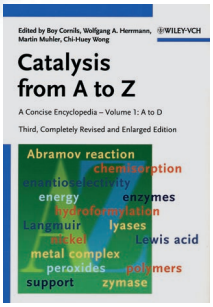
Catalysis from A to Z



A Concise Encyclopedia. Vols. 1–3, 3rd ed. Edited by *Boy Cornils*, *Wolfgang A. Herrmann*, *Martin Muhler* and *Chi-Huey Wong*. Wiley-VCH, Weinheim 2007. 1560 pp., hardcover € 549.00.—ISBN 978-3-527-31438-6

Catalysis plays a key role in competitiveness and sustainable development. Catalytic processes not only have a significant market in themselves, but have an impact on world economics that is one to two orders of magnitude greater. Catalysis is also at the heart of most of the processes and technologies for sustainable development and for the reduction of the environmental impact of industrial production. Finally, catalysis is well recognized as a priority for developing advanced materials and a key player in advances in nanotechnologies. The award of the 2007 Nobel Prize in Chemistry to G. Ertl further demonstrate the relevance of catalysis for chemistry, science, and our sustainable development and quality of life.

Catalysis is thus a key enabling technology for society, but the associated development and applications require multidisciplinary competences (engineering, chemistry, physics, applied catalysis, materials science, etc.), and present interesting challenges in areas ranging from fundamental studies (surface science, theory, and modeling) to industrial applications. Tackling such challenges in the future will require further efforts on interdisciplinary and multidisciplinary approaches and on bridging the gap between fundamental science and technology. This requires using the correct terminology to communicate between cultural areas that are often widely different, and having a minimum set of common competences that facilitate the exchange of information. For this reason, there is a need for a concise encyclopedia, which explains in a few sentences the concepts and terminologies used in the various areas of catalysis, since researchers in disciplines such as homogenous, heterogeneous, and biological catalysis, as well as industrial process engineers, have all developed specialist terminologies for their fields. In addition, managers in chemical companies often need to better understand specialized terms, or to have concise descriptions of important industrial processes. Because of the increasing use of catalysts outside the traditional fields, often by people with only a minimal background in chemistry and catalysis, there is a need for concise descriptions of aspects such as the preparation of catalysts, their characterization by different methods, and their applications. These people will never look at the established books and encyclopedias on catalysis, as these are too specialized. Also the Internet, unlike a concise encyclopedia, cannot always provide them with reliable answers.

Therefore, the first edition of the concise encyclopedia *Catalysis from A to Z* already earned a positive evaluation and attracted a wide readership, which ranged from chemists, biochemists, physicists, and engineers to non-technical people such as journalists, policy makers, managers, and business people who needed to find a quick answer and verification about particular terms and concepts. Thus, the book is suitable for both specialized and general libraries. An edition accessible on the Internet would also be welcome in this sense, as it would further open up accessibility.

Practice is often better than theory. Therefore, I carried out two experiments to test whether the concise encyclopedia could really find extensive use in practical life and research. For this, I made the three volumes accessible firstly to students in the area of industrial chemistry and secondly to a group of researchers and managers in a company. Both experiments gave very positive results. Therefore, I would strongly recommend *Catalysis from A to Z*, not only to all scientists and engineers in the field of catalysis, but also to scientific and general libraries, where researchers looking at interdisciplinary areas and other people (from journalists to managers) can find the correct definitions of terms and concepts associated with catalysis.

This third edition is a truly impressive revised and enlarged work. From the single volume of the first edition, with approximately 3000 keywords, the work has grown to the present three volumes with about 8000 keywords. A valuable feature is that some keyword articles refer to a Figure or a table (in total, references to 3100 figures and 110 tables). There are more than 3300 cross-references, and several keyword articles also give references to French or German translations, a further bonus. More than 260 authors contributed to the compilation of the articles, about 70 more than in the 2nd edition. (Most of the best known specialists have contributed to the encyclopedia, but unfortunately not the winner of the 2007 Nobel Prize, G. Ertl.) The articles on the more general terms have been written by the editors themselves, whose specialist fields cover different complementary aspects of catalysis. The articles by external contributors have also been edited to give homogeneity to the text. R. Schlögl is no longer on the editorial board, but has been replaced by Martin Muhler as an expert on heterogeneous catalysis. All the articles from the former editions have undergone careful revision. It would always be possible to find defects in the encyclopedia, such as the absence of a particular keyword, or some small imperfection in the terminology, but on the whole this third edition represents a really significant step forward in trying to give a complete coverage of catalysis and a solid reference book on terminology and concepts.

One of the most valuable features of the encyclopedia is the inclusion of short descriptions of the main catalytic processes used by leading chemical manufacturers, often with a simplified flowsheet and a few references for further

reading. There is also an initial section containing a list of the general references cited in the encyclopedia, which serves as a kind of recommended virtual library for textbooks on catalysis.

When possible, indications of patents and patent applications have also been added to illustrate the technical status of processes. Economic data on annual production, catalyst consumption, etc., have been included wherever possible. In both these cases, it is clearly impossible to achieve a complete coverage of information that is rapidly changing. However, it is useful to have a reference point.

In conclusion, *Catalysis from A to Z* in this third edition is a valuable expert guide for all people (researchers or others) who seek concise definitions of terms and concepts related to catalysis, or need a better understanding of issues related to catalysis. The readership is potentially very broad, from students and researchers in the areas of chemistry, chemical engineering, materials science, and biotechnology to nontechnical people who need concise definitions or explanations of concepts. Therefore, the work is recommended for libraries, and as a reference source for personal use or in research laboratories. Finally, I recommend journalists, policy makers, and managers to use the work, where they can find a quick reference to avoid possible mistakes when discussing technical points related to catalysis and its key role for society and environmental sustainability.

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