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ELSA MAHONEY

Petrochemical Economics Springer Science & Business Media

This report examines the role of rare earth metals and other materials in the clean energy economy. It was prepared by the U.S. Department of Energy (DoE) based on data collected and research performed during 2010. In the report, DoE describes plans to: (1) develop its first integrated research agenda addressing critical materials, building on three technical workshops convened by the DoE during November and December 2010; (2) strengthen its capacity for information-gathering on this topic; and (3) work closely with international partners, including Japan and Europe, to reduce vulnerability to supply disruptions and address critical material needs. Charts and tables. This is a print on demand report.

Industrial Catalysis McGraw-Hill Prof Med/Tech

This compendium gives an overview of the technologies and economics in the production of olefins in the petrochemical industries. It highlights the options and costs for producing olefins using different technologies and different feedstocks at a time when the cost of carbon dioxide emissions are set to be included in the production cost. Industry professionals, engineers, research scientists and financiers will find this title a valuable resource.

[Rare Earths](#) Springer

These proceedings reflect the important role of catalysis in petroleum refining and the effects of factors such as environmental legislation on the industry. They also show the emergence of significant scientific expertise in the Middle East - the cradle of the oil industry. Participants from all over the world took part in the meeting and the book contains a well-balanced selection of articles from both academia and industry. Current trends in the oil industry focused attention mainly on heavy end hydrotreating, but other processes also gained their share of attention. An invaluable feature of the meeting was the two panel discussions where participants took the opportunity to obtain advance on many real and immediate problems.

[Hydrocarbon Processing](#) Walter de Gruyter GmbH & Co KG

In chemical processes, the progressive deactivation of solid catalysts is a major economic concern and mastering their stability has become as essential as controlling their activity and selectivity. For these reasons, there is a strong motivation to understand the mechanisms leading to any loss in activity and/or selectivity and to find out the efficient preventive measures and regenerative solutions that open the way towards cheaper and cleaner processes. This book covers in a comprehensive way both the fundamental and applied aspects of solid catalyst deactivation and encompasses the state-of-the-art in the field of reactions catalyzed by zeolites. This particular choice is justified by the widespread use of molecular sieves in refining, petrochemicals and organic chemicals synthesis processes, by the large variety in the nature of their active sites (acid, base, acid-base, redox, bifunctional) and especially by their peculiar features, in terms of crystallinity, structural order and textural properties, which make them ideal models for heterogeneous catalysis. The aim of this book is to be a critical review in the field of zeolite deactivation and regeneration, by collecting a series of contributions by experts in the field which describe the factors, explain the techniques to study the causes and suggest methods to prevent (or limit) catalyst deactivation. At the same time, an anthology of commercial processes and exemplar cases provides the reader with theoretical insights and practical hints on the deactivation mechanisms and draws attention to the key role played by the loss of activity on process design and industrial practice.

Chemicals and Fuels from Bio-Based Building Blocks CRC Press

As the importance and dependence of specific mineral commodities increase, so does concern about their supply. The United States is currently 100 percent reliant on foreign sources for 20 mineral commodities and imports the majority of its supply of more than 50 mineral commodities.

Mineral commodities that have important uses and face potential supply disruption are critical to American economic and national security. However, a mineral commodity's importance and the nature of its supply chain can change with time; a mineral commodity that may not have been considered critical 25 years ago may be critical today, and one considered critical today may not be so in the future. The U.S. Geological Survey has produced this volume to describe a select group of mineral commodities currently critical to our economy and security. For each mineral commodity covered, the authors provide a comprehensive look at (1) the commodity's use; (2) the geology and global distribution of the mineral deposit types that account for the present and possible future supply of the commodity; (3) the current status of production, reserves, and resources in the United States and globally; and (4) environmental considerations related to the commodity's production from different types of mineral deposits. The volume describes U.S. critical mineral resources in a global context, for no country can be self-sufficient for all its mineral commodity needs, and the United States will always rely on global mineral commodity supply chains. This volume provides the scientific understanding of critical mineral resources required for informed decisionmaking by those responsible for ensuring that the United States has a secure and sustainable supply of mineral commodities.

[Rare Earth](#) Royal Society of Chemistry

High-technology and environmental applications of the rare-earth elements (REE) have grown dramatically in diversity and importance over the past four decades. This book provides a scientific understanding of rare earth properties and uses, present and future. It also points the way to efficient recycle of the rare earths in end-of-use products and efficient use of rare earths in new products. Scientists and students will appreciate the book's approach to the availability, structure and properties of rare earths and how they have led to myriad critical uses, present and future. Experts should buy this book to get an integrated picture of production and use (present and future) of rare earths and the science behind this picture. This book will prove valuable to non-scientists as well in order to get an integrated picture of production and use of rare earths in the 21st Century, and the science behind this picture. - Defines the chemical, physical and structural properties of rare earths. - Gives the reader a basic understanding of what rare earths can do for us. - Describes uses of each rare earth with chemical, physics, and structural explanations for the properties that underlie those uses. - Allows the reader to understand how rare earths behave and why they are used in present applications and will be used in future applications. - Explains to the reader where and how rare earths are found and produced and how they are best recycled to minimize environmental impact and energy and water consumption.

[Engineering Catalysis](#) World Scientific

The book discusses the sciences of operations, converting raw materials into desired products on an industrial scale by applying chemical transformations and other industrial technologies. Basics of chemical technology combining chemistry, physical transport, unit operations and chemical reactors are thoroughly prepared for an easy understanding.

Fluid Catalytic Cracking CRC Press

This monograph represents a tribute to the late Prof. Karl Gschneidner, well known as "Mr. Rare Earth", distinguished Professor of Materials Science and Engineering at the Iowa State University, a Senior Metallurgist at the Ames Laboratory, and the Chief Scientist of the Critical Materials Institute. Topics covered include Rare Earth Glass Spectroscopy, Treating Skin Diseases, Prospective Rare Earth Applications, Optical Information Storage, Diagnostic Imaging, Nanoparticles in Glasses, and ZnO Nanomaterials.

[Catalytic Hydrogenation over Platinum Metals](#) Elsevier

An up-to-date and two volume overview of recent developments in the field of chemocatalytic and enzymatic processes for the transformation of renewable material into essential chemicals and fuels. Experts from both academia and industry discuss catalytic processes currently under development as well as those already in commercial use for the production of bio-fuels and bio-

based commodity chemicals. As such, they cover drop-in commodity chemicals and fuels, as well as bio-based monomers and polymers, such as acrylic acid, glycols, polyesters and polyolefins. In addition, they also describe reactions applied to waste and biomass valorization and integrated biorefining strategies. With its comprehensive coverage of the topic, this is an indispensable reference for chemists working in the field of catalysis, industrial chemistry, sustainable chemistry, and polymer synthesis.

[Industrial Catalysis](#) Editions TECHNIP

The need to improve both the efficiency and environmental acceptability of industrial processes is driving the development of heterogeneous catalysts across the chemical industry, including commodity, specialty and fine chemicals and in pharmaceuticals and agrochemicals. Drawing on international research, Supported Catalysts and their Applications discusses aspects of the design, synthesis and application of solid supported reagents and catalysts, including supported reagents for multi-step organic synthesis; selectivity in oxidation catalysis; mesoporous molecular sieve catalysts; and the use of Zeolite Beta in organic reactions. In addition, the two discrete areas of heterogeneous catalysis (inorganic oxide materials and polymer-based catalysts) that were developing in parallel are now shown to be converging, which will be of great benefit to the whole field. Providing a snapshot of the state-of-the-art in this fast-moving field, this book will be welcomed by industrialists and researchers, particularly in the agrochemicals and pharmaceuticals industries.

[Catalysis and Zeolites](#) John Wiley & Sons

With a focus on actual industrial processes, e.g. the production of light alkenes, synthesis gas, fine chemicals, polyethylene, it encourages the reader to think "out of the box" and invent and develop novel unit operations and processes. Reflecting today's emphasis on sustainability, this edition contains new coverage of biomass as an alternative to fossil fuels, and process intensification. The second edition includes: New chapters on Process Intensification and Processes for the Conversion of Biomass Updated and expanded chapters throughout with 35% new material overall Text boxes containing case studies and examples from various different industries, e.g. synthesis loop designs, Sasol I Plant, Kaminsky catalysts, production of Ibuprofen, click chemistry, ammonia synthesis, fluid catalytic cracking Questions throughout to stimulate debate and keep students awake! Richly illustrated chapters with improved figures and flow diagrams Chemical Process Technology, Second Edition is a comprehensive introduction, linking the fundamental theory and concepts to the applied nature of the subject. It will be invaluable to students of chemical engineering, biotechnology and industrial chemistry, as well as practising chemical engineers. From reviews of the first edition: "The authors have blended process technology, chemistry and thermodynamics in an elegant manner... Overall this is a welcome addition to books on chemical technology." - The Chemist "Impressively wide-ranging and comprehensive... an excellent textbook for students, with a combination of fundamental knowledge and technology." - Chemistry in Britain (now Chemistry World)

[Catalytic Cracking of Heavy Petroleum Fractions](#) Materials Research Forum LLC

Since the late 1970s there has been an explosion of industrial and academic interest in circulating fluidized beds. In part, the attention has arisen due to the environmental advantages associated with CFB (circulating fluidized bed) combustion systems, the incorporation of riser reactors employing circulating fluidized bed technology in petroleum refineries for fluid catalytic cracking and, to a lesser extent, the successes of CFB technology for calcination reactions and Fischer-Tropsch synthesis. In part, it was also the case that too much attention had been devoted to bubbling fluidized beds and it was time to move on to more complex and more advantageous regime, S of operation. Since 1980 a number of CFB processes have been commercialized. There have been five successful International Circulating Fluidized Bed Conferences beginning in 1985, the most recent taking place in Beijing in May 1996. In addition, we have witnessed a host of other papers on CFB fundamentals and applications in journals and other archival publications. There

have also been several review papers and books on specific CFB topics. However, there has been no comprehensive book reviewing the field and attempting to provide an overview of both fundamentals and applications. The purpose of this book is to fill this vacuum.

Supported Catalysts and Their Applications John Wiley & Sons

Applied Industrial Catalysis, Volume 1 provides a practical description of catalysis by industrial scientists. This book provides information pertinent to industrial catalysis, which is influenced by science, business, economic, markets, and politics. Organized into 10 chapters, this volume starts with an overview of the significance of industrial catalysis and its effect on human lifestyle and environment. This text then describes how to take a laboratory catalyst to successful commercialization with minimum problems. Other chapters consider in detail two major refinery processes, namely, hydrotreating and reforming. The reader is introduced to the specific processes for polyethylene and polypropylene manufacture. This book reviews as well ethylene oxide synthesis and explains oxychlorination of ethylene to ethylene dichloride. The final chapter reviews methanol carbonylation to acetic acid, which is produced by continuously reacting methanol and carbon monoxide in a homogeneous catalytic reactor at

Handbook of Petroleum Processing Geological Survey

Advances in Catalysis fills the gap between the journal papers and textbooks across the diverse areas of catalysis research. For more than 60 years, this series has been dedicated to recording progress in the field of catalysis, providing the scientific community with comprehensive and authoritative reviews. This series is an invaluable and comprehensive resource for chemical engineers and chemists working in the field of catalysis in both academia and industry. - Authoritative reviews written by experts in the field - Topics selected reflect progress in the field and include catalyst synthesis, catalyst characterization, catalytic chemistry, reaction engineering, computational chemistry, and physics - Insightful and critical articles, fully edited to suit various backgrounds

Crude Oil Refining John Wiley & Sons

With well over 90% of all processes in the industrial chemical production being of catalytic nature, catalysis is a mature though ever interesting topic. The idea of this book is to tackle various aspects of heterogeneous catalysis from the engineering point of view and go all the way from engineering of catalysis, catalyst preparation, characterization, reaction kinetics, mass transfer to catalytic reactors and the implementation of catalysts in chemical technology. Aimed for graduate students it is also a useful resource for professionals coming from the more academic side.

Chemical Reaction Technology John Wiley & Sons

To meet changing market demands that have stringent emission standards and to ensure proper performance in refinery units, evaluation of novel catalyst designs and results from material characterization and testing of catalysts are of crucial importance for refiners as well as for catalyst manufacturers. This book highlights recent developments in the application of refinery catalysts in selected units such as fluid catalytic cracking (FCC), hydrogen production for hydroprocessing units, hydrotreating, hydrocracking, and sustainable processing of biomass into biofuels.

Catalysts in Petroleum Refining 1989 Springer

This book is devoted to the new development of zeolitic catalysts with an emphasis on new strategies for the preparation of zeolites, novel techniques for their characterization and emerging applications of zeolites as catalysts for sustainable chemistry, especially in the fields of energy, biomass conversion and environmental protection. Over the years, energy and the environment have become the most important global issues, while zeolitic catalysts play important roles in addressing them. With individual chapters written by leading experts, this book offers an essential reference work for researchers and professionals in both academia and industry. Feng-Shou Xiao is a Professor at the Department of Chemistry, Zhejiang University, China. Xiangju Meng is an Associate Professor at the Department of Chemistry, Zhejiang University, China.

Rare Earth Metals and Minerals Industries Academic Press

Catalytic Hydrogenation over Platinum Metals focuses on catalytic hydrogenation as an effective process in attaining controlled transformations of organic compounds. Composed of contributions of various authors, the book first provides information on catalysts, equipment, and conditions. Catalyst stability and reuse; types of catalyst; platinum metals; and synergism are covered. The text proceeds with discussions on hydrogenation reactors. Topics include atmospheric pressure reactors; low pressure reactors; microreactors; and high pressure reactors. The book also covers hydrogenation of carbon-carbon unsaturation. Catalytic metal; modified catalyst systems; stereochemistry; diacetylenes; and hydrogenolysis are discussed. The text also looks at the hydrogenation of aromatics, nitrogen and carbonyl compounds, and hydrogenolysis. Numerical representations and analysis, diagrams, and reactions of compounds when exposed to different laboratory conditions are considered. The selection is a great source of data for readers interested in studying the process of catalytic hydrogenation.

Zeolites in Catalysis Elsevier

This text examines the thermal and catalytic processes involved in the refining of petroleum including visbreaking, coking, pyrolysis, catalytic cracking, oligomerization, alkylation, hydrofining, hydroisomerization, hydrocracking, and catalytic reforming. It analyzes the thermodynamics, reaction mechanisms, and kinetics of each process, as well as

Advances in Refining Catalysis John Wiley & Sons

Includes topics not found together in books on petroleum processing: economics, automation, process modeling, online optimization, safety, environmental protection Combines overviews of petroleum composition, refinery processes, process automation, and environmental protection with comprehensive chapters on recent advances in hydroprocessing, FCC, lubricants, hydrogen management Gives diverse perspectives, both geographic and topical, because contributors include experts from eight different countries in North America, Europe and Asia, representing oil companies, universities, catalyst vendors, process licensors, consultants and engineering contractors