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Book reviews

Gmelin Handbuch der Anorganischen Chemie, Hauptwerk, 8th Edition, *Seltenerdelemente (System Nr. 39), Teil C, Die Verbindungen, Lieferung 1, Sc, Y, La und Lanthanide· Verbindungen mit Wasserstoff und Sauerstoff*, H. Bergmann, editor-in-chief, via Gmelin-Institut fur Anorganische Chemie der Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Springer-Verlag, Berlin/Heidelberg/New York, 1974, xviii + 437 pages, DM 591, $227.60

The detailed documentation of the elements and their compounds (exclusive of wholly organic compounds) by the Gmelin Institute is continued in the present volume devoted to the rare earth elements: scandium, yttrium, lanthanum and the lanthanides, with literature coverage through 1972. The first 84 pages of this book treat the hydrides of these metals their di- and tri-hydrides, which, however, are nonstoichiometric, defect compounds for which these are the limiting compositions. In an initial section which will be of more general interest, the rare earth hydrides are discussed collectively and their properties, structures and reactivities are compared. In succeeding sections, the individual hydrides are discussed All available data are given concerning their preparation, composition and structure, physical, magnetic, electrical and thermal properties and their reactions. It is noteworthy how little the chemistry of these hydrides has been developed, and one is led to wonder if useful applications as reducing agents in organic, organometallic and inorganic chemistry might not be possible, in addition to those applications already known which are based on their nuclear properties. A complex hydride, $LiEuH_3$, has been prepared, and the area of mixed Ia (and IIa) rare earth complex hydrides is one which merits closer attention.

The major portion of this book (352 pages) covers the oxygen compounds of the rare earth metals, principally the trivalent oxides, but also a few dioxides (of Ce, Pr, Tb) and intermediate oxide phases (MO_x, with x = 1.5-2.0), monoxides (of Eu, Sc, Sm) and peroxides. A section in which these compounds are treated collectively on a comparative basis precedes the detailed discussion of the individual compounds.

This volume is written in German, but the usual English translations of chapter and section headings are provided in the margins. Also helpful is an English translation of the detailed table of contents, whose importance is increased by the lack of a subject or compound index. This volume is an important addition to the review literature of the rare earth elements. It will be of much greater interest and value to solid state chemists than to the readers of this journal.

Department of Chemistry
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139 (U S A)

DIETMAR SEYFERTH