Catalysts in Petroleum Refining and Petrochemical Industries 1995-
M. Absi-Halabi 1996-01-15 Catalysis plays an increasingly critical role in modern petroleum refining and basic petrochemical industries as market demands for and specifications of petroleum and petrochemical products are continuously changing. As we enter the 21st century, new challenges for catalysis science and technology are anticipated in almost every field. Particularly, better utilization of petroleum resources and demands for cleaner transportation fuels are major items. It was against this background that the 2nd International Conference on Catalysts in Petroleum Refining and Petrochemical Industries was organized. The conference was attended by around 300 specialists in the catalysis field from both academia and industry from over 30 countries. It provided a forum for the exchange of ideas between scientists and engineers from the region with their counterparts from industrialized countries. The papers from the conference, which were carefully selected from around 100 submissions, were refereed in terms of scientific and technical content and format in accordance with internationally accepted standards. They comprise a mix of reviews providing an overview of selected areas, original fundamental research results, and industrial experiences.

Catalysis in Petroleum and Petrochemical Industries-Krishna G. Bhattacharyya 2005 Focuses on the use of catalysis in the Oil Refineries and in the Petrochemical Industries with particular reference to understanding the basic processes, development of appropriate catalysts, their characterization techniques, and laboratory scale studies on important chemical reactions having relevance to the Petroleum Industry.

Advanced Catalysis Processes in Petrochemicals and Petroleum Refining: Emerging Research and Opportunities-Al-Kinany, Mohammed C. 2019-08-16 Petroleum refining and the petrochemical industry play an important role in the current world economy. They provide the platform to convert basic raw materials into many essential products, ranging from transportation fuels (such as gasoline, jet fuel, diesel, and gas oil) to basic and intermediate materials for petrochemical industries and many other valuable chemical products. Advanced Catalysis Processes in Petrochemicals and Petroleum Refining: Emerging Research and Opportunities is an essential comprehensive research publication that provides knowledge on refining processes that could be integrated by the petrochemical industry and discusses how to integrate refining products with petrochemical industries through the use of new technologies.
Featuring a range of topics such as biofuel production, environmental sustainability, and biorefineries, this book is ideal for engineers, chemists, industry professionals, policymakers, researchers, academicians, and petrochemical companies.

**Encyclopaedia of Catalysis in Petroleum and Petrochemical Industries** - Santino Quinn 2012-09 This book focuses on the use of catalysis in the oil refineries and in the petrochemical industries with particular reference to understanding the basic processes, development of appropriate catalysts and their characterization techniques.

**Catalysis in Petrochemical Processes** - M.S. Matar 2012-12-06 The field of petrochemicals started some years ago with the simple addition reaction of water to propylene for the production of isopropyl alcohol. Currently, the petrochemical industry has become a multi-billion dollar enterprise which encompasses a wide field of chemical products. Almost all the basic organic reactions such as hydrogenation, alkylation, substitution, polymerization, etc. are utilized for the production of these chemicals. It may not, however, have been possible to establish this huge industry without the use of different catalysts. In other words, the great advancements in the catalytic area have supported the vast developments in the petrochemical field. In this book, we have adopted the idea of discussing the petrochemical industry from the point of view of reactants' activities and susceptibilities toward different catalysts. The book is thus classified according to the reaction type. This will enable students and other users of the book to base their understanding of the petrochemical field on the fundamental principles learned in chemistry. However, the first chapter is aimed at establishing some basic facts on the petrochemical industry and its major uses. It discusses, without going into details, the raw materials used, the intermediates and the downstream products. The next eight chapters discuss in some detail the main reactions and the catalysts used for the production of chemicals and polymers from petroleum. The last chapter is devoted to a discussion of some of the practical techniques used in the catalytic field.

**Proceedings of the National Workshop on Catalysis in Petroleum and Petrochemical Industries** - Catalysis Society of India 1983

**Catalysis in Petroleum and Petrochemical Industries** - Ram Naresh Agrawal 2017

**Petrochemical Catalyst Materials, Processes, and Emerging Technologies** - Hamid Al-Megren 2016-02-05 "This book addresses the latest research on emerging technological applications, catalyst materials for fuel upgrading, in addition to safety concerns and considerations within the petrochemical industry"--


**The Refinery of the Future** - James G. Speight 2010-12-21 As feedstocks to refineries change, there must be an accompanying change in refinery technology. This means a movement from conventional means of refining heavy feedstocks using (typically) coking technologies to more innovative processes that will coax the last drips of liquid fuels from the feedstock. This book presents the evolution of refinery processes during the last century and as well as the means by which refinery processes will evolve during the next three-to-five decades. Chapters contain material relevant to (1) comparisons of current feedstocks with heavy oil and bio-feedstocks; (2) evolution of refineries since the 1950s, (3) properties and refinability of heavy oil and bio-feedstocks, (4) thermal processes vs. hydroprocesses, and (5) evolution of products to match the environmental market. Process innovations that have influenced refinery processing over the past three decades are presented, as well as the relevant patents that have the potential for incorporation into future refineries. • Comparison of current feedstocks with heavy oil and bio-feedstocks. • Evolution of refineries over the past three decades. • Properties and refinability of heavy oil and bio-
feedstocks. • Thermal processes vs. Hydroprocesses. • Evolution of products to match the environmental market. Investigates the engineering and plant design challenges presented by heavy oil and bio-feedstocks
Explores the legislative and regulatory climate, including increasingly stringent environmental requirements Examines the trade-offs of thermal processes vs. hydroprocesses

Petrochemical Catalyst Materials, Processes, and Emerging Technologies-Al-Megren, Hamid 2016-02-17

Modeling and Simulation of Catalytic Reactors for Petroleum Refining-Jorge Ancheyta 2011-04-20 Modeling and Simulation of Catalytic Reactors for Petroleum Refining deals with fundamental descriptions of the main conversion processes employed in the petroleum refining industry: catalytic hydrotreating, catalytic reforming, and fluid catalytic cracking. Common approaches for modeling of catalytic reactors for steady-state and dynamic simulations are also described and analyzed. Aspects such as thermodynamics, reaction kinetics, process variables, process scheme, and reactor design are discussed in detail from both research and commercial points of view. Results of simulation with the developed models are compared with those determined at pilot plant scale as well as commercial practice. Kinetics data used in the reactor model are either taken from the literature or obtained under controlled experiments at the laboratory.

Deactivation and Poisoning of Catalysts-J. Oudar 1985-07-02
Deactivation and Poisoning of Catalysts presents the most current research in the area of heterogeneous catalysis. It focuses on the chemically induced effects associated with bonded surface species that cause catalyst activity decline -- and in some cases a change in catalyst specificity. In addition, this volume examines poisoning of dispersed metal catalysts ... the thermodynamics of sulfur-metal and carbon-metal interactions ... model poisoning reactions on single crystals ... deactivation in petroleum refining and petrochemical processes ... coking of metal catalysts ... and more. The new approaches and solutions to catalyst deactivation and poisoning presented in this guide are invaluable to all heterogeneous catalysis specialists, including chemical and petroleum engineers, and surface, synthetic, physical, and industrial chemists. Book jacket.


Proceedings of the Second National Workshop on Catalysis in Petroleum and Petrochemical Industries-Catalysis Society of India 1983*

Petrochemistry-Martin Bajus 2020-03-02 A comprehensive textbook on petrochemical conversion processes for petroleum and natural gas fractions as produced by refinery operations. This innovative textbook provides...
essential links between the chemical sciences and chemical technology, between petrochemistry and hydrocarbon technology. The book brings alive key concepts forming the basis of chemical technology and presents a solid background for innovative process development. In all chapters, the processes described are accompanied by simplified flow schemes, encouraging students to think in terms of conceptual process designs.

Petrochemistry: Petrochemical Processing, Hydrocarbon Technology and Green Engineering introduces students to a variety of topics related to the petrochemical industry, hydrocarbon processing, fossil fuel resources, as well as fuels and chemicals conversion. The first chapter covers the fundamentals and principals for designing several of the processes in the book, including discussions on thermodynamics, chemical kinetics, reactor calculations, and industrial catalysts. The following chapters address recent advances in hydrocarbon technology, energy technology, and sources of hydrocarbons. The book then goes on to discuss the petrochemical industry based on four basic pillars, all derived from petroleum and natural gas: Production of lower alkenes; other sources of lower alkenes; petrochemicals from C2-C3 alkenes Production of BTX aromatics; chemicals from BTX aromatics C1 technology Diversification of petrochemicals. The growing importance of sustainable technology, process intensification and addressing greenhouse gas emissions is reflected throughout the book. Written for advanced students working in the areas of petrochemistry, hydrocarbon technology, natural gas, energy materials and technologies, alternative fuels, and recycling technologies the book is also a valuable reference for industrial practitioners in the oil and gas industry.

Catalysis Looks to the Future· National Research Council 1992-02-01 The impact of catalysis on the nation's economy is evidenced by the fact that catalytic technologies generate U.S. sales in excess of $400 billion per year and a net positive balance of trade of $16 billion annually. This book outlines recent accomplishments in the science and technology of catalysis and summarizes important likely challenges and opportunities on the near horizon. It also presents recommendations for investment of financial and human resources by industry, academe, national laboratories, and relevant federal agencies if the nation is to maintain continuing leadership in this field— one that is critical to the chemical and petroleum processing industries, essential for energy-efficient means for environmental protection, and vital for the production of a broad range of pharmaceuticals.

Springer Handbook of Petroleum Technology· Chang Samuel Hsu 2017-12-20 This handbook provides a comprehensive but concise reference resource for the vast field of petroleum technology. Built on the successful book "Practical Advances in Petroleum Processing" published in 2006, it has been extensively revised and expanded to include upstream technologies. The book is divided into four parts: The first part on petroleum characterization offers an in-depth review of the chemical composition and physical properties of petroleum, which determine the possible uses and the quality of the products. The second part provides a brief overview of petroleum geology and upstream practices. The third part exhaustively discusses established and emerging refining technologies from a practical perspective, while the final part describes the production of various refining products, including fuels and lubricants, as well as petrochemicals, such as olefins and polymers. It also covers process automation and real-time refinery-wide process optimization. Two key chapters provide an integrated view of petroleum technology, including environmental and safety issues. Written by international experts from academia, industry and research institutions, including integrated oil companies, catalyst suppliers, licensors, and consultants, it is an invaluable resource for researchers and graduate students as well as practitioners and professionals.

Processing of Heavy Crude Oils· Ramasamy Marappa Gounder 2019-12-18

Heterogeneous Catalysis for Energy Applications· Tomas R Reina 2020-08-27 Heterogeneous catalysis plays a central role in the global energy paradigm, with practically all energy-related process relying on a catalyst at a certain point. The application of heterogeneous catalysts will be of paramount importance to achieve the transition towards low carbon and sustainable societies. This book provides an overview of the design, limitations and challenges of heterogeneous catalysts for energy applications. In an attempt to cover a broad spectrum of scenarios, the book
Practical Advances in Petroleum Processing-Chang Samuel Hsu  
2007-01-10 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

Zeolites for Cleaner Technologies-Michel Guisnet 2002-09-19 This book, written and edited by leading authorities from academia and industrial groups, covers both preventive- and curative-zeolite-based technologies in the field of chemical processing. The opening chapter presents the state of the art in zeolite science. The two subsequent chapters summarize the chemistries involved in the processes and the constraints imposed on the catalyst/adsorbent. Three major areas are covered: oil refining, petrochemicals and fine chemicals. A chapter on the (curative) use of zeolites in pollution abatement completes this overview. In the area of oil refining, a general lecture sets the scene for present and future challenges. It is followed by in-depth case studies involving FCC, hydrocracking and light naphtha isomerization. Also, an entire chapter is devoted to the often-overlooked subject of base oils. In the area of petrochemicals, the processing of aromatics and olefins is described and special attention is paid to the synergy between catalysis and separation on molecular sieves. Contents:Introduction to Zeolite Science and Technology (M Guisnet & J-P Gilson)The Chemistry of Catalytic Processes (A Corma & A Martínez)Preparation of Zeolite Catalysts (T G Roberie et al.)Refining Processes: Setting the Scene (R H Jensen)Advances in Fluid Catalytic Cracking (E T Habib et al.)Hydrocracking (J A R Van Veen)C4-C6 Alkane Isomerisation (F Schmidt & E Köhler)Base Oil Production and Processing (M Daage)Para-Xylene ManufacturingCatalytic Reactions and Processes (F Alario & M Guisnet)Separation of Paraxylene by Adsorption (A Méthivier)Aromatic Alkylation: Towards Cleaner Processes (J S Beck et al.)Methanol to Olefins (MTO) and Beyond (P Barger)Zeolite Effects on Catalytic Transformations of Fine Chemicals (D E De Vos & P A Jacobs)Functionalization of Aromatics over Zeolite Catalysts (P Marion et al.)Zeolites and ‘Non-Zeolite’ Molecular Sieves in the Synthesis of Fragrances and Flavors (W F Hoelderich & M C Laufer)Pollution Abatement Using Zeolites: State of the Art and Further Needs (G Delahay & B Coq)Readership: Undergraduates, graduate students, academics and researchers in catalyst chemistry. Reviews: “Chapter authors have provided a teaching text that gives excellent introductory chapters to zeolites, and to the nature and significance of the processes that they can catalyse ... This excellent book should be required reading for all scientists who have an interest in improving the environment.”Chemistry & Industry

Fischer-Tropsch Synthesis, Catalysts, and Catalysis-Burtron H. Davis 2016-04-06 With petroleum prices spiraling upward, making synthetic fuels- or "synfuels"- from coal, natural gas, and biomass has become more economically competitive. Advanced energy companies now focus exclusively on alternative fuels, and many oil companies have programs dedicated to developing synthetic fuels. The Fischer-Tropsch process, which uses a colle

Base Metal Oxide Catalysis-John Happel 1977

Chromium & Vanadium Supported Catalysts of Butane
Dehydrogenation-Babajide Ajayi 2020-07-22 To realize better economic benefits in the petrochemical industry, conversion of lower hydrocarbons such as C1 to C4 alkanes to higher value products should be investigated. This book focuses on research efforts in this direction, investigating new processes with higher efficiencies and better economic returns than current commercial processes. The abundance and lower cost of light alkanes have generated extraordinary interest in oxidative catalytic conversion of alkanes to olefins, oxygenates or nitriles in the petroleum and petrochemical industries due to both the potential economic and environmental advantages. The direct conversion of light alkanes to commodity chemical intermediates has the potential to radically transform the chemical industry. The effectiveness of the catalyst, that is the activity for alkane conversion and the selectivity to desired products, will ultimately determine the economic attractiveness of an alkane-based chemical process.

Handbook of Petroleum Processing-Steven A Treese 2015-08-04 This extensively updated second edition of the already valuable reference targets research chemists and engineers who have chosen a career in the complex and essential petroleum industry, as well as other professionals just entering the industry who seek a comprehensive and accessible resource on petroleum processing. The handbook describes and discusses the key components and processes that make up the petroleum refining industry. Beginning with the basics of crude oils and their nature, it continues with the commercial products derived from refining and with related issues concerning their environmental impact. More in depth coverage of many topics previously covered in the first edition, such as hydraulic fracturing or fracking as it is often termed, help ensure this reference remains a relevant and up-to-date resource. At its core is a complete overview of the processes that make up a modern refinery, plus a brief history of the development of petroleum refining, plus appendices supplying data such as converging factors and selected crude oil assays, as well as an example of optimizing a refinery configuration using linear programming are all included to aid the reader. The 2nd edition of the Handbook of Petroleum Processing is an indispensable desk reference for chemists and engineers as well as an essential part of the libraries of universities with a chemical engineering faculty and oil refiners and engineering firms performing support functions or construction.

The Changing Landscape of Hydrocarbon Feedstocks for Chemical Production-National Academies of Sciences, Engineering, and Medicine 2016-12-10 A decade ago, the U.S. chemical industry was in decline. Of the more than 40 chemical manufacturing plants being built worldwide in the mid-2000s with more than $1 billion in capitalization, none were under construction in the United States. Today, as a result of abundant domestic supplies of affordable natural gas and natural gas liquids resulting from the dramatic rise in shale gas production, the U.S. chemical industry has gone from the world’s highest-cost producer in 2005 to among the lowest-cost producers today. The low cost and increased supply of natural gas and natural gas liquids provides an opportunity to discover and develop new catalysts and processes to enable the direct conversion of natural gas and natural gas liquids into value-added chemicals with a lower carbon footprint. The economic implications of developing advanced technologies to utilize and process natural gas and natural gas liquids for chemical production could be significant, as commodity, intermediate, and fine chemicals represent a higher-economic-value use of shale gas compared with its use as a fuel. To better understand the opportunities for catalysis research in an era of shifting feedstocks for chemical production and to identify the gaps in the current research portfolio, the National Academies of Sciences, Engineering, and Medicine conducted an interactive, multidisciplinary workshop in March 2016. The goal of this workshop was to identify advances in catalysis that can enable the United States to fully realize the potential of the shale gas revolution for the U.S. chemical industry and, as a result, to help target the efforts of U.S. researchers and funding agencies on those areas of science and technology development.
that are most critical to achieving these advances. This publication summarizes the presentations and discussions from the workshop.

**Heterogeneous Catalysis** - Sirirat Jitkarnka 2009

**Homogeneous Catalysis** - Sumit Bhaduri 2014-09-08 Over the last decade, the area of homogeneous catalysis with transition metal has grown in great scientific interest and technological promise, with research in this area earning three Nobel Prizes and filing thousands of patents relating to metallocene and non-metallocene single site catalysts, asymmetric catalysis, carbon-carbon bond forming metathesis and cross coupling reactions. This text explains these new developments in a unified, cogent, and comprehensible manner while also detailing earlier discoveries and the fundamentals of homogeneous catalysis. Serving as a self-study guide for students and all chemists seeking to gain entry into this field, it can also be used by experienced researchers from both academia and industry for referring to leading state of the art review articles and patents, and also as a quick self-study manual in an area that is outside their immediate expertise. The book features: • Topics including renewable feed stocks (biofuel, glycerol), carbon dioxide based processes (polycarbonates), fluorous solvents, ionic liquid, hydroformylation, polymerization, oxidation, asymmetric catalysis, and more • Basic principles of organometallic chemistry, homogeneous catalysis, and relevant technological issues • Problems and answers, industrial applications (case studies), and examples from proven industrial processes with clear discussions on environmental and techno-commercial issues • Extensive references to cutting edge research with application potential and leading patents • Tables and illustrations to help explain difficult concepts.

**Thermal and Catalytic Processes in Petroleum Refining** - Serge Raseev 2003-02-26 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

**The Role of Rare Earths in Catalysis** - Karl A. Gschneidner 2000 Among the numerous applications of the rare-earth elements, the field of catalysis accounts for a large number. Catalysis represents approximately 20% of the total market sales of rare earths worldwide. As a matter of fact two main applications have been prominent in the last decades: zeolite stabilization for fluid cracking catalysts, and automotive post-combustion catalytic treatment. The oldest use of rare earths in catalysis deals with the structural and chemical stabilization of the zeolites for petroleum cracking applications. For a long time this has been an area of application for non-separated rare earths. The addition of several percent of rare earths in the pores of the zeolite results in a strong surface acidity, which is essential for an efficient conversion of high-weight molecules into lighter species, like low-octane fuel, even in the very aggressive conditions of the petroleum industry. The popular demand for high-quality air in spite of the traffic congestion in large cities resulted in larger and larger constraints in the emission exhaust from cars. Thus highly efficient catalysts have had to be designed, and due to the combination of its redox properties and very good thermal stability, cerium oxide has been since the beginning, early in the 1980s, a major component of the three-way catalysts (TWC) now used in all modern gasoline cars. The future of rare earths in catalysis is probably bright. The fact that approximately 400 patents are applied for yearly in the area since 1992 is an illustration of a very active area. Usage of rare earths in catalysis is expected to grow due to their highly specific properties. Instead of the physical properties used in electronic applications, one deals now with redox properties, water and thermal stability, coordination numbers and so forth. The rare earths are so specific in these properties that their use can hardly be avoided, not only for the beauty of academic studies but also for the development of industrial applications with immediate influence on everyday life. Careful control of the synthesis conditions and the definition of optimum composition in each case are the keys to the preparation of highly performing compounds for catalytic applications. They must actually be considered as high performance products with functional properties, and not just chemical species. Chapters devoted primarily to catalysis have been published in earlier volumes of the...
Handbook. In this volume several more are added. The first is an extension of the earlier chapter 43, on interactions at surfaces of metals and alloys, to reactions such as hydrogenation, methanation, ammonia synthesis, saturated hydrocarbon reactions, dehydrogenation of hydrogenated materials, hydrosulfurization, and carbon monoxide oxidation. The second chapter reports on the wide variety of catalyzed reactions involving metals and alloys in the innovated form of metal overlayers or bimetallic compounds with some transition metals produced from ammonia solutions. This is followed by a chapter on catalysis with mixed oxides usually having perovskite or perovskite-related structures. Then follows a comprehensive discussion on the background and current role of cerium oxide and associated materials for post-treatment of exhaust gases for pollution control. These three-way catalysts (TWC) are designed to render harmless the CO, NOx, and unburned hydrocarbons from internal combustion engines. The next chapter considers the wide field of zeolite catalysts containing rare earths from their historic use in petroleum refining in the 1960s to other petrochemical and fine chemical applications today. The final chapter documents the use of the triflates (the trifluoro-methane-sulfonyl group which is a hard Lewis acid in both aqueous and organic solutions) as versatile catalysts in carbon-carbon bond-forming reactions. Their stability in the presence of water, in spite of their being hard Lewis acids, enhances their growing usefulness.

Petroleum Refining Design and Applications Handbook - A. Kayode Coker 2018-08-09 There is a renaissance that is occurring in chemical and process engineering, and it is crucial for today’s scientists, engineers, technicians, and operators to stay current. With so many changes over the last few decades in equipment and processes, petroleum refining is almost a living document, constantly needing updating. With no new refineries being built, companies are spending their capital re-tooling and adding on to existing plants. Refineries are like small cities, today, as they grow bigger and bigger and more and more complex. A huge percentage of a refinery can be changed, literally, from year to year, to account for the type of crude being refined or to integrate new equipment or processes. This book is the most up-to-date and comprehensive coverage of the most significant and recent changes to petroleum refining, presenting the state-of-the-art to the engineer, scientist, or student. Useful as a textbook, this is also an excellent, handy go-to reference for the veteran engineer, a volume no chemical or process engineering library should be without. Written by one of the world’s foremost authorities, this book sets the standard for the industry and is an integral part of the petroleum refining renaissance. It is truly a must-have for any practicing engineer or student in this area.

Petroleum and Petrochemical Engineering - Andy Margo 2016-05-27 Petroleum and petrochemical engineering is an emerging field aimed at production of fuels, natural gases and petrochemicals. There has been a tremendous surge in the last few decades for exploration of new hydrocarbon deposits as well as improving the refining and distillation processes for maximum recovery of crude deposits from the reservoirs. It is a multidisciplinary field that includes concepts and technological aspects of geological, mechanical, civil and chemical engineering. This book provides an in-depth explanation of the various processes involved in petroleum and petrochemical engineering such as drilling, processing and technical analysis of petrochemicals. Some of the significant topics included in this book are design of petroleum plants and reservoirs, catalysis and synthesis of petrochemicals, reaction engineering, etc. Students, researchers, experts and engineers associated with petroleum engineering will benefit alike from this book.

Chemistry of Zeolites and Related Porous Materials - Ruren Xu 2009-05-29 Widely used in adsorption, catalysis and ion exchange, the family of molecular sieves such as zeolites has been greatly extended and many advances have recently been achieved in the field of molecular sieves synthesis and related porous materials. Chemistry of Zeolites and Related Porous Materials focuses on the synthetic and structural chemistry of the major types of molecular sieves. It offers a systematic introduction to and in-depth discussion of microporous, mesoporous, and macroporous materials and also includes metal-organic frameworks. Provides focused coverage of the key aspects of molecular sieves. Features two frontier subjects: molecular engineering and host-guest advanced materials. Comprehensively covers both theory and application with particular emphasis on industrial uses. This book is essential reading for researchers in the chemical and materials industries and research institutions. The book is...
also indispensable for researches and engineers in R&D (for catalysis) divisions of companies in petroleum refining and the petrochemical and fine chemical industries.

Catalyst Immobilization - Maurizio Benaglia 2020-02-10 A comprehensive resource on techniques and applications for immobilizing catalysts. Catalyst Immobilization: Methods and Applications covers catalyst immobilization topics including technologies, materials, characterization, chemical activity, and recyclability. The book also presents innovative applications for supported catalysts, such as flow chemistry and machine-assisted organic synthesis. Written by an international panel of expert contributors, this book outlines the general principles of catalyst immobilization and explores different types of supports employed in catalyst heterogenization. The book’s chapters examine the immobilization of chiral organocatalysts, reactions in flow reactors, 3D printed devices for catalytic systems, and more. Catalyst Immobilization offers a modern vision and a broad and critical view of this exciting field. This important book: - Offers a guide to supported and therefore recyclable catalysts, which is one of the most important tools for developing a highly sustainable chemistry - Presents various immobilization techniques and applications - Explores new trends, such as 3D printed devices for catalytic systems - Contains information from a leading international team of authors Written for catalytic chemists, organic chemists, process engineers, biochemists, surface chemists, materials scientists, analytical chemists, Catalyst Immobilization: Methods and Applications presents the latest developments and includes a review of the innovative trends such as flow chemistry, reactions in microreactors, and beyond.

FineCat 2013 - Symposium on heterogeneous catalysis for fine chemicals - Book of Abstract 2013-04-29 The Book of Abstract of the second "FineCat - Symposium on heterogeneous catalysis for fine chemicals" held in Italy on April 2013, including the lectures of eminent chemists Claudio Bianchini, D. Tyler McQuade and Elio Santacesaria. A not-to-be-missed resource to stay updated by reviewing exciting chemical innovation in fields as diverse as glycerol and biodiesel conversion, flow chemistry with solid catalysts, catalysis with metal nanoparticles, heterogeneous photocatalysis and doped hybrid silicas. Delegates from Germany, the US, Israel, Thailand, Kazakhstan, Italy, Kuwait and Qatar pointed once again to the truly international nature of this Symposium series inaugurated in 2012.

Planning and Integration of Refinery and Petrochemical Operations - Khalid Y. Al-Qahtani 2011-03-16 Clearly divided into three main sections, this practical book familiarizes readers with the area of planning in petroleum refining and petrochemical industry, while introducing several planning and modeling strategies encompassing single site refinery plants, multiple refinery networks, petrochemical networks, and refinery and petrochemical planning systems. It equally provides an insight into possible research directions and recommendations for the area of refinery and petrochemical planning. Furthermore, several appendices are included to explain the general background necessary, including stochastic programming, chance constraint programming, and robust optimization. For engineers and managers working in the petroleum industry as well as academic researchers in production, logistics, and supply chain management.

Alternative Catalytic Materials - Justin S J Hargreaves 2018-07-11 Many important industrial chemical processes rely heavily on catalysis and so researchers are always on the lookout for alternative catalytic materials that may improve existing processes or lead to new ones. Families of alternative catalytic materials currently being investigated include the carbides, nitrides and phosphides as well as amorphous boron catalysts. The addition of carbon, nitrogen or phosphorous to transition metals and the creation of boron-transition metal alloys leads to catalytic materials that have interesting properties, with applications in a range of different reactions, including electrocatalysis. This book provides a comprehensive account of the preparation, characterisation and application of these catalytic materials. It is an important reference for researchers and industrialists working in heterogeneous catalysis and materials chemistry.
Guidelines for Fire Protection in Chemical, Petrochemical, and Hydrocarbon Processing Facilities - CCPS (Center for Chemical Process Safety) 2010-08-13 While there are many resources available on fire protection and prevention in chemical petrochemical and petroleum plants—this is the first book that pulls them all together in one comprehensive resource. This book provides the tools to develop, implement, and integrate a fire protection program into a company or facility’s Risk Management System. This definitive volume is a must-read for loss prevention managers, site managers, project managers, engineers and EHS professionals. Note: CD-ROM/DVD and other supplementary materials are not included as part of eBook file.

Fundamentals of Petroleum Refining - Mohamed A. Fahim 2009-11-19 Fundamentals of Petroleum Refining presents the fundamentals of thermodynamics and kinetics, and it explains the scientific background essential for understanding refinery operations. The text also provides a detailed introduction to refinery engineering topics, ranging from the basic principles and unit operations to overall refinery economics. The book covers important topics, such as clean fuels, gasification, biofuels, and environmental impact of refining, which are not commonly discussed in most refinery textbooks. Throughout the source, problem sets and examples are given to help the reader practice and apply the fundamental principles of refining. Chapters 1-10 can be used as core materials for teaching undergraduate courses. The first two chapters present an introduction to the petroleum refining industry and then focus on feedstocks and products. Thermophysical properties of crude oils and petroleum fractions, including processes of atmospheric and vacuum distillations, are discussed in Chapters 3 and 4. Conversion processes, product blending, and alkylation are covered in chapters 5-10. The remaining chapters discuss hydrogen production, clean fuel production, refining economics and safety, acid gas treatment and removal, and methods for environmental and effluent treatments. This source can serve both professionals and students (on undergraduate and graduate levels) of Chemical and Petroleum Engineering, Chemistry, and Chemical Technology. Beginners in the engineering field, specifically in the oil and gas industry, may also find this book invaluable. Provides balanced coverage of fundamental and operational topics Includes spreadsheets and process simulators for showing trends and simulation case studies Relates processing to planning and management to give an integrated picture of refining.