

BOOK REVIEWS

Green Chemistry and Catalysis

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As stated by the authors in the preface, the book is aimed at researchers, in industry or academia, who are involved in developing processes for the manufacture of chemicals. The focus of the book is to share the available information concerning the use of more “green” chemical processes to manufacture materials and to provide real examples of comparisons of the different methodologies enabling the chemist to manufacture materials in a more environmentally acceptable and sustainable fashion. Throughout the book it is stressed that key to the future of being more “green” and being able to sustain the sources of raw materials is the application of homogenous, heterogeneous, and enzymatic catalysis to future processes.

The book is well written, and assumes a good working knowledge of industrial organic synthetic chemistry from which comparisons are made between presently used, standard chemical processes and “green”, sustainable chemical and biocatalytic processes. The book is written by concerned chemists for working chemists and those who will be chemical professionals and is not for the novice or casual “green” advocate. The authors hope the book is useful to those presently working in process development and as a textbook for upper undergraduate and graduate coursework.

The subjects covered include acid and base catalysis, catalytic oxidations and reductions, carbon-carbon bond formation reactions, hydrolysis reactions, reactions in novel media, i.e., solvents, super critical fluids, ionic liquids, and the use of renewable raw materials. Numerous examples are presented of how more “green” processes can be and have been successful and, also, encouragement is given to those doing process development to look for environmentally better solutions rather than to just stick with conventional chemical methodologies. It is evident that the authors believe that integrating advances in biotechnology, materials science, and reaction and process design are essential to a sustainable future chemical industry. Although traditional chemistry is discussed, the use of bio/enzymatic catalysis over conventional catalysis is frequently emphasized which to one not familiar to this technology may be a hindrance to fully understanding some of the subject matter.

In the extensive list of references included at the end of each chapter, the authors attempt to provide the principal literature through 2006. The numerous equations, charts and tables are well done and readily understood. The overall quality of the book is high. I would have expected the publisher would have used recycled paper, etc. to reinforce the green theme of the book but they did not. Although a bit pricey, I would recommend this book to all process development chemists and chemists in general.

Reviewed by : Kenneth Abate, PhD, FAIC, CPC