Non-Noble Metal Catalysis: Molecular Approaches and Reactions

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DESCRIPTION

An expert overview of current research, applications, and economic and environmental advantages.

The study and development of new homogeneous catalysts based on first-row metals (Mn, Fe, Co, Ni, and Cu) has grown significantly due to the economic and environmental advantages that non-noble metals present. Base metals offer reduced cost, greater supply, and lower toxicity levels than noble metals, enabling greater opportunity for scientific investigation and increased development of practical applications. Non-Noble Metal Catalysis provides an authoritative survey of the field, from fundamental concepts and computational methods to industrial applications and reaction classes.

Recognized experts in organometallic chemistry and homogeneous catalysis, the authors present a comprehensive overview of the conceptual and practical aspects of non-noble metal catalysts. Examination of topics including non-innocent ligands, proton-coupled electron transfer, and multi-nuclear complexes provide essential background information, while areas such as kinetic lability and lifetimes of intermediates reflect current research and shifting trends in the field. This timely book demonstrates the efficacy of base metal catalysts in the pharmaceutical, fine-chemical, and agrochemical industries, addressing both environmental and economic concerns.

Providing essential conceptual and practical exploration, this valuable resource:

- Illustrates how unravelling new reactivity patterns can lead to new catalysts and new applications
- Highlights the multiple advantages of using non-noble metals in homogenous catalysis

- Demonstrates how the availability of non-noble metal catalysis reduces costs and leads to immense savings for the chemical industry

- Reveals how non-noble metal catalysis are more sustainable than noble metals such as palladium or platinum

Non-Noble Metal Catalysis: Molecular Approaches and Reactions is an indispensable source of up-to-date information for catalytic chemists, organic chemists, industrial chemists, organometallic chemists, and those seeking to broaden their knowledge of catalytic chemistry.

### ABOUT THE AUTHOR

**Robertus Klein Gebbink, PhD,** is full professor at Utrecht University, The Netherlands. His current research interests include homogeneous catalysis, organometallic chemistry, and bioinorganic chemistry, with a specific focus on iron-based catalysis, the immobilization of homogeneous catalysts and the catalytic conversion of biomass into chemical building blocks.

**Marc-Etienne Moret, PhD,** is assistant professor at Utrecht University, The Netherlands. His research interests lie in the organometallic chemistry of base metals with the aim of using these cheap, nontoxic metals to promote (in)organic transformations of environmental / industrial significance.

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