BOOK REVIEWS

Selection of books for review is based on the editors' opinions regarding possible reader interest and on the availability of the book to the editors. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.

Title Lanthanide /Actinide Chemistry

Editor Robert F. Gould

Publishers American Chemical Society

Pages 359

Price $11.00

Reviewer Burris B. Cunningham

This volume is composed of 25 papers presented at a symposium on lanthanide-actinide chemistry held during the 152nd meeting of the American Chemical Society in September, 1966. The topics covered include optical and paramagnetic resonance spectroscopy, thermodynamics, complex ion formation, and the preparative chemistry of various solid compounds. The individual papers range in breadth of coverage from a general review of advances in lanthanide-actinide chemistry from 1960-1966, to such topics of specialized interest as the behavior of europium chelates as laser materials and the potential of the Bk^{4+}-Bk^{3+} couple.

The papers generally are of high quality, but in the opinion of the reviewer, some are exceptionally well written and informative. These include the general review paper by K. Bagnall, E. F. Westrum's survey of recent developments in the chemical thermodynamics of the lanthanides, the discussion of fluorite-related oxide phases of the rare earth and actinide elements by L. Eyring, the theoretical treatment of lanthanide and actinide solution spectra by W. T. Carnall and P. R. Fields, and M. Fred's discussion of the electronic structure of the actinide elements.

Several of the less-general papers are of particular interest as representing important new advances in our knowledge of the chemistry of the $4f$ and $5f$ transition elements. These include the discussion of the kinetics of aqueous oxidation-reduction reactions of U_1, Np, Pu, and Am by R. W. Newton and F. D. Baker, the paper by N. Edelstein, W. Easley, and R. McLaughlin on the optical and paramagnetic resonance spectra of actinide ions in single crystals, the electronic spectra of lanthanide compounds in the vapor phase by D. M. Gruen, C. W. DeKock, and R. L. McBeth, and the contribution by R. Penneman, T. Keenan, and L. Asprey on actinide fluoride complexes.

On the whole, *Lanthanide/Actinide Chemistry* represents a very valuable contribution to the literature in this field of chemistry. The book should be of interest not only to the specialist but to any chemist wishing to acquire a broad perspective of current knowledge about this fascinating group of elements.

Burris B. Cunningham (PhD, University of California, 1940) is Professor of Chemistry at the University of California and a member of the Senior Staff of Lawrence Radiation Laboratory. His work on the chemistry of lanthanide and actinide elements has earned him an international reputation.

Title Molecular Processes on Solid Surfaces

Editors E. Drauglis, R. D. Gretz, and R. L. Jaffe

Publishers McGraw-Hill Book Company

Pages xvii + 651

Price $37.50

Reviewer Donald E. O'Reilly

The physics and chemistry of solid surfaces have advanced admirably in the last decade from both experimental and theoretical techniques applied to the field. The book represents the proceedings of the third Battelle Memorial Institue Materials Science Colloquium held in Kronberg, Germany in May, 1968. The book consists of four introductory lectures by J. H. de Boer, C. Wagner, H. E. Farnsworth, and T. Jansen and 24 research papers under headings of (1) characterization and structure, (2) electronic interactions, (3) adsorption, (4) nucleation and growth, and (5) microscopic effects. Also included are agenda discussions of each topical heading and a prefatory autobiographical sketch honoring the contributions of Professor I. N. Stranski to our knowledge of the structure of surfaces.

The introductory lecture by de Boer outlines views on the mobility of molecules on solid surfaces similar to those in his well-known book *The Dynamical Character of Adsorption.* Carl Wagner's lecture covers