topics reviewed include organocatalysis in green solvents, olefin metathesis, hydroformylation, and carbonylation. Environmentally benign synthesis via mechanochemical mixing and microwave irradiation and the synthesis of useful molecules avoiding hazardous solvents/catalysts will be quite useful to industrial chemists.

Five of the eight chapters are written by contributors from Italian universities. This is actually quite welcome as representatives from these universities have been stalwart contributors to emerging green chemistry and promoters of useful interactions between academia and industry through the InterUniversity "Chemistry for the Environment" (INCA) Consortium, founded in 1993. This consortium has had a significant role in promoting a strongly integrated approach to the concept of green chemistry as science in the service of humanity.

As with any book having multiple authors, there is some degree of unevenness between individual contributions. A chapter dealing with the synthesis of complex rod-like molecules and macrocycles by cascade reactions is very interesting but is somewhat out of place. The chapter on high-pressure organic reactions provides a useful review, but most of the references are more than five years old. The overall organization of this book, however, is quite good, and the technologies and reactions reviewed are well written and presented in a useful focus. The references provided represent key contributions within the areas of focus and are timely for the most part. This contribution should find good use among industrial chemists faced with the requirements of providing eco-friendly processes and academics as a review of recent advances in green chemical processing.

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