BOOK REVIEWS

Fluidization, Second Edition

Edited by J.F. Davidson, R. Clift, and D. Harrison, Academic Press, Inc., 1985, 733 pp., $96.50/£75.00

This volume follows the format and approach of the first edition, *Fluidization,* edited by J. Davidson and D. Harrison, 1971 by providing a compilation of expository chapters written by internationally recognized experts, covering various aspects of fluidization. The chapter titles and authors are: 1. Incipient Fluidization and Particulate Systems (J.P. Couderc); 2. Hydrodynamic Stability of Fluid-Particle Systems (R. Jackson); 3. Continuous Bubbling and Slugging (R. Clift, J.R. Grace); 4. Gas Jets in Fluidized Beds (L. Massimilla); 5. Distributor Characteristics and Bed Properties (A.B. Whitehead); 6. Spouted Beds (J. Bridgwater); 7. High-Velocity Fluidization (J. Yerushalmi, A. Avidam); 8. Downflow of Solids Through Pipes and Valves (P.J. Jones, L.S. Leung); 9. Mixing (J.J. Van Deemter); 10. Fluidization of Dissimilar Materials (A.W. Nienow, T. Chiba); 11. Elutriation (D. Geldart); 12. Coarse Particle Systems (T.J. Fitzgerald); 13A. Heat Transfer in Fluidized Beds: Convective Heat Transfer in Fluidized Beds (A.M. Xavier, J.F. Davidson); 13B. Heat Transfer in Fluidized Beds: Radiative Heat Transfer in Fluidized Beds (A.P. Baskakov); 14. Immersed Tubes and Other Internals (O. Sitnai, A.B. Whitehead); 15. The Physical Behaviour of Three-Phase Fluidized Beds (R.C. Darton); 16. Drying (D. Reay, C.G.J. Baker); 17. Particle Growth and Coating in Gas-Fluidized Beds (A.W. Nienow, P.N. Rowe); 18. Chemical Reactors (W.P.M. Van Swaiij); 19. Fundamentals of Coal Combustion (R.D. LaNauze); 20. Multiple-Spouted Gas-Fluidized Beds and Cyclic Fluidization Operation and Stability (V.B. Kvasha).

Although the present volume is labeled a second edition the editors have changed the content and focus somewhat from the original; Chapters 4, 7, 8, 12, 17 and 19 represent either entirely new topics or topics that have been given substantially increased coverage. Some articles in the original volume are classics that have stood the test of time, and as the editors state in the preface, ". . . the new volume should not replace the old one completely." The older articles on Particulate Systems (J. Richardson), Bubbles (P. Rowe), and Slug Flow (Hovmand & Davidson), among others, can still be consulted and used to great advantage. In other cases, understanding has improved or new phenomena have come to the attention of researchers to the point where good solid updated reviews are necessary. In this category, I include jetting behavior (Chapter 4), fast-fluidized beds (Chapter 7), and large particle systems (Chapter 12). An interesting feature of the two volumes is that, although they have many subjects and authors in common, none of the repeat authors (with one exception), have written twice on the same topic. Thus, among the many repeated topics, including mixing, reaction engineering, heat transfer, drying, effects of internals, spouted beds and three-phase systems, one can benefit not only from an updated review but also from another point of view.

The authors and editors have achieved remarkable uniformity of notation for such a diverse subject, and the chapters on the whole are well-written and up-to-date. The production quality of both figures and text is excellent. The only slightly negative comment is that the volume is lacking a good chapter on fundamental multiphase fluid mechanics. This volume is a must for any library with a reasonable collection in fluidization. Despite its high cost, it would, like the first edition, be a good purchase for active researchers in the field, as many of the chapters are of truly lasting value.

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Handbook of Aqueous Electrolyte Solutions: Physical Properties, Estimation and Correlation Methods

A. L. Horvath, Ellis Horwood Limited, 1985, 631 p. $154.95.

This book is a compendium of estimation and correlation methods for physical properties of aqueous electrolyte solutions. The first part of the book gives a very brief discussion (14 pages) on the theory of the properties of aqueous electrolyte solutions, primarily concerning the structure of water. The second part of the book surveys in eighteen chapters the correlations found in the published literature for physical and selected thermodynamic properties of aqueous electrolyte solutions. The goal of the book as stated by the author is to present a systematic and complete collection of the more important methods reported in the literature and to make recommendations on the use of this selection of predictive methods. The intended readership is graduate students, workers and researchers in electrochemical science and engineering and related areas.

The title of the book is misleading since this book is not a handbook, but more of a resource guide to prediction and correlation methods for aqueous electrolyte solutions. Although there are tables and figures of physical property data for various aqueous electrolyte solutions, this book is not a comprehensive source for data for any electrolyte. In fact, this book is not indexed sufficiently to enable one to find data or even correlations for a particular aqueous electrolyte solution. For example, suppose you wish to know the viscosity of an aqueous solution of sulfuric acid as a function of temperature or composition. The subject index does not list sulfuric acid or any specific electrolyte. You will not find the subject "viscosity" itself but will find "viscosity diagram of aqueous solution" listed. From the subject index you are referred to Appendix 9 titled "Miscellaneous Figures." In this Appendix there are forty-eight diagrams of physical properties; five are viscosity diagrams, one is for the H_2SO_4-H_2O system. None of the diagrams in Appendix 9 are referenced and for many it is unclear if data or a correlation are represented. If you wish to find a correlation for the viscosity of sulfuric acid, the Table of Contents lists a chapter named "Viscosity." Numerous expressions are given to predict viscosity for aqueous electrolyte solutions in general. However, it is unclear what is the most appropriate correlation to use for a sulfuric acid solution.

This book does offer a starting point for an understanding of how physical properties have been correlated with over 2000