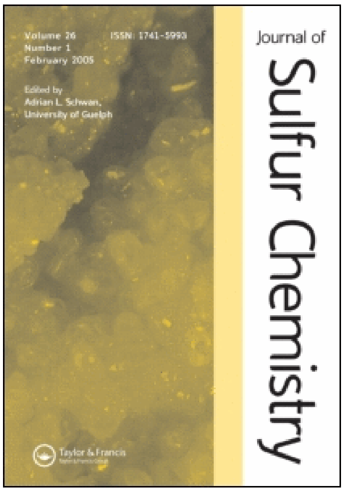

Journal of Sulfur Chemistry
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713926081

Book Reviews

To cite this Article (1994) 'Book Reviews', Journal of Sulfur Chemistry, 16: 1, 145 — 147
To link to this Article: DOI: 10.1080/01961779408048968
URL: http://dx.doi.org/10.1080/01961779408048968

Sulfur Reports, Volume 16, pp. 145–147
Reprints available directly from the publisher
Photocopying permitted by license only

BOOK REVIEWS

Homogeneous Transition Metal Catalyzed Reactions. Edited by William R. Moser and Donald W. Slocum, Adv. in Chemistry Series No. 230, American Chemical Society, Washington, DC, 1992, xiii+625 pp. ISBN 0-8412-2007-7.

The contents of this book is based on a symposium sponsored by the Catalysis Secretariat at the 199th National Meeting of the American Chemical Society, Boston, Massachusetts, April 22–27, 1990.

The editors of this book have succeeded in covering a great deal of homogeneous catalysis and have furthermore been able to persuade scientists from different fields to contribute to the book, making it a valuable collection of state-of-the-art homogeneous catalysis. More than 110 authors have contributed to the book and the book is divided into six main parts: 1. Spectroscopy and mechanism, 2. Asymmetric induction and shape selectivity, 3. C-H activation, 4. Carbonylation and synthetic gas conversion, 5. General functionalization and 6. Oligomerization and polymerisation.

In the first part the following subjects are presented: (i) In situ spectroscopic and NMR technique studies of homogeneous catalysis; (ii) Monitoring of reactions by high-pressure cylindrical internal reflectance and optical fiber coupled reactions; (iii) Para-hydrogen-induced polarization and polarization transfer in hydrogenation and oxidative addition reactions; (iv) A theoretical study of the tricarbonylhydridocobalt-based hydroformylation reaction; (v) Oscillations and chaos in some O_2 reactions and (vi) flash photolysis studies of reactive organometallic intermediates relevant to homogeneous catalysis.

The second part contains (i) A new Ru(II) complex for asymmetric hydrogenation; (ii) Enantioselective catalysis with transition metal compounds: right or left—this is the question; (iii) Shape selective epoxidation of alkenes catalyzed by metalloporphyrins; (iv) Stereocontrol in catalyzed and uncatalyzed hydroborations.

The third part deals with (i) Functionalization of hydrocarbons by homogeneous catalysis; (ii) Mercury-photosensitized C-H bond functionalization; (iii) Activation of C-H bonds in alkanes and other organic molecules using organotransition metal complexes and (iv) Selective hydroxylation of hydrocarbons by platinum salts in aqueous media by which ethanol is converted to ethylene glycol.

The fourth part deals with (i) Amidocarbonylation; (ii) Activation of carbon monoxide by metalloradicals; (iii) Electrochemical vs. chemical synthesis of homogeneous catalysts for regio- and enantioselective alkene hydroformylation; (iv) New carbonylations catalyzed by transition metal complexes; (v) Tetracarbonylalkylcobalts from tetracarbonylhydridocobalt and dimethyl fumarate or aldehydes; (vi) Oxides as heterogeneous promoters for liquid-phase hydrocarbonylation reactions with iodocarbonylruthenium catalysts; (vii) Rhodium-catalyzed reductive carbonylation of methanol; (viii) Hydrogen activation by soluble metal oxide complexes; (ix) Homogeneous bimetallic hydroformylation catalysis; (x) Hydroformylation and hydrogenation with platinum phosphinito complexes; (xi) Rhodium-catalyzed carbonylation of methyl acetate; (xii) Electronic effects on the synthesis, structure, reactivity, and selectivity of rhodium hydroformylation catalysts; (xiii) Influence of organophosphines on the hydroformylation of alkenes catalyzed by anionic ruthenium clusters.

Part five which is devoted to general functionalization presents: (i) Selectivity control in the amination of ethylene glycol; (ii) Electronic and steric control in the catalytic intramolecular carbon-hydrogen insertion reactions of diazo compounds; (iii) Cyclization made easy by transition metal catalysts; (iv) Classic process chemistry; (v) Catalyzed and noncatalyzed hydrosilation of organotransition metal acyl complexes; (vi) Reduction of methanol by tetracarbonylcobalt anion assisted by carbon dioxide and cobalt cation; (vii) Activation of carbon-oxygen bonds; (viii) High-velocity palladium catalysts, and (ix) Hydrosilylation.

The last part of the book contains four chapters: (i) Catalytic synthesis of polymethylsilsesquioxanes; (ii) Model systems for catalytic reactions; (iii) Active sites in soluble Ziegler polymerization catalysts generated from titanocene halides and organoaluminium Lewis acids, and (iv) Homogeneous chromium catalysts for alkene polymerization.

The book should be of interest to research chemists and graduate students in different fields outside the homogeneous catalysis world; it maintains the usual high standard of the series and can be recommended for specialists in the field and libraries.

Karl Anker Jørgensen
Department of Chemistry
Aarhus University
DK-8000 Aarhus C, Denmark

D. H. R. Barton and in part S. I. Parekh, *Half a Century of Free Radical Chemistry*, Cambridge University Press, Cambridge 1993, hardback edition ISBN 0 521 44005X, £30.00/US $49.95, paperback ISBN 0 521 44580 9, £12.95/US $19.95, xi + 164.

This book is an expanded presentation of a series of lectures given by D. H. R. Barton in Milan 1990–1991 under the auspices of the Accademia Nazionale dei Lincei.

In 5 chapters Barton reviews his own research in radical chemistry during 50 years and in the last chapter S. I. Parekh views Barton's pioneering work from the modern perspective, with a review of recent applications in industry and research.

This book is at the same time an overview of radical chemistry in the period 1940–1990 and a historical survey of an important period in synthetic organic chemistry.

Chapter 1 "*The pyrolysis of chlorinated hydrocarbons*" is a description of Barton's own Ph.D. work which mainly involved an economical synthesis of vinyl chloride.

Chapter 2, "*Phenolate radical coupling in synthesis and biosynthesis; Pummerer's ketone*", is initiated by problems involving the biosynthesis of morphine which were due to the acceptance during 30 years of a wrong structure for the so-called "Pummerer's ketone". Barton showed the right structure of this compound and based on the new structure he revised Sir Robert Robinson's proposal on the biosynthesis of morphine and congeners.

Chapter 3 "*Nitrite photolysis* (*the Barton reaction*)" is dealing with the synthesis of aldosterone and related compounds. There was a great interest to study the biological effects of aldosterone at that time; however, the world supply of this hormone was only a few milligrams. In a couple of weeks Barton prepared by his elegant method 60 g of aldosterone!

Chapter 4 "*Radical deoxygenation* (*the reaction of Barton and McCombie*)". The radical reactions described in this chapter were invented to solve the problem of how to remove secondary hydroxyl groups in complicated amino-glycoside antibiotics such as gentamycin.

Chapter 5 "*Disciplined radicals and disciplinary radical reactions* (*Barton decarboxylation*)". The method described in this chapter also arose from a biological problem. A new reaction was needed to manipulate the carboxyl group in peptides and in compounds of the arachidonic cascade. This chapter is mainly written by S. I. Parekh.

Chapter 6 "*Some recent synthetic applications of Barton radical methodologies*" is solely written by S. I. Parekh and is dealing with the impact of Bartons work on modern synthetic planning both in research and industry.

With its 368 references many of these form the late eighties and the beginning of the nineties this book is an excellent introduction to free radical chemistry and its application in organic synthesis. As many of the reactions are carried out on sulfur compounds or by use of sulfur compounds Bartons book is of interest for sulfur chemists although it does not focus in particular on sulfur chemistry.

Carl Th. Pedersen
Department of Chemistry
Odense University
DK-5230 Odense M
Denmark