Advanced catalysts and nanostructured materials [modern synthetic methods /

Moser, William R.

Academic Press,
1996

Monografía

The time has come for an assessment of the most important techniques for the fabrication of advanced catalysts. Catalyst production alone is more than a billion dollar business each year, and the product value of chemical processes using advanced catalysts is a few trillion dollars annually. This book seeks to provide a modern, materials science account of the best and most current techniques for the synthesis of advanced catalytic materials. Until now, there has been no single book which contains a definitive and comprehensive description of the important technologies for catalyst synthesis within the context of modern materials science. Academic researchers both in the catalytic sciences and materials sciences must have the best synthesis technologies available to accomplish the preparation of solid-state materials of specific structure and morphology. Althugh the emphasis is on new synthetic techniques for catalytic applications, the bookpresents all of the important technologies for the fabrication of electronic and structural ceramics, and superconductors. Key Features * Novel Techniques for Advanced Materials * Nanostructured Materials Synthesis * Mesoporous Molecular Sieves * Pillared Clays * Heteropoly Acids * Nanostructured Supported Metal Catalysts * Nanostructured Metal Oxide Catalysts and Materials * Nanostructured Zeolite Materials * Vapor Phase Materials Synthesis * Sonochemical Materials Synthesis * Aerosol Methods of Catalyst Synthesis * Hydrodynamic Cavitational Techniques for Catalyst and Materials Synthesis * Novel Sol-Gel Methods for Catalyst Synthesis * Supercritical Methods for Materials Synthesis * Liquid Crystal Techniques for Mesoporous Materials * Micelle Techniques for Nanostructured Catalyst Preparation * Fluidized Bed Techniques in Chemical Vapor Deposition * Flame Methods of Advanced Catalyst Synthesis

Título: Advanced catalysts and nanostructured materials Recurso electrónico] :] modern synthetic methods edited by William R. Moser

Editorial: San Diego Academic Press 1996

Descripción física: 1 recurso electrónico (xxvi, 592 p.) il

Mención de serie: Science Direct e-books

Bibliografía: Incluye referencias bibliográficas e índice

Contenido: J.C. Vartull, C.T. Kresge, W.J. Ruth, S.B. Mccullen, J.S. Beck, K.D. Schmitt, M.E. Leonowicz, J.D. Lutner, and E.W. Sheppard, Designed Synthesis of Mesoporous Molecular Sieve Systems Using Surfactant Directing Agents: Introduction. Experimental. Results and Discussion. J.B. Miller and E.I. Ko, The Role of Prehydolysis in the Preparation of ZirconiaSilica Aerogels: Introduction. Methods. Results and Discussion. F. Cavani, A. Colombo, F. Giuntoli, F. Trifiro, P. Vazquez, and P. Venturoli, The Chemistry of Preparation of V-P Mixed Oxides: Effect of The Preparation Parameters On The Catalytic Performance in n-Buntane and n-Pentane Selective Oxidation: Introduction. Literature Survey. Results and Discussion. G. Centi, M. Marella, L. Meregalli, S. Perathoner, M. Tomaselli, and T. La Torretta, Gel Supported Precipitation: An Advanced Method for The Synthesis of Pure and Mixed-Oxide Spheres for Catalytic Applications: Introduction. Brief Survey On The Industrial Preparation Methods of Oxide Carriers for Catalytic Applications. Gel Support Precipitation (GSP) Method. Properties of Oxides Prepared by The GSP Method. Experimental and Apparatus Section. Conclusions. References. T.R. Felthouse, D.A. Berkel, S.R. Jost, E.L. McGrew, and A. Vavere, Platinum-Catalyzed Sulfur Dioxide Oxidation Revisited: Assembly of Acid and Sintering Resistant Honeycomb Washcoat and Catalytically Active Phase Using Sols of Silica, Zirconia, and Platinum: Introduction. Literature Survey. Experimental Section. Results and Discussion. Honeycomb Composition. Conclusions. References. D.R. Milburn, B.D. Adkins, D.E. Sparks, R. Srinivasan, and B.H. Davis, Applications of Supercritical Drying inCatalyst Preparation: Introduction. Results. Conclusions. References. G. Strukul, M. Signoretto, F. Pinna, A. Benedetti, G. Cerrato, and C. Morterra, Aerogel Synthesis as an Improved Method for the Preparation of Platinum Promoted ZirconiaSulfate Catalysts: Introduction. Scope and Applications. Synthesis. Analytical Properties. Structure. Nature of The Active Sites. Catalytic Activity. Conclusion. References. H. Binnemann and W. Broux, Surfactant Stabilized Nanosized Colloidal Metals and Alloys as Catalyst Precursors: Introduction. Survey and Key to the Literature. Results and Discussion. Nanometal Powders from Organosols. Colloidal Alloyed Metals. Catalytic Applications. Experimental. References. K.S. Suslick, T. Hyeon, M. Fang, and A.A. Cichowlas, Sonochemical Preparation of Nanostructured Catalysts: Introduction. Literature Survey. Results and Discussion. Experimental Details. Conclusions. References. G.W. Busser, J.G. Van Ommen, J.A. Lercher, Preparation and Characterization of Polymer Stabilized Rhodium Particles: Introduction. Experimental. Results. Discussion. Conclusions. References. J.Y. Ying, and A. Tschipe, Gas Phase Synthesis of Nonstoichiometric Nanocrystalline Catalysts: Introduction. Gas Phase Synthesis of Nanocrystalline Materials. Nonstoichiometric Nanocrystalline Oxides for Catalytic Oxidation. Summary. References. D.W. Matson, J.C. Linehan, J.G. Darab, M.F. Buehler, M.R. Phelps, G.G. Neuenschwander, A Flow-Through Hydrothermal Method for the Synthesis of Active Nanocrystalline Catalysts: Introduction. The RTDS Powder Synthesis Method and Apparatus. RTDS Products. Summary. References. W.R. Moser, J.E. Sunstrom IV, and B. Marshik-Guerts, The Synthesis of Nanostructure, Pure Phase Catalysts by Hydrodynamic Cavitation: Introduction. High Shear Hydrodynamic Cavitation Equipment. Catalyst Synthesis. Summary and Conclusions. References. M.C. Lovallo and Michael T. Sapatsis, Nanocrystalline Zeolites: Synthesis, Characterization, and Applications with Emphasis On Zeolite L Nanoclusters: Synthesis and Characterization of Zeolite Nanoparticles. Applications with Emphasis on Seeded Growth and Film Formation from Zeolite L Nanoclusters. Conclusions and Directions for Further Development. References. A. Clearfield, Preparation of Pillared Clays and their Catalytic Properties: Introduction. Description of Smectites. The Pillaring Process: Use of the A113 Keggin Ion. Characterization and Properties of A113 Pillared Products. Pilcs Containing Non-Alumina Pillars. Catalytic Properties of Pilcs. Conclusion. References. J. Bonardet, K. Carr, J. Fraissard, G.B. Mcgarvey, J. McMonagle, M. Seay, and J.B. Moffat, Microporous Metal-Oxygen Cluster Compounds (Heteropoly Oxometalates): Synthetic Variables, Nature and Source of the Porosity, Catalytic Applications and Shape Selectivity: Introduction. Historical Background. Structure. Synthesis. Bulk and Surface Properties. Microporosity. References. S. Soled, S. Miseo, G. B. McVicker, J.E. Baumgartner, W.E. Gates, A. Gutierrez, and J. Paes, Preparation of Bulk and Supported Heteropolyacid Salts: Introduction. Experimental. Results and Discussion. Summary. References. J.S. Yoo, J.A. Donohue, C. Choi-Feng, Preparation of Fe/Mo/Molecular Sieves by Chemical Vaper Deposition: Introduction. Experimental. Results and Discussions. Conclusions. References. M. Baerns, S. Termath, and M. Reiche, Chemical Vapor-Phase Deposition and Decomposition Preparation of Metal and Metal Oxide Catalysts in a Fluidized-Bed Reactor: State of the Art. Preparation of Catalysts by Chemical Vapor-Phase Deposition and Decomposition on Support Materials in a Fluidized-Bed Reactor. Introduction. Results. Conclusions. References. A. Wold, Y.-M. Gao, D. Miller, R. Kershaw, and K. Dwight, Synthesis of Catalytic Materials by Spray Pyrolysis: Introduction. Experimental. Results and Discussion. References. P.F. Miquel and J.L. Katz, Formation of Nanostructured Vo-Based Catalysts in Flames: Introduction. Literature Survey. Experimental Setup. Review of Results Obtained to

Date. References. W.R. Moser, J.D. Lennhoff, J.E. Cnossen, K. Fraska, J.W. Schoonover, and J.R. Rozak, The Preparation of Advanced Catalytic Materials by Aerosol Processes; Introduction. Historical Background. Results and Discussion. Potential of Aerosol Processing for Commercial Catalyst Fabrication. Conclusions. References. D. B. Dadyburjor, A.H. Stiller, C.D. Stinespring, A. Jaychadha, D. Tian, Steven B. Martin Jr., and S. Agarwal, Use of an Aerosol Technique to Prepare Iron-Sulfide-Based Catalysts for Direct Coal Liquefaction: Introduction. Background. Preparation. Characterization. Catalytic Performance. Conclusions. References. Index

ISBN: 9780125084604 0125084609 9780080526553 0080526551

Autores: Moser, William R.
