

Solid Acid Catalysis From Fundamentals To Applications

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Solid Acid Catalysis From Fundamentals
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Heterogeneous Catalysis and Solid Catalysts
Applications. Solid acids are used in catalysis in many industrial chemical processes, from large-scale catalytic cracking in petroleum refining to the synthesis of various fine chemicals. One large scale application is alkylation, e.g., the combination of benzene and ethylene to give ethylbenzene.

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Solids that possess acidic properties on their surfaces function as catalysts just like liquid acids, such as sulfuric acid and hydrochloric acid. By using solid acid catalysts, chemical processes become more productive and more environmentally friendly. In fact, solid acids are being used in many industrial chemical processes from the largest chem

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benzoic acid in the presence of Co and Mn benzoates and hydroformylation of olefins to give the corresponding aldehydes. This reaction is catalyzed by carbonyls of Co or Rh. Heterogeneous catalysis involves systems in which catalyst and reactants form separate physical phases. Typical heterogeneous catalysis systems are inorganic solids such as metals, oxides,

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In fact, solid acids are being used in many industrial chemical processes from the largest chemical process of catalytic cracking in petroleum refining to the synthesis of various fine chemicals. This book covers the fundamentals of solid acid catalysis, including its history and characterization, and discusses different types of catalysts and solid acid-catalyzed reactions as well as their industrial applications.

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The initial two chapters describe fundamentals of solid acid catalysis, including historical development, generation of acid sites, definition of acidic properties on the surface, and roles of acid sites in catalysis. These chapters are for students and young researchers.

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Abstract. The fundamentals of hydrogenation and dehydrogenation catalysis by oxides and sulfides are summarized. The major oxide- and sulfide-based catalytic materials used in the chemical industries for these reactions are considered and their applications discussed.

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Solid acid catalysts - Characterization of solid acid catalysts - Catalytic properties of solid acid catalysts - Hydrocarbon transformation : mechanism and industrial processes - Synthesis of organic chemicals through solid acid catalysis. Responsibility: Hideshi Hattori, Yoshio Ono.

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He is former president of the Catalysis Society of Japan. He chaired the Fourth Tokyo Conference on Advanced Catalytic Science and Technology, held in 2002, and the International Symposia on Acid-Base Catalysis II and IV. Prof. Hattori's field of interest is solid acid and base catalysis.

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This is similar to the case of solid acid catalysts; it took about 20 years that many solid acid-catalyzed processes explosively appeared in 1970s since the fundamental studies of solid acid catalysts started in about 1950. In both cases, the fundamental studies are important for realization of industrial catalytic processes.

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Acid catalysis. In acid catalysis and base catalysis a chemical reaction is catalyzed by an acid or a base. The acid is the proton donor and the base is the proton acceptor, known as Brønsted-Lowry acid and base respectively. Typical reactions catalyzed by proton transfer are esterifications and aldol reactions.

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Solid Acid Catalysis: From Fundamentals to Applications - CRC Press Book Solids that possess acidic properties on their surfaces function as catalysts just like liquid acids, such as sulfuric acid and hydrochloric acid.

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Fuel Cells and Electrocatalysis (Solid Acid Electrolytes) Haile, Sossina M. and Chisholm, Calum R. I. and Sasaki, Kenji and Boysen, Dane A. and Uda, Tetsuya (2007) Solid acid proton conductors: from laboratory curiosities to fuel cell electrolytes. Faraday Discussions, 134 . pp. 17-39. ISSN 1359-6640.

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