DESCRIPTION

Exhibiting both homogeneous and heterogeneous catalytic properties, nanocatalysts allow for rapid and selective chemical transformations, with the benefits of excellent product yield and ease of catalyst separation and recovery. This book reviews the catalytic performance and the synthesis and characterization of nanocatalysts, examining the current state of the art and pointing the way towards new avenues of research. Moreover, the authors discuss new and emerging applications of nanocatalysts and nanocatalysis, from pharmaceuticals to fine chemicals to renewable energy to biotransformations.

_Nanocatalysis_ features contributions from leading research groups around the world. These contributions reflect a thorough review of the current literature as well as the authors’ first-hand experience designing and synthesizing nanocatalysts and developing new applications for them. The book’s nineteen chapters offer a broad perspective, covering:

- Nanocatalysis for carbon-carbon and carbon-heteroatom coupling reactions
- Nanocatalysis for various organic transformations in fine chemical synthesis
- Nanocatalysis for oxidation, hydrogenation, and other related reactions
- Nanomaterial-based photocatalysis and biocatalysis
- Nanocatalysts to produce non-conventional energy such as hydrogen and biofuels
- Nanocatalysts and nano-biocatalysts in the chemical industry
Readers will also learn about the latest spectroscopic and microscopy tools used in advanced characterization methods that shed new light on nanocatalysts and nanocatalysis. Moreover, the authors offer expert advice to help readers develop strategies to improve catalytic performance.

Summarizing and reviewing all the most important advances in nanocatalysis over the last two decades, this book explains the many advantages of nanocatalysts over conventional homogeneous and heterogeneous catalysts, providing the information and guidance needed for designing green, sustainable catalytic processes.

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