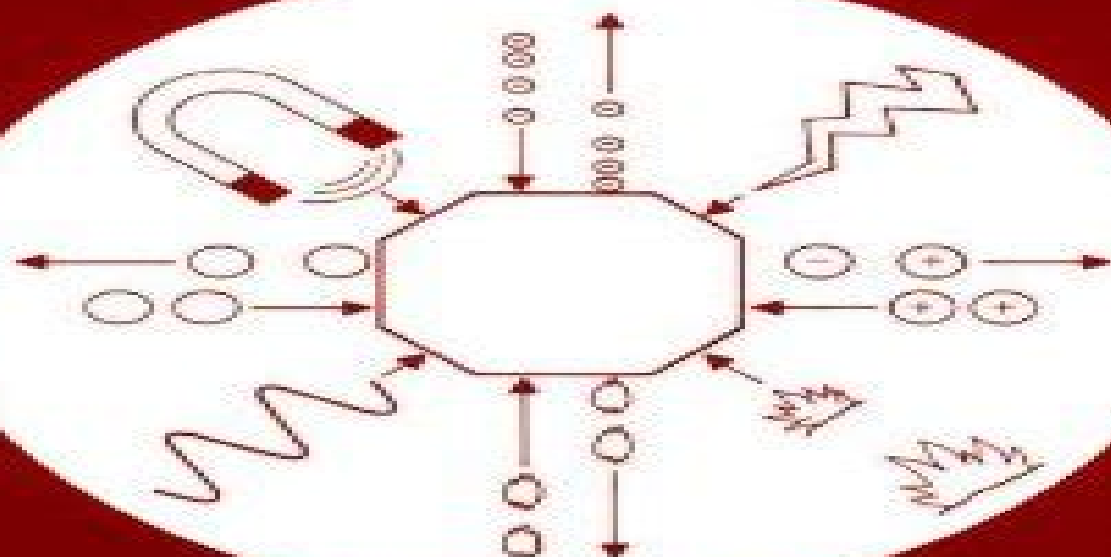


studies in surface science and catalysis



72

**NEW DEVELOPMENTS IN
SELECTIVE OXIDATION BY
HETEROGENEOUS CATALYSIS**

**P. Ruiz and B. Delmon
(editors)**

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New Developments In Selective Oxidation By Heterogeneous Catalysis

**P.A. Jacobs, E.M. Flanigen, J.C.
Jansen, Herman van Bekkum**



New Developments In Selective Oxidation By Heterogeneous Catalysis:

New Developments in Selective Oxidation by Heterogeneous Catalysis P. Ruiz, B. Delmon, 1992-02-06 This volume contains invited papers and communications presented at the Third European Workshop Meeting on Selective Oxidation by Heterogeneous Catalysis The purpose of the meeting was to present recent results and to discuss new aspects of partial oxidation by heterogeneous catalysis The following topics were discussed Novel processes for obtaining new fine chemicals by catalytic partial oxidation selective oxidation and oxidative dehydrogenation of alkanes new catalysts and advances in preparation methods of oxidation catalysts new phenomena in partial oxidation and new aspects of surface chemistry in oxide catalysts new applications of physicochemical methods for characterization of oxide catalysts oxidation with other agents than oxygen and catalytic oxidation of carbohydrates This book will provide a valuable set of data on reactions of selective oxidation which will be extremely useful to catalyst and related practitioners whether fundamentalists or highly applied and to process engineers who wish to evaluate current findings in this field The wide range approach to reactions of selective oxidation will disseminate knowledge in specialized areas of selective oxidation and encourage innovation and creativity

New Developments in Selective Oxidation by Heterogeneous Catalysis (Volume 72). Ruiz P., 1991 *New Developments in Selective Oxidation by Heterogeneous Catalysis* Patricio Ruiz, Bernard Delmon, 1992-01-01 This volume contains invited papers and communications presented at the Third European Workshop Meeting on Selective Oxidation by Heterogeneous Catalysis The purpose of the meeting was to present recent results and to discuss new aspects of partial oxidation by heterogeneous catalysis The following topics were discussed Novel processes for obtaining new fine chemicals by catalytic partial oxidation selective oxidation and oxidative dehydrogenation of alkanes new catalysts and advances in preparation methods of oxidation catalysts new phenomena in partial oxidation and new aspects of surface chemistry in oxide catalysts new applications of physicochemical methods for characterization of oxide catalysts oxidation with other agents than oxygen and catalytic oxidation of carbohydrates This book will provide a valuable set of data on reactions of selective oxidation which will be extremely useful to catalyst and related practitioners whether fundamentalists or highly applied and to process engineers who wish to evaluate current findings in this field The wide range approach to reactions of selective oxidation will disseminate knowledge in specialized areas of selective oxidation and encourage innovation and creativity **New**

Developments in Selective Oxidation II V. Cortés Corberán, S. Vic Bellón, 1994-06-21 This volume contains invited papers and communications presented at the Second World Congress and Fourth European Workshop Meeting on New Developments in Selective Oxidation The purpose of the meeting was to present new topics and recent advances as well as the discussion of new aspects of fundamental and applied aspects of partial selective oxidation in heterogeneous and homogeneous catalysis The following topics were discussed New processes for fine chemicals by catalytic oxidation Recent developments in surface chemistry of oxide catalysts Novel catalytic systems and preparation methods Heterogenized

homogeneous oxidation catalysts Selective oxidation and oxidative dehydrogenation of alkanes New industrial developments based on catalytic oxidation reactions Bio photo and electro catalytic oxidation Oxidation by other agents than dioxygen Bifunctional metal on metal oxide catalysts for selective oxidation This book provides a valuable set of data on selective oxidation reactions which will be extremely useful to catalyst and related practitioners whether fundamentalists or highly applied and to process engineers who wish to evaluate current findings in this field New Developments and Application in Chemical Reaction Engineering Hyun-Ku Rhee, In-Sik Nam, Jong Moon Park, 2006-05-10 This Proceedings of APCRE 05 contains the articles that were presented at the 4th Asia Pacific Chemical Reaction Engineering Symposium APCRE 05 held at Gyeongju Korea between June 12 and June 15 2005 with a theme of New Opportunities of Chemical Reaction Engineering in Asia Pacific Region Following the tradition of APCRE Symposia and ISCRE the scientific program encompassed a wide spectrum of topics including not only the traditional areas but also the emerging fields of chemical reaction engineering into which the chemical reaction engineers have successfully spearheaded and made significant contributions in recent years In addition to the 190 papers being accepted six plenary lectures and 11 invited lectures are placed in two separate chapters in the front Provides an overview of new developments and application in chemical reaction engineering Topics include traditional and emerging fields Papers reviewed by experts in the field **Selective Oxidation by Heterogeneous Catalysts** Gabriele Centi, Fabrizio Cavani, Ferruccio Trifirò, 2012-12-06 Selective Oxidation by Heterogeneous Catalysis covers one of the major areas of industrial petrochemical production outlining open questions and new opportunities It gives keys for the interpretation and analysis of data and design of new catalysts and reactions and provides guidelines for future research A distinctive feature of this book is the use of concept by example Rather than reporting an overview of the literature results the authors have selected some representative examples the in depth analysis of which makes it possible to clarify the fundamental but new concepts necessary for a better understanding of the new opportunities in this field and the design of new catalysts or catalytic reactions Attention is given not only to the catalyst itself but also to the use of the catalyst inside the process thus evidencing the relationship between catalyst design and engineering aspects of the process This book provides suggestions for new innovative directions of research and indications on how to reconsider the field of selective oxidation from different perspectives outlining that is not a mature field of research but that new important breakthroughs can be derived from fundamental and applied research Suggestions are offered on how to use less conventional approaches in terms of both catalyst design and analysis of the data **New Developments in Selective Oxidation** G. Centi, F. Trifirò, 1990-04-26 Approx 890 pages **Recent Advances and New Horizons in Zeolite Science and Technology** H. Chon, S.I. Woo, S.-E. Park, 1996-07-08 This volume was conceived as a handbook for the Pre Conference Summer School on Zeolites held in Taejon Korea The 11th IZC Summer School was organized to acquaint those already actively working in zeolite science and technology with the latest developments and to develop new prospects of zeolite

science and technology for the 21st century The aim of this volume is to give an extensive review and analysis of the important new findings of the last 10 years on the synthesis characterization and applications of zeolite materials as well as the prediction of new R D directions for the next decade *Catalysis* James J Spivey, Sanjay K Agarwal, 2007-10-31 There is an increasing challenge for chemical industry and research institutions to find cost efficient and environmentally sound methods of converting natural resources into fuels chemicals and energy Catalysts are essential to these processes and the *Catalysis Specialist Periodical Report* series serves to highlight major developments in this area This series provides systematic and detailed reviews of topics of interest to scientists and engineers in the catalysis field The coverage includes all major areas of heterogeneous and homogeneous catalysis and also specific applications of catalysis such as NO_x control kinetics and experimental techniques such as microcalorimetry Each chapter is compiled by recognised experts within their specialist fields and provides a summary of the current literature This series will be of interest to all those in academia and industry who need an up to date critical analysis and summary of catalysis research and applications *Catalysis* will be of interest to anyone working in academia and industry that needs an up to date critical analysis and summary of catalysis research and applications *Specialist Periodical Reports* provide systematic and detailed review coverage in major areas of chemical research Compiled by teams of leading experts in their specialist fields this series is designed to help the chemistry community keep current with the latest developments in their field Each volume in the series is published either annually or biennially and is a superb reference point for researchers www.rsc.org/spr *Catalysis: An Integrated Approach* B.A. Averill, J.A. Moulijn, R.A. van Santen, P.W.N.M. van Leeuwen, 1999-09-07 This book concentrates on industrially relevant reactions which are catalyzed by heterogeneous and homogeneous catalysts Homogeneous catalysis by metal complexes is treated jointly with heterogeneous catalysis using metallic and non metallic solids In both areas the high degree of sophistication of spectroscopic techniques and theoretical modelling has led to an enormous increase in our understanding at the molecular level This holds for the kinetics of the reactions and the reactivities of the catalysts as well as for the syntheses of the catalytic materials The development of catalysis science since the first edition of this book has necessitated a thorough revision including special chapters on biocatalysis catalyst characterization and adsorption methods The multidisciplinary nature of catalysis is reflected in the choice of a novel combination of basic disciplines which will be refreshing and inspiring to readers *Advances in Chemical Conversions for Mitigating Carbon Dioxide* T. Inui, M. Anpo, K. Izui, S. Yanagida, T. Yamaguchi, 1998-03-12 Global environmental problems especially global warming caused by the accelerative accumulation of carbon dioxide in the atmosphere are of great importance for humans The world's population is now approaching 6 billion and is still increasing Developments in communication systems and transportation tools have made the circulation of information technologies and materials easier which results in rapid economic growth particularly in the East and Southeastern Asian countries Increased affluence leads to an increased consumption of fossil fuels Inevitably this leads to an

increase in carbon dioxide emission and environmentally hazardous materials which in turn precipitates climatic changes on a global scale Recent studies showed that the increase in carbon dioxide emission for last year was the highest in the past seven years and the total amount of carbon dioxide emission from all over the world reached 6 5 billion tons Furthermore one cannot overlook the report which appeared recently in Nature that the floor area of the iceberg in the South Pole has already decreased by 25% in the past five decades Over 260 scientists and engineers from 21 countries who had a strong interest and wished to contribute to solve the carbon dioxide problem attended this conference The papers presented in this volume cover most of the possibilities of the chemical conversion of carbon dioxide **Applications in Industry**, 1998-12-17

Volume I contains a brief review of adsorption history and its development for practical purposes up until now It also presents some important information on adsorbents and catalysts as well as on the methods of their characterization The part of this volume dealing with practical industrial applications includes chapters presenting advanced technical tools for high capacity adsorption separation of liquid and gas mixtures development of new adsorbents for removal of hazardous contaminants from combustion flue gases and wastewaters degasification of coal seams and fabrication of inorganic membranes and their applications A comprehensive review is also included on contemporary utility of self assembled monolayers adsorption proteins and their role in modern industry adsorption methods in technology of optical fibre glasses sol gel technology solid desiccant dehumidification systems etc The articles give both the scientific backgrounds of the phenomena discussed and emphasize their practical aspects The chapters give not only brief current knowledge about the studied problems but are also a source of topical literature on the subject A comprehensive bibliography on adsorption principles design data and adsorbent materials for industrial applications for the period 1967 1997 concludes the book

Acid-Base Catalysis II H. Hattori, M. Misono, Y. Ono, 1994-11-01 Solid acid catalysts are already being used in various processes in petroleum refining and are presently being studied intensively in both academic and applied fields for usage in a variety of reactions Solid base catalysts are also gaining increasing recognition as potential catalysts Both acidic and basic catalysts are promising not only with respect to acid and base catalyzed reactions but also in materials sciences such as the production of adsorbents sensors ceramics etc The present volume presents the text of 21 invited oral presentations and 58 poster presentations The material covers a wide range of aspects on acid base catalysis from quantum chemistry to industrialized processes Natural Gas Conversion V A. Parmaliana, D. Sanfilippo, F. Frusteri, A. Vaccari, F.

Arena, 1998-09-17 On January 1988 the ascertained and economically accessible reserves of Natural Gas NG amounted to over 144 000 billion cubic meters worldwide corresponding to 124 billion tons of oil equivalents comparable with the liquid oil reserves which are estimated to be 138 billion TOE It is hypothesized that the volume of NG reserve will continue to grow at the same rate of the last decade Forecasts on production indicate a potential increase from about 2 000 billion cubic meters in 1990 to not more than 3 300 billion cubic meters in 2010 even in a high economic development scenario NG

consumption represents only one half of oil 1.9 billion TOE y as compared to 3.5 of oil. Consequently in the future gas will exceed oil as a carbon atom source. In the future the potential for getting energetic vectors or petrochemicals from NG will continue to grow. The topics covered in Natural Gas Conversion V reflect the large global R D effort to look for new and economic ways of NG exploitation. These range from the direct conversion of methane and light paraffins to the indirect conversion through synthesis gas to fuels and chemicals. Particularly underlined and visible are the technologies already commercially viable. These proceedings prove that mature and technologically feasible processes for natural gas conversion are already available and that new and improved catalytic approaches are currently developing the validity and feasibility of which will soon be documented. This is an exciting area of modern catalysis which will certainly open novel and rewarding perspectives for the chemical energy and petrochemical industries.

Experiments in Catalytic Reaction Engineering J.M. Berty, 1999-08-11. The science of catalytic reaction engineering studies the catalyst and the catalytic process in the laboratory in order to predict how they will perform in production scale reactors. Surprises are to be avoided in the scaleup of industrial processes. The laboratory results must account for flow heat and mass transfer influences on reaction rate to be useful for scaleup. Calculated performance based on these results must also be useful to maximization of profit and safety and minimization of pollution. To this end information on products as well as byproducts and heat produced must be generated. If a sufficiently large database of knowledge is produced optimization studies will be possible later if economic conditions change. The field of reaction engineering required new tools. For kinetic and catalyst testing the most successful of these tools was the internal recycle reactor. Studies in recycle reactors can be made under well defined conditions of flow and associated transfer processes and close to commercial operation. The recycle reactor eliminates or minimizes the effect of transfer process and allows the remaining ones to be known. Features of this book: Provides insight into a field that is neither well understood nor properly appreciated. Gives a deeper understanding of reaction engineering practice. Helps avoid frustration and disappointment in industrial research. This book is short and clear enough to assist all members of the R D and Engineering team whether reaction engineers or specialists in other fields. This is critical in this new age of computation and communication when team members must each know at least something of their colleagues fields. Additionally many scientists in more exploratory or fundamental fields can use recycle reactors to study basic phenomena free of transfer interactions.

Catalysis by Metals and Alloys V. Poncet, G.C. Bond, 1995-08-29. Catalysis by Metals and Alloys

Nanoporous Materials II T.J. Pinnavaia, Abdel Sayari, M. Jaroniec, 2000-04-14. The first symposium on Access in Nanoporous Materials was held in Lansing Michigan on June 7-9 1995. The five years that have passed since that initial meeting have brought remarkable advances in all aspects of this growing family of materials. In particular impressive progress has been achieved in the area of novel self assembled mesoporous materials their synthesis characterization and applications. The supramolecular self assembly of various inorganic and organic species into ordered mesostructures became

a powerful method for synthesis of mesoporous molecular sieves of tailored framework composition pore structure pore size and desired surface functionality for advanced applications in such areas as separation adsorption catalysis environmental cleanup and nanotechnology In addition to mesostructured metal oxide molecular sieves prepared through supramolecular assembly pathways clays carbon molecular sieves porous polymers sol gel and imprinted materials as well as self assembled organic and other zeolite like materials have captured the attention of materials researchers around the globe The contents of the current volume present a sampling of more than 150 oral and poster papers delivered at the Symposium on Access in Nanoporous Materials II held in Banff Alberta on May 25 30 2000 About 70% of the papers are devoted to the synthesis of siliceous mesoporous molecular sieves their modification characterization and applications which represent the current research trend in nanoporous materials The remaining contributions provide some indications on the future developments in the area of non siliceous molecular sieves and related materials This book reflects the current trends and advances in this area which will certainly attract the attention of materials chemists in the 21st century Zeolites and Ordered Mesoporous Materials: Progress and Prospects Jiri Cejka, 2005-08-09 Zeolites are the most frequently used industrial catalysts Their applications range from oil refining petrochemistry and the synthesis of special chemicals to environmental catalysis Rapid progress in basic research and the development of new processes has resulted in the first Federation of European Zeolite Associations FEZA School on Zeolites Zeolites and Ordered Mesoporous Materials Progress and Prospects reflects the programme of the first School on Zeolites held in Prague on August 20 21 2005 Readers gain insight into the synthesis of the ever expanding spectrum of zeolites zeotypes and ordered mesoporous materials including the use of zeolites and mesoporous materials as catalysts in organic conversions These range from the fascinating ship in bottle systems via cascade reactions to bulk applications in oil refining and petrochemistry Contributions from world experts enhance the book with select chapters on trends in the molecular sieves field zeolite structures ion exchange properties of zeolites advanced applications with unique technologies and opportunities and a chapter on natural zeolites Contains contributions from world experts in the field Includes an account of the frontier topic of high throughput techniques Reviews the application of quantum chemical methods to zeolite science to show the necessity of combining experimental and theoretical approaches

Introduction to Zeolite Science and Practice P.A. Jacobs, E.M. Flanigen, J.C. Jansen, Herman van Bekkum, 2001-06-26 In view of the substantial progress made in the last decade in the fields of zeolites and related materials it was decided to go for an extended 2nd Edition of Introduction to Zeolite Science and Practice Unfortunately as often is the case this process took more time than expected by the Editors In the mean time some new texts on zeolites were issued Nevertheless the combination of data discussion and dedication provided by the present book is a unique coverage of the field in the opinion of the Editors In the present Edition the number of chapters rose from 16 22 The contributions can be divided into three categories updated chapters by the original authors updated chapters by an expanded or new team of authors and completely

new chapters This 2nd Edition also contains new chapters on Zeolite based supramolecular assemblies by Dirk De Vos and Pierre Jacobs experts in this area and on The use of bulky probe molecules by Paul Kunkeler Roger Downing and one of the Editors Finally the super large pore zeolites and the fast growing area of ordered mesoporous materials are dealt with by Eelco Vogt Charlie Kresge and and Jim Vartuli The latter two authors belong to the discoverers of the M41S family of mesoporous materials

Catalysis and Automotive Pollution Control III A. Frennet,J.-M. Bastin,1995-11-02 These proceedings are based on the third of a series of symposia devoted to the use of catalysis for the depollution of exhaust gases of motor vehicles Although catalysts have been used for this purpose for some thirty years the subject is still very topical because of its economic impact The increasing number of submitted accepted and published papers amply attests to this fact

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Table of Contents New Developments In Selective Oxidation By Heterogeneous Catalysis

1. Understanding the eBook New Developments In Selective Oxidation By Heterogeneous Catalysis
 - The Rise of Digital Reading New Developments In Selective Oxidation By Heterogeneous Catalysis
 - Advantages of eBooks Over Traditional Books
2. Identifying New Developments In Selective Oxidation By Heterogeneous Catalysis
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an New Developments In Selective Oxidation By Heterogeneous Catalysis
 - User-Friendly Interface
4. Exploring eBook Recommendations from New Developments In Selective Oxidation By Heterogeneous Catalysis

- Personalized Recommendations
- New Developments In Selective Oxidation By Heterogeneous Catalysis User Reviews and Ratings
- New Developments In Selective Oxidation By Heterogeneous Catalysis and Bestseller Lists
- 5. Accessing New Developments In Selective Oxidation By Heterogeneous Catalysis Free and Paid eBooks
 - New Developments In Selective Oxidation By Heterogeneous Catalysis Public Domain eBooks
 - New Developments In Selective Oxidation By Heterogeneous Catalysis eBook Subscription Services
 - New Developments In Selective Oxidation By Heterogeneous Catalysis Budget-Friendly Options
- 6. Navigating New Developments In Selective Oxidation By Heterogeneous Catalysis eBook Formats
 - ePub, PDF, MOBI, and More
 - New Developments In Selective Oxidation By Heterogeneous Catalysis Compatibility with Devices
 - New Developments In Selective Oxidation By Heterogeneous Catalysis Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of New Developments In Selective Oxidation By Heterogeneous Catalysis
 - Highlighting and Note-Taking New Developments In Selective Oxidation By Heterogeneous Catalysis
 - Interactive Elements New Developments In Selective Oxidation By Heterogeneous Catalysis
- 8. Staying Engaged with New Developments In Selective Oxidation By Heterogeneous Catalysis
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers New Developments In Selective Oxidation By Heterogeneous Catalysis
- 9. Balancing eBooks and Physical Books New Developments In Selective Oxidation By Heterogeneous Catalysis
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection New Developments In Selective Oxidation By Heterogeneous Catalysis
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine New Developments In Selective Oxidation By Heterogeneous Catalysis
 - Setting Reading Goals New Developments In Selective Oxidation By Heterogeneous Catalysis
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of New Developments In Selective Oxidation By Heterogeneous Catalysis

- Fact-Checking eBook Content of New Developments In Selective Oxidation By Heterogeneous Catalysis
- Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
- 14. Embracing eBook Trends
 - Integration of Multimedia Elements
 - Interactive and Gamified eBooks

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