

Book reviews

Activation of Saturated Hydrocarbons by Transition Metal Complexes, by A.E. Shilov. Reidel, Dordrecht, 1984, Dfl. 105 (ca. U.S. \$39.00), pp. 203.

This is part of the series "Catalysis of Metal Complexes" edited by R. Ugo and B.R. James. The activation of saturated hydrocarbons is a process which has considerable potential importance. Developments in the area have been rapid in recent years. This is a timely book written by a major contributor to the field. After a useful Introduction which discusses some of the basic principles involved in designing an activation process, Chapter 1 deals with reactions of metal complexes containing 'activated' C–H bonds. This chapter summarises the many systems where a metal complex will insert into a C–H bond (52 refs.). Chapter 2 discusses reactions with carbenes, free radicals etc. (15 refs.). Chapter 3 discusses the very important area of the activation of hydrocarbons on a metal-oxide surface (29 refs.), while an extensive Chapter 4 considers the oxidation of alkanes in the presence of metal compounds (131 refs.). The final chapter is rather general, dealing with activation by medium and low oxidation state metal species (57 refs.). This book is very readable, presented in good English, and makes a most useful contribution to the field.

Topics in Current Chemistry No. 124, Inorganic Chemistry, by F.L. Boschke (Editor), Springer-Verlag, Berlin, 1984, DM 68 (ca. U.S. \$26.70), pp. 138.

Articles by Christian Klixbull Jørgensen can be relied upon to be interesting and written in a characteristic way with much attention to history as well as science. The first article in this book, by CKJ, is 'The Problems for the Two-electron Bond in Inorganic Compounds; Analysis of the Coordination Number N '. This fascinating article begins with an historical survey of the development of our understanding of the chemical bond and of coordination number. It continues with a detailed discussion of ambiguities in coordination number and its relevance to bonding, e.g. CH_5^+ , $\text{CRu}_6(\text{CO})_{17}$, CuL_5^{2+} and questions related to rare earth crystals where there may be many near neighbours at varying distances (32 pp., 125 refs.). The second chapter deals with 'Cationic and Anionic Complexes of the Noble Gases' and is written by H. Selig and J.H. Holloway, and has obvious connections to the first chapter. The now very extensive chemistry of xenon and krypton is thor-

oughly discussed in a very detailed and scholarly presentation. The evidence for the possible existence of RnF^+ is also reviewed (57 pp., 172 refs.). The 'Extraction of Metals from Sea Water', by K. Schwochau is a complete change of pace. This article brings together the varied and probably not widely known procedures for isolating metals in low concentrations from large volumes of water. For example the author notes that were one to isolate 1 ton of uranium from sea water per day, one would have to process 1 km³ of water! The energy cost of such an engineering feat might well exceed the energy value in the uranium. Nevertheless the sea clearly contains a wealth of important metals and this article presents an interesting survey of the problems and solutions involved (44 pp., 166 refs.). An author index for Vols. 101–124 is also included.

The Chemistry of Ruthenium, by Elaine A. Seddon and Kenneth R. Seddon, in *Topics in Inorganic and General Chemistry*, edited by R.J.H. Clark, Elsevier Science Publishers, Amsterdam, 1984, Dfl. 650 (ca. U.S. \$250.00), pp. 1374.

This enormous tome covers the coordination chemistry, organometallic chemistry, structural chemistry, kinetics, spectroscopy, photochemistry, etc. of ruthenium compounds in their many oxidation states. It is part of a series of books, in which a specific element (or related group) is thoroughly discussed (many now out of print!). The authors are to be congratulated for bringing together such a wealth of material on one element and its compounds. This book must become a bible for anyone working with ruthenium — though its price will preclude personal ownership. While many compounds are noted in the text by a reference, there are extensive tables of data listing spectroscopic information of many kinds (mainly UV/vis/NMR/IR), photophysical data, electron transfer constants and quenching constants. The presentation is divided into chapters each dealing with a different oxidation state of ruthenium. In addition there are specific chapters for ruthenium carbonyl clusters, ruthenium nitrosyls and the rapidly growing field of photophysics and photochemistry of diimine ruthenium systems. Much (X-ray) structural data are included in the text, but, curiously, these are not tabulated together for comparison purposes. It is difficult to ferret out such structural information from the text except where one is looking for a specific compound. The chapters are extensively sub-headed with a contents list which enables one to enter the book fairly readily. There is a subject index but it is rather less useful except as a means of finding specific blocks of compounds. The book is interesting to read with many preparative details. The authors do not say simply A plus B gives C, but frequently add