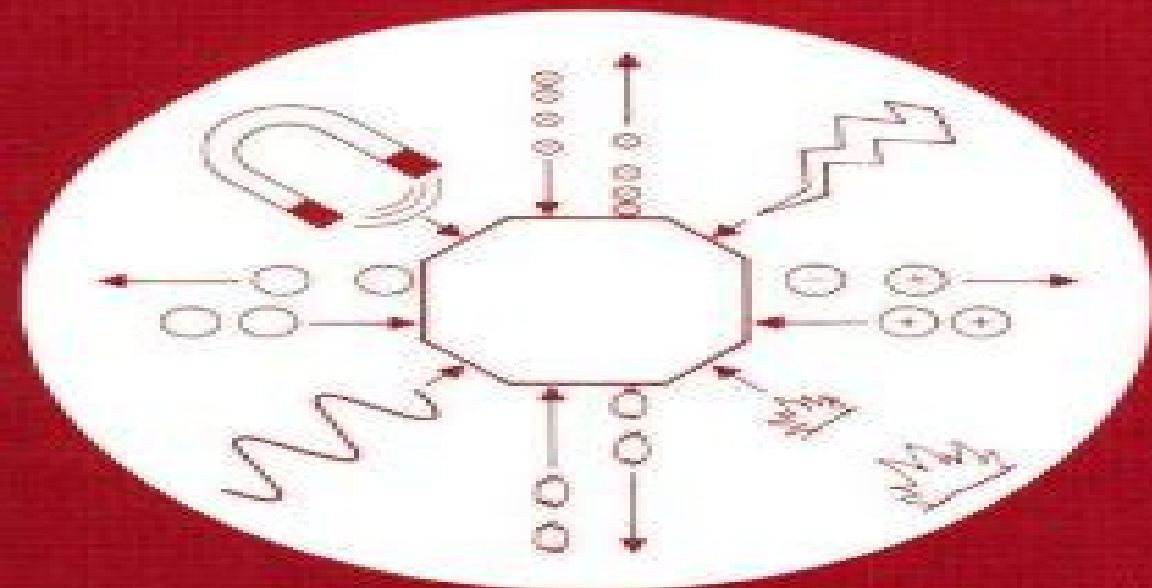


studies in surface science and catalysis



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NEW SOLID ACIDS AND BASES

THEIR CATALYTIC PROPERTIES

K. Tanabe
M. Misono
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H. Hattori

New Solid Acids And Bases Their Catalytic Properties Studies In Surface Science And Catalysis

DJ Losen



New Solid Acids And Bases Their Catalytic Properties Studies In Surface Science And Catalysis:

New Solid Acids and Bases K. Tanabe, M. Misono, H. Hattori, Y. Ono, 1990-02-02 This volume summarises and reviews the enormous progress made over the past two decades in solid acids and bases with emphasis on fundamental aspects and chemical principles In recent years many new kinds of solid acids and bases have been found and synthesized The surface properties in particular acidic and basic properties and the structures of the new solids have been clarified by newly developed measurement methods using modern instruments and techniques The characterized solid acids and bases have been applied as catalysts for diversified reactions many good correlations being obtained between the acid base properties and the catalytic activities or selectivities Recently acid base bifunctional catalysis on solid surfaces is becoming a more and more important and intriguing field of study It has been recognized that the acidic and basic properties of catalysts and catalyst supports play an important role in oxidation reduction hydrogenation hydrocracking etc The effect of the preparation method and the pretreatment conditions of solid acids and bases on the acidic and basic properties the nature of acidic and basic sites and the mechanism regarding the generation of acidity and basicity have been elucidated experimentally and theoretically On the basis of the accumulated knowledge of solid acids and bases it is now possible to design and develop highly active and selective solid acid and base catalysts for particular reactions The chemistry of solid acids and bases is now being related to and utilized in numerous areas including adsorbents sensors cosmetics fuel cells sensitized pressed papers and others The information presented in this book will therefore be of interest to a wide ranging readership

New Solid Acids and Bases Kōzō Tanabe, 1989 *New Solid Acids and Bases*, 1989 **Solid Acids and Bases** Kozo Tanabe, 2012-12-02 Solid Acids and Bases Their Catalytic Properties reviews developments in the studies of acidic and basic properties of solids including the efficacy and special characteristics of solid acid and base catalysts This book discusses the determination of basic and acidic properties on solid surfaces and relationship between acid strength and acid amount The structure and acid base properties of mixed metal oxides and correlation between acid base properties and catalytic activity and selectivity are also deliberated This publication is useful to professional chemists and graduate students in the fields of organic inorganic and physical chemistry petroleum chemistry and catalysis including readers interested in the acidic and basic properties on solid surfaces

The Development of Catalysis Adriano Zecchina, Salvatore Califano, 2017-02-27 This book gradually brings the reader through illustrations of the most crucial discoveries into the modern world of chemical catalysis Readers and experts will better understand the enormous influence that catalysis has given to the development of modern societies Highlights the field's onset up to its modern days covering the life and achievements of luminaries of the catalytic era Appeals to general audience in interpretation and analysis but preserves the precision and clarity of a scientific approach Fills the gap in publications that cover the history of specific catalytic processes

Surface and Interfacial Organometallic Chemistry and Catalysis C. Copéret, Bruno Chaudret, 2005-11-03 With contributions by numerous experts

Superacid Chemistry George A. Olah, G. K. Surya Prakash, Jean Sommer, Arpad Molnar, 2009-03-26 The chemistry of superacids has developed in the last two decades into a field of growing interest and importance. Now available in a new expanded second edition, this definitive work on superacids offers a comprehensive review of superacids and discusses the development of new superacid systems and applications of superacids in the promotion of unusual reactions. Covering Brønsted and Lewis superacids, solid superacids, carbocations, heterocations, and catalyzed reactions, this timely volume is invaluable to professionals, faculty, and graduate students in organic, inorganic, and physical chemistry. **Recent Advances**

in Basic and Applied Aspects of Industrial Catalysis T.S.R. Prasada Rao, G. Murali Dhar, 1998-02-25 Since the Catalysis Society of India was formed in 1973, it has grown into a vibrant and active professional body serving the Indian catalysis community and acts as a professional link between them and the rest of the world. The Silver Jubilee Symposium of the CSI, the thirteenth in a successful series of national symposia, brought together all those devoted to various aspects of this fascinating interdisciplinary field of catalysis. More than 400 delegates from around the country attended, and there was considerable international participation. The scientific programme of the symposium covered different aspects of catalysis processes based on catalysis and novel catalysis materials for various applications. This volume comprises two eminent scientist award lectures, six plenary lectures, five invited papers, and 111 contributed papers, which were critically selected from an impressive response to the call for papers. **Preparation of Catalysts VI** G. Poncelet, J. Martens, B. Delmon, P. Grange, P.A. Jacobs, 1995-03-24 The organizers of this Sixth Symposium maintained their initial objectives, namely, to gather experts from both industries and universities to discuss the scientific problems involved in the preparation of heterogeneous catalysts and to encourage as much as possible the presentation of research work on catalysts of real industrial significance. Another highlight of these symposia is to reserve a substantial part of the program to new developments in catalyst preparation: new preparation methods and new catalytic systems. The fact that chemical reactions, which were hardly conceivable some years ago, have become possible today through the development of appropriate catalytic systems proves that catalysis is in constant progress. The papers in this volume deal with preparation of new catalysts and support catalyst preparation via sol-gel methods, supported catalysts, and synthesis of nanometer-size catalysts. **Chemical Electrostatics**

Fernando Galembek, Thiago A. L. Burgo, 2017-03-09 This book provides new clues for understanding electrostatic charging in solids and liquids, resulting from the surge of research in this active area of science that is taking place since the 1990s but is still largely unknown to most researchers, lecturers, and engineers. Written by a leading researcher in this field, this book describes the formation and properties of the Earth capacitor, the production of environmental electricity, and its effect on natural and anthropic systems, and examines many situations in which water may play a decisive role in electrostatic behavior. The authors present an informed critique of the long-held assumption that pure substances should be electroneutral. In this regard, the authors show that charge partition and accumulation is expected, considering the electrochemical potential.

under non zero electrostatic potential which prevails at Earth surface This book provides conceptual tools to guide the reader through the complexities and consequences of electrostatic phenomena while covering exciting current topics such as energy scavenging from the environment electrostatic based green production energy saving processes electrochemistry at the solid gas interface therapeutic electrostatic treatments applications in sanitation and pest control and control of atmospheric electricity and its use in climate engineering

Heterogeneous Catalysts for Clean Technology Karen Wilson, Adam F. Lee, 2013-09-17 Reactive but not a reactant Heterogeneous catalysts play an unseen role in many of today's processes and products With the increasing emphasis on sustainability in both products and processes this handbook is the first to combine the hot topics of heterogeneous catalysis and clean technology It focuses on the development of heterogeneous catalysts for use in clean chemical synthesis dealing with how modern spectroscopic techniques can aid the design of catalysts for use in liquid phase reactions their application in industrially important chemistries including selective oxidation hydrogenation solid acid and base catalyzed processes as well as the role of process intensification and use of renewable resources in improving the sustainability of chemical processes With its emphasis on applications this book is of high interest to those working in the industry

Solid Supports and Catalysts in Organic Synthesis K. Smith, 1992 Catalysis by Acids and Bases B. Imelik, C. Naccache, G. Coudurier, Y. Ben Taarit, J.C. Vedrine, 1985-02-01 Because of the great importance of acid catalysis in the petrochemical industry extensive research has been carried out during the last 30 years concerning the fundamental and applied aspects of catalysis by acids In contrast base catalyzed reactions have received little attention in heterogeneous catalysis The aim of this symposium was to evaluate our knowledge of the important area of acid and base catalysis and to cover a broad range of solids zeolite chemistry being only one aspect of heterogeneous catalysis

Scientific Bases for the Preparation of Heterogeneous Catalysts E. Gaigneaux, D.E. De Vos, P.A. Jacobs, J.A. Martens, P. Ruiz, G. Poncelet, P. Grange, 2002-08-29 It has become a tradition that every four years the Universit Catholique de Louvain and the Katholieke Universiteit Leuven jointly organize a symposium devoted to the scientific bases for the preparation of heterogeneous catalysts These meetings bring together researchers from academia and industry and offer a forum for discussions on the chemistry involved in the preparation of industrial heterogeneous catalysts This volume containing the Proceedings of the 8th International Symposium on Scientific Bases for the Preparation of Heterogeneous Catalysts consists of papers summarizing most of the 139 oral communications and posters selected by the international scientific committee composed of 27 experts in the field of catalyst preparation holding an industrial or academia appointment The contributions focus on the aspects of catalyst preparation The main topics are new approaches in catalyst preparation advanced preparations of nanoporous and mesoporous catalysts catalysts preparation for special performances and purposes catalysts for environmental purposes and molecular catalysis Emphasis is put on the role that catalysis can play as an essential element of sustainable development

Reaction Kinetics and the Development and Operation of Catalytic Processes G.F. Froment, K.C.

Waugh, 2001-04-03 Reaction Kinetics and the Development and Operation of Catalytic Processes is a trendsetter The Keynote Lectures have been authored by top scientists and cover a broad range of topics like fundamental aspects of surface chemistry in particular dynamics and spillover the modeling of reaction mechanisms with special focus on the importance of transient experimentation and the application of kinetics in reactor design Fundamental and applied kinetic studies are well represented More than half of these deal with transient kinetics a new trend made possible by recent sophisticated experimental equipment and the awareness that transient experimentation provides more information and insight into the microphenomena occurring on the catalyst surface than steady state techniques The trend is not limited to purely kinetic studies since the great majority of the papers dealing with reactors also focus on transients and even deliberate transient operation It is to be expected that this trend will continue and amplify as the community becomes more aware of the predictive potential of fundamental kinetics when combined with detailed realistic modeling of the reactor operation

Future Opportunities in Catalytic and Separation Technology M. Misono, Y. Moro-oka, S. Kimura, 1990-01-22 The production of useful materials and the removal of polluting substances are fundamental to chemical technology and in this respect catalytic and separation processes play essential roles In order to cope with increasing demands to find solutions for the shortage of natural resources and global environmental pollution rapid and significant progress in the technology is required This book results from the successful seminar on Selective Reactions and Separation held at Oiso Japan in February 1988 The seminar was organised by ASPRONC the Association for the Progress of New Chemistry as the fourth in a series of seminars on Frontier Technology ASPRONC was inaugurated in 1986 and its membership comprises major companies in the chemical industry and various other sectors interested in chemistry The aim of this seminar was to explore the frontiers of catalytic and separation technology and to discuss the requirements for its future development The many interesting lectures and active discussions which resulted stimulated the editors to prepare this book Each lecturer has written a chapter which represents a significantly revised and extended version of his original lecture The book will appeal to many readers and will undoubtedly help to make a positive contribution to the future development of chemical technology **Catalytic**

Polymerization of Cycloolefins V. Dragutan, R. Streck, 2000-06-26 This book covers the most important topics concerning cationic Ziegler Natta and ring opening metathesis polymerization of cycloolefins The work describes the major pathways that cycloolefins can follow under the action of specific catalytic systems essentially vinyl and ring opening polymerization both reaction types allowing the manufacture of distinct products with wide applicability in modern technologies The comprehensive data available on this subject are logically and systematically selected and reviewed throughout 18 chapters according to the basic catalytic processes involved types of monomers and catalysts employed reaction conditions and application fields The modern trends in design of chiral metallocene catalysts well defined living metathesis catalysts catalysts tolerant toward functionalities and water systems are highlighted The book discusses in detail the relevant aspects

of these processes including reaction thermodynamics kinetics mechanisms and stereochemistry and correlates the structure of produced polymers with their chemical and physical mechanical properties Related important topics include Ziegler Natta polymerization of olefins and dienes atom transfer radical polymerization of vinyl compounds metathesis of olefins and acetylenes acyclic diene metathesis reaction carbonyl olefination reaction metathesis polymerization of acetylenes metathesis degradation of polymers and ring opening polymerization of heterocycles Special emphasis is laid upon the manufacture of commercial products new polymers and copolymers of potential interest for industry and design and synthesis of speciality polymers with particular structures and architectures and desired properties The book critically evaluates the most recent achievements reported in this field and outlines the modern trends on the research and application of the catalytic processes for cycloolefin polymerization For the first time comprehensive information about the published data on the subject up to now is provided for both academic and industrial researchers working in the areas of polymer chemistry organic and organometallic chemistry surface science and catalysis petrochemistry and chemical engineering This stimulating book offers an enlightening introduction and a quick documentation on the subject as well as a solid background in this field Moreover the work offers a wealth of useful information for specialists applying polymers in various scientific and industrial areas

Aprovechamiento de biomasa lignocelulósica, algunas experiencias de investigación en Colombia Piñeros Castro, Yineth, 2014-12-12 Desde hace unas décadas existen algunas señales que amenazan el actual modelo económico basado en la petroquímica El aumento de la demanda desde economías emergentes la incertidumbre en el precio y suministro y el interés político y social por la reducción de las emisiones de gases procedentes de combustibles fósiles están impulsando la necesidad de reducir la dependencia de las materias primas petroquímicas Por ello es necesario el desarrollo de nuevas energías alternativas y nuevas materias primas renovables que reduzcan las emisiones de gases con efecto invernadero a la vez que permitan el desarrollo de una industria química alternativa a la del petróleo A pesar del enorme potencial que ofrece la biomasa para la obtención no sólo de combustibles y energía sino de otros materiales o productos no alimentarios su aprovechamiento integral es un concepto relativamente reciente EE UU la Unión Europea y Canadá mantienen una política considerada como estratégica de desarrollo de una economía basada en biomasa centrada en tres pilares producción de energía producción de biocombustibles y producción de productos químicos Esta política tiene como objetivo principal desarrollar tecnologías relacionadas con las biorrefinerías para que sean técnicas y económicamente competitivas de manera que los procesos que la integran puedan transferirse a las industrias de los sectores del transporte de la energía y de la química

Catalysis and Adsorption by Zeolites G. Öhlmann, H. Pfeifer, R. Fricke, 1991-06-19 The proceedings of ZEOCAT 90 reflect the wide ranging aspects of the rapidly expanding field of zeolite science and technology The invited plenary lectures given by eminent zeolite scientists summarize current knowledge and address topical areas of zeolite research including a contribution on the use of zeolites as membranes The field of investigations described in the submitted articles in this volume

covers a wide area of problems ranging from the influence of the synthesis process on the properties to questions of acidity adsorption diffusion and catalysis Of special interest are the newly developed applications of zeolites in the synthesis of fine chemicals the use of zeolites for sensors and solid electrolytes and the sophisticated zeolite based separation processes

Calorimetry and Thermal Methods in Catalysis Aline Auroux, 2013-09-18 The book is about calorimetry and thermal analysis methods alone or linked to other techniques as applied to the characterization of catalysts supports and adsorbents and to the study of catalytic reactions in various domains air and wastewater treatment clean and renewable energies refining of hydrocarbons green chemistry hydrogen production and storage The book is intended to fill the gap between the basic thermodynamic and kinetics concepts acquired by students during their academic formation and the use of experimental techniques such as thermal analysis and calorimetry to answer practical questions Moreover it supplies insights into the various thermal and calorimetric methods which can be employed in studies aimed at characterizing the physico chemical properties of solid adsorbents supports and catalysts and the processes related to the adsorption desorption phenomena of the reactants and or products of catalytic reactions The book also covers the basic concepts for physico chemical comprehension of the relevant phenomena Thermodynamic and kinetic aspects of the catalytic reactions can be fruitfully investigated by means of thermal analysis and calorimetric methods in order to better understand the sequence of the elemental steps in the catalysed reaction So the fundamental theory behind the various thermal analysis and calorimetric techniques and methods also are illustrated

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