

<<纳米多孔材料>>

图书基本信息

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内容概要

Porous materials are of scientific and technological importance because of the presence of voids of controllable dimensions at the atomic, molecular, and nanometer scales, enabling them to discriminate and interact with molecules and clusters. Interestingly the big deal about this class of materials is about the "nothingness" within — the pore space. International Union of Pure and Applied Chemistry (IUPAC) classifies porous materials into three categories — micropores of less than 2 nm in diameter, mesopores between 2 and 50 nm, and macropores of greater than 50 nm. In this book, nanoporous materials are defined as those porous materials with pore diameters less than 100 nm. Over the last decade, there has been an ever increasing interest and research effort in the synthesis, characterization, functionalization, molecular modeling and design of nanoporous materials. The main challenges in research include the fundamental understanding of structure-property relations and tailor-design of nanostructures for specific properties and applications. Research efforts in this field have been driven by the rapid growing emerging applications such as biosensor, drug delivery, gas separation, energy storage and fuel cell technology, nanocatalysis and photonics. These applications offer exciting new opportunities for scientists to develop new strategies and techniques for the synthesis and applications of these materials. This book provides a series of systematic reviews of the recent developments in nanoporous materials. It covers the following topics: (1) synthesis, processing, characterization and property evaluation; (2) functionalization by physical and/or chemical treatments; (3) experimental and computational studies on fundamental properties, such as catalytic effects, transport and adsorption, molecular sieving and biosorption; (4) applications, including photonic devices, catalysis, environmental pollution control, biological molecules separation and isolation, sensors, membranes, hydrogen and energy storage, etc.

书籍目录

- Chapter 1 Nanoporous Materials-An Overview G.Q. Lu and X.S. Zhao
Chapter 2 Advances in Mesoporous Materials Templated by Nonionic Block Copolymers C. Yu, B. Tian, X. Liu, J. Fan, H. Yang and D. Y. Zhao
Chapter 3 Zeolite/Mesoporous Molecular Sieve Composite Materials Do Trong On and S. Kaliaguine
Chapter 4 Chromium-Containing Ordered Nanoporous Materials P. Selvam
Chapter 5 Surfactant-Templated Mesoporous Materials: Synthesis and Compositional Control M.S. Wong and W. V. Knowles
Chapter 6 Organic Host-Guest Structures in the Solid State A. Nangia
Chapter 7 Nonsurfactant Route to Nanoporous Phenyl-Modified Hybrid Silica Materials Y. Wei, H. Dong, J. Xu, C.E. Wang, Q. Feng, K-Y. Qiu, Z-C. Li and S.A. Jansen
Chapter 8 3D Macroporous Photonic Materials Templated by Self Assembled Colloidal Spheres Z.C. Zhou and X.S. Zhao
Chapter 9 Hydrophobic Microporous Silica Membranes for Gas Separation and Membrane Reactors S. Giessler, J.C. Diniz da Costa and G.Q. Lu
Chapter 10 Synthesis and Characterization of Carbon Nanotubes for Hydrogen Storage H-M. Cheng, C. Liu, F. Li, H-T. Fang and Q-H. Yang
Chapter 11 Physical Adsorption Characterization of Ordered and Amorphous Mesoporous Materials M. Thommes
Chapter 12 Molecular Simulation of Adsorption in Porous Materials D. Nicholson
Chapter 13 Surface Functionalization of Ordered Nanoporous Silicates X.S. Zhao, A.S. M. Chong and G.Q. Lu
Chapter 14 Surface Alumination of Mesoporous Silicates R. Mokaya
Chapter 15 Acidity Measurement of Nanoporous Aluminosilicates - Zeolites and MCM-41 J. Zheng, C. Song, X. Xu, U.T. Turaga and X.S. Zhao
Chapter 16 Nanocatalysts Prepared by the Molecularly Designed Dispersion Process P. Cool, M. Baltes and E.F. Vansant
Chapter 17 Acidity-enhanced Nanoporous Catalytic Materials F-S. Xiao and Y. Han
Chapter 18 Modified Mesoporous Materials as Acid and Base Catalysts D.J. Macquarrie
Chapter 19 Lewis Acid/Base Catalysts Supported on Nanoporous Silica as Environmental Catalysts V.R. Choudhary and B.S. Uphade
Chapter 20 Nanoporous Catalysts for Shape-Selective Synthesis of Specialty Chemicals: A Review of Synthesis of 4,4'-Dialkylbiphenyl J-P. Shen and C. Song
Chapter 21 Catalysis Involving Mesoporous Molecular Sieves W.S. Ahn, G.J. Kim and G. Seo
Chapter 22 Adsorption and Transport in Nanoporous Materials J.P.B. Mota
Chapter 23 Adsorption of Organic Molecules in Nanoporous Adsorbents from Aqueous Solution R. Denoyel
Chapter 24 Functionalized Nanoporous Adsorbents for Environmental Remediation M.C. Burleigh and S. Dai
Chapter 25 Nanoporous Adsorbents for Air Pollutant Removal P. Le Cloirec
Chapter 26 Bioadsorption and Separation with Nanoporous Materials A. Daehler, G. W. Stevens and A. J. O'Connor
Chapter 27 Nanoporous Materials as Supports for Enzyme Immobilization H.H.P. Yiu and P.A. Wright
Chapter 28 A Novel Non-surfactant Route to Nanoporous Materials and its Biological Applications Y. Wei and K-Y. Qiu

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