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Book reviews

Gmelin handbook of inorganic chemistry, 8th edit., *Sc, Y, La — Lu — Rare Earth Elements. Part D5: Complexes and Salts of Carboxylic Acids, Hydroxycarboxylic Acids, and Esters of Carboxylic Acids*, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo, 1984, xiv + 385 pages, DM 1300. ISBN 3-540-93497-9.

This is the twenty-seventh volume of the Gmelin Handbook dealing with the chemistry of "Scandium, Yttrium and the Rare Earth Elements" (System No. 39) to appear since the main volume was published in 1938, and the thirteenth to be published since 1980.

It describes the complexes of these elements with carboxylates and with carboxylic acid esters, under the headings of compounds of monocarboxylic acids, compounds of dicarboxylic acids, compounds of tri- and poly-carboxylic acids, compounds of hydroxy- and oxo-monocarboxylic acids, compounds of hydroxy- and oxo-dicarboxylic acids, compounds of hydroxypolycarboxylic acids, complexes with esters of monocarboxylic acids, complexes with esters of dicarboxylic acids, and complexes with β -ketoesters. The book contains an invaluable seventeen page ligand formula index, which covers not only the present volume, but also any mention of those ligands in Supplement Volumes D1—D3.

The carboxylates represent a class of complexes that has been extensively studied because of their importance to the separation and analysis of the rare earth elements. This volume, however, does *not* deal with this literature, but concentrates upon the synthetic, structural, spectroscopic and solution properties of the complexes. Thus, this volume is of direct and specific relevance to the organometallic and coordination chemist.

The author (E.R. Birnbaum) has performed an outstanding job of collation, and this volume is well up to the expected high standards set by the Gmelin Institute. It should be a part of all libraries attached to academic or industrial organisations in which research into the lanthanide elements occurs; despite its high cost, it is now the definitive source of data upon this important class of complexes.

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Gmelin handbook of inorganic chemistry, 8th edit., *U — Uranium, Supplement Volume C4: Uranium Dioxide*, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo, 1984, xii + 140 pages, DM 544. ISBN 3-540-93509-6.

This is the twenty-fourth volume of the Gmelin handbook dealing with the chemistry of "Uranium" (System No. 55) to appear since the main volume

was published in 1936: it is the first of three to describe uranium(IV) oxide, and confines its scope to the production, preparation and crystallographic properties of UO_2 . The physical and chemical properties of UO_2 will be described in Supplement Volumes C5 and C6. The first sixty-four pages describe, under eleven categories, the preparative routes to UO_2 (including microspheres). This section, although comprehensive and well-written, suffers from the absence of a critical overview, comparing the efficacy of the many synthetic alternatives: the half-page "overview" provided merely acts as a brief contents list. The second section (32 pages) describes the industrial production of uranium(IV) oxide pellets (n.b. other aspects of industrial production are described in Supplement Volume A3 (1981)), and the final section (42 pages) discusses the phase transitions, habit, surface and crystal structure and lattice defects of crystalline UO_2 .

The authors (D. Vollath and H. Wedemeyer) have, like the majority of the Gmelin team, performed a Herculean task in producing a definitive coverage of their defined subject. The volume is well-produced, type-set and clearly illustrated, and its price is in-line with the other volumes in this splendid series. This review is commissioned by *J. Organomet. Chem.* and so I must state the obvious, that this volume contains little of primary interest to the organometallic chemist. However, UO_2 is becoming increasingly used as a synthetic reagent en route to organometallic derivatives, and this volume is *the* source of information relating to the synthesis of UO_2 .

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Organic Reactions. Vol. 33. Wiley; New York, etc.; 1985, xx + 347 pages
£57.00.

This latest volume in a highly regarded series is reviewed in this journal because it contains an extensive and authoritative review (246 pages, 381 references) by E.-I. Negishi and M.J. Idacavage on the formation of carbon-carbon and carbon-heteroatom bonds via organoboranes and organoborates.

The use of organoboron compounds in organic synthesis has been the subject of a good number of monographs and reviews in the last few years, but in view of the importance of such use it cannot be said that there have been too many: Certainly this review will be welcomed by those who actually wish to use organoboron compounds rather than just read about them, since the emphasis is on experimental methods. Thus a brief general introduction (5 pages) is followed by a brief general survey of reactions of organoboranes and organoborates (20 pages), then there is an appropriately detailed account (38 pages) of the preparations of specific types of organic compounds by use of organoboranes and organoborates, including (as is usual in this series) an especially useful section presenting full experimental details on actual preparations of particular compounds. A clear outline of the precautions necessary in handling organoboron compounds is especially welcome.