

Book Reviews

Catalytic oxidations with hydrogen peroxide as oxidant

Edited by G. Strukul, published by Kluwer, Dordrecht, Netherlands, 1992, ISBN 0792317718, ix + 283 pp., price \$210

As noted by the editor of this book the use of hydrogen peroxide as an oxidant is becoming increasingly popular, largely as a result of increasing environmental pressure on the use of traditional stoichiometric oxidants. Although molecular oxygen is generally the oxidant of choice in petrochemical processes it is too indiscriminate in its reactivity for broad application in fine chemicals synthesis. Hence, the increasing attention that is being focused on hydrogen peroxide, which produces water as the only coproduct.

The last book devoted to oxidations with H_2O_2 dates, as far as I know, from the 1970s. The publication of this collection of articles from internationally regarded experts in the field is, therefore, a timely and useful update of the literature. Although the emphasis is more on mechanistic principles, synthetic applications are also covered.

The first chapter (Strukul) deals with the general principles of catalytic activation of hydrogen peroxide. This is followed by a chapter (Goor) on the manufacture and industrial uses in organic synthesis, in which safety aspects are also addressed. Chapters 3 and 4 (Curci and Edwards) cover the activation of H_2O_2 by organic molecules and Fenton type activation via the formation of hydroxyl radicals.

Chapter 5 (Meunier) deals with biomimetic systems, i.e. oxidations with H_2O_2 mediated by metalloporphyrin catalysts, a subject which has been the focus of much attention recently. Chapter 6 (Strukul) describes the electrophilic and nucleophilic activation of H_2O_2 , by early and late transition metals, respectively. It includes a section on the novel heterogeneous catalyst, titanium silicalite, which has emerged as a major breakthrough in the use of H_2O_2 in industrial organic synthesis. The following chapter (Conte and DiFuria) continues in the same vein with an exposé of reactions involving peroxometal complexes, including the application of phase transfer catalysis to these systems. Finally, Chapter 8 (Hill) describes the use of polyoxometalates as catalysts in H_2O_2 oxidations, an area of much current interest and a logical progression from the preceding chapter.

The various contributions are well written, by authorities in the field, with adequate references to

the literature. In short, this book is a very welcome addition to the literature and is heartily recommended to everybody who is interested in oxidation chemistry. It certainly has acquired a prominent position on your correspondent's bookshelf.

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Physical Chemistry of Inorganic Polymeric and Composite Materials

By Renat S. Saifullin, published by Ellis Horwood, Chichester, UK, 1992, 238 pp.

This book is a concise review on the preparation and characterization of inorganic heterophase materials, mostly based on the long-standing experience of the author, his colleagues and students in the Kazan Institute of Chemical Technology.

Starting from a classification of composite materials and after a synthetic description of the structure of crystalline inorganic substances, the author describes the different types of components of composite materials and their physical and chemical properties. A chapter is specially devoted to interface reactions. Modern investigation methods for the characterization of particles and composites are also reported.

The great number of topics treated in the book, compared to its overall size, hinders a detailed description of each specific subject. However, the concise presentation enables a fast understanding of the contents and provides a review of published material which would otherwise be available only with difficulty.

Of particular interest is the treatment of inorganic solids as polymers and the description of their modification by organic functional groups.

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