

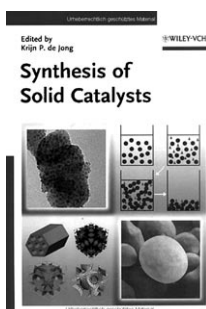
Solid Solutions

Synthesis of Solid Catalysts

Edited by Krijn P. de Jong

Wiley-VCH, Weinheim, 2009. 422 pp., hardcover, € 138.00.—ISBN 978-3-527-32040-0

This book provides a complete and comprehensive description of physical and experimental parameters, which are necessary to prepare solid catalysts in more rigorous and predictive ways. It is divided into two parts and 17 chapters written by experts in the field (see below). The first part provides the basic fundamental principles for each elementary step (operating unit) of catalyst preparation and reviews the different methods used to prepare a solid catalyst, from classical techniques used in industry, including contributions from M. V. Landau on sol-gel processing, K. P. de Jong on deposition precipitation, and M. Lok on co-precipitation as well as a chapter by B. Kraushaar-Czarnetzki and S. P. Müller on the shaping of solid catalysts, which is critical in industrial applications. Immobilization strategies, for example, for supported homogeneous catalysis, which are mainly developed in academia, have also been included (S. Hermans). It would have been interesting to discuss their advantages and dis-



advantages with respect to classical heterogeneous catalyst preparation used in industry, highlighting recent progress and the current problems. It would have also been interesting to include discussion of new materials, such as metal-organic frameworks, carbon nanotubes, or graphene, other supports such as polymers, and other immobilization strategies such as encapsulation. This part also provides information about characterization tools, from standard tools to the most modern techniques, such as space- and time-resolved spectroscopy of catalysts, expanded upon by B. M. Weckhuysen. Finally, advanced techniques for the preparation of catalyst libraries are also discussed, showing the potential of high-throughput technologies to optimize catalyst formulation (U. Rodemerck and D. Linke).

The second part of the book concentrates on catalyst preparation through case studies. This part includes sections on zeolite synthesis, by M. Bulut and P. A. Jacobs, and advanced sol-gel chemistry to prepare oxide supports as well as hybrid organic-inorganic materials (Ordered Mesoporous Materials by Y. Wan and D. Zhao). One chapter, by S. Eijssbouts, is devoted to hydrotreating catalysts, highlighting that better preparation methods are still needed despite years of research. Preparation of supported metal nanoparticles is also discussed, including chapters devoted to specific examples, such as methanol synthesis catalysts (S. Schimpf and M. Muhler), noble-metal catalysts (S. Soled)

and gold catalysts (C. Louis). These examples really illustrate the problem of metal oxide interfaces. This part typically delineates the complexity associated with the development of heterogeneous catalysts, for example, control of the particle size and distribution, catalyst composition and formulation, or the effect of supports.

Overall, chapters are well written. They often include the most advanced spectroscopic and computational studies as a way to understand catalyst preparation. This book allows the understanding of a complex subject for people of various backgrounds, interests and levels, both from academia and industry, and the editor and the authors have succeeded in this giant task. Therefore, this book can be used to illustrate catalyst preparation at the advanced stage of graduate studies, in particular in Masters Programmes devoted to catalysis or in summer/winter schools on special topics regarding this subject. It would be interesting to develop an interactive video presentation of this book, which could be used in classes. This book will likely become the new reference book for this field, and will be found on the book shelves and on the desk of students and experts, whether in industry or in academia.

Dr. Christophe Copéret
Université de Lyon
(France)

DOI: 10.1002/cctc.201000072