

Book reviews

Progress in Inorganic Chemistry Volume 40

S J Lippard

Wiley, New York, 1992

598 pages. £105.00; \$159.00.

ISBN 0 471 57191 1

This volume continues the tradition of excellently produced, thoughtful and in-depth reviews. The topics covered are:

- (a) coupling reactions of terminal two-faced π ligands and related cleavage reactions (A. Mayr and C. M. Bastos, pp. 1–98);
- (b) the interface of nanoscale inclusion chemistry (G. D. Stucky, pp. 98–178);
- (c) polydentate phosphines: their synthesis, structural aspects and related applications (F. A. Cotton and B. Hong, pp. 179–290);
- (d) iron- and cobalt-induced activation of hydrogen peroxide and dioxygen for the selective oxidation/dehydrogenation and oxygenation of organic molecules (A. Sobkowiak, H.-C. Tung and D. T. Sawyer, pp. 291–352);
- (e) sterically demanding fluorinated substituents and metal fluorides with bulky ligands (M. Witt and H. W. Roesky, pp. 353–444);
- (f) coordination chemistry of thionitrosyl (NS), thiazate (NSO^-), disulfidithionitrate (S_3N^-), sulfur monoxide (SO) and disulfur monoxide (S_2O) ligands (K. K. Pandey, pp. 445–502);
- (g) thermodynamics of ligand binding and exchange in organometallic reactions (C. D. Hoff, pp. 503–563).

In these days of increasing access to the scientific literature via on-line searches and the burgeoning multi-disciplinary fields involving inorganic chemistry, this reviewer is left wondering whether *Progress in Inorganic Chemistry*, which is published just once per annum, can continue to keep track effectively of progress/growth points in inorganic chemistry in its present format. Perhaps the few in-depth reviews should be replaced by a larger number of briefer reviews limited to literature from the past five years and supported by supplementary databases of earlier references?

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Catalytic Activation of Dioxygen by Metal Complexes

L. I. Simándi

Kluwer Academic Publishers, Dordrecht, 1992

396 pages. £75.00.

ISBN 0-7923-1896-X

This book is concerned with 'the chemistry of the ways in which metal complexes activate molecular oxygen for catalytic oxidations under mild conditions'. It concentrates on developments in the last ten years, and is almost exclusively about oxidations of carbon-containing compounds.

The author has clearly been very industrious in assembling the information he presents. Chapter 1 is a review of dioxygen complexes (with 382 references) which covers biological oxygen carriers such as haemoglobin, as well as compounds such as $\text{Ir}(\text{PPh}_3)_2(\text{CO})\text{Cl}(\text{O}_2)$ which are familiar to the organometallic community. Chapters 2 and 3 are concerned with the catalytic oxidation of alkanes and alkenes and contain 152 and 276 references respectively. The 'Gif system' based on iron acetate and developed by Barton and co-workers is covered here, but the existing commercial processes for the oxidation of cyclohexane to cyclohexanone, and the oxidation of *p*-xylene to terephthalic acid, are treated rather cursorily. The Wacker process is described although the controversy over the mechanism is not discussed in detail. The work continues with three chapters on aromatic compounds and then three chapters on alcohols, diols, and carbonyl compounds. The final three chapters are on the oxidation of nitrogen, phosphorus and sulphur compounds. The index is rather short (four pages) but if it is taken together with the contents pages, the reader should have no great difficulty in finding a particular topic.

This book is more like a cumulative edition of *Annual Reports* than a conventional monograph. Anyone looking for a good exposition of the principles of the subject would be better advised to consult Sheldon and Kochi's *Metal Catalysed Oxidations of Organic Compounds* or the chapters on oxidation in the 2nd edition of *Homogeneous Catalysis* by Parshall and Ittel. However, this book does offer detailed coverage of a large range of oxidations involving molecular oxygen, and will be useful to workers in this area of chemistry.

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