Host-Guest Systems Based on Nanoporous Crystals

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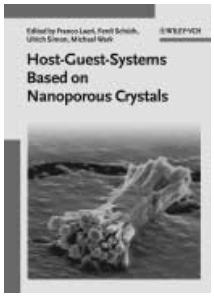
Wiley-VCH, Weinheim 2003. XXV-662 pp., hardcover €169.00.—ISBN 3-527-30501-7

Ever since the discovery of ZSM-5 in the sixties, the templated synthesis of microporous materials has been a booming research field. More than one hundred structure types of microporous zeolites and aluminium phosphates have been synthesized and described. The templates are organic molecules with a carefully designed molecular architecture and functional groups. In the early nineties the field was expanded to mesoporous materials with the use of amphiphilic molecules as templates. These molecules form micelles, liquid crystals and other types of aggregates in solution, around which the inorganic structure is built. We have now a whole range of inorganic mesoporous materials or hybrid organic–inorganic mesoporous materials. The mesoporosity of the materials gives an enormous potential for surface modification and enlarges the potential of application with respect to that of microporous materials. Thus, zeolites or microporous materials in general find their use mainly in ion exchange, selective adsorption, gas separation and heterogeneous gas-phase catalysis. Mesoporous materials can not only be fine-tuned for heterogeneous liquid phase catalysis with bulky organic and pharmaceutical molecules, but also to obtain materials with unique optical and electronic properties.



The field of microporous materials has been covered in numerous books, review papers and book chapters. Don Breck's standard textbook on zeolites is a must on the bookshelf of the researcher and so is "Introduction to Zeolite Science and Practice" (Eds.: H. van Bekkum, E. M. Flanigen, P. A. Jacobs, J. C. Jansen), *Studies in Surface Science and Catalysis*, *vol. 137*, Elsevier, Amsterdam **2001**; and "Molecular Sieve Science and Technology" (Eds.: H. J. Karge, J. Weitkamp), Springer, Berlin, **2002**. These books cover all important areas of the field and are mainly concentrated on, or uniquely devoted to, microporous materials, especially zeolites.

The scope of the book under discussion is totally different. The title "Host-Guest systems Based on Nanoporous Crystals" indicates that the book covers both microporous and mesoporous materials. It discusses how materials can be obtained with new electrical, electronic and optical properties. So, it is a material science book, not a book on catalysis and adsorption. The materials have not yet found their way into industrial applications. In that way it is a book that discusses the exploratory research which has been performed in the last years. Apparently, the book is solely devoted to the German research in the area, as the contributing authors are all active in German research laboratories.

The book is divided into four parts: 1) synthesis, 2) structure and dynamics, 3) electrical and electronic properties and 4) optical properties. Each part has a short introductory chapter, which is followed by a range of contributions of different research laboratories, each discussing their results in the frame of the existing concepts and literature data. In that way a diversity of subjects is treated in 32 chapters. All chapters are independent of each other. It is therefore possible to select a chapter and to read it independently of all the others. Also, some chapters appear that are—at first sight—not expected in this book, such as a chapter on bassanite, one on cetineites and one on organometallic coordination polymers. These chapters do not really fit into the general scope of the book, as explained above.

The book is an excellent reference book for researchers active in the material science of microporous and mesoporous materials or for researchers or research groups who want to start research activities in the area. They can find a wealth of data on a broad range of subjects. The book cannot be considered as a textbook for a classroom, because the diversity of the subjects is too large and the level of the various contributions is too different.

The editing of the book is outstanding: the contents of every chapter are given extensively in the beginning. This is followed by the list of contributors and their addresses. Every chapter is followed by its references and there is an useful index at the end of the book. Figures are represented cleanly and we have not been able to detect grammatical errors. Congratulations.

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