BOOK REVIEWS

Fluidization and Fluid-Particle Systems

By F. A. Zenz, Pemm-Corp Publications, Vol. II, Draft-1989, 665 pp., $60.

As indicated in the Preface, this is the first draft of a volume sequel to an earlier one published by the author with D. F. Othmer in 1960 by Reinhold in a series titled *Fluidization and Fluid-Particle Systems*. The author is one of the most well recognized industrial consultants worldwide in the field of fluidization. This volume addresses a number of important design problems associated with fluidization equipment. It unveils some myths concerning the design know-how which is of practical use for design engineers or practitioners working on fluidized bed systems. Thus, it is a welcome contribution to this important practical field.

The volume consists of 13 chapters. It starts with the author's long-standing perceptions regarding the analogies of physical and thermodynamic properties among vapors, liquid and particulate solids. For example, in analogy, the "boiling points" for gas-liquid-phase transition corresponds to the "terminal velocity" of the solid particle for gas-solid fluidization, and the "temperature" for gas-liquid mixing corresponds to the "interstitial fluid velocity" for gas-solid fluidization. It is interesting to note that in recent efforts, the approach of using the molecular analogy in numerical computation for gas-solid transport by employing the gas kinetic theory bears a similarity to that attempted earlier from a practical viewpoint by the author. The volume goes on to discuss various topics pertaining to fluidization equipment design and correlations. These topics include correlations on incipient fluidization, distributor and plenum region design, solids mixing and segregation, particle elutriation, cyclone performance, design and prediction, particle attrition, internals effects, heat-transfer correlations, granular bed filter performance, ejectors, and particle feeding systems into pressurized vessels. The volume contains valuable detailed design strategies and ideas for equipment varying from wagon wheel and multilevel grids, and inbed spiral platecoil internals to internal cyclone support and bracing and cyclone dipleg eductor. A large number of design problems and calculations and numerical examples are given in the volume.

As noted, this is presented in a draft form. The present volume does not contain complete information on nomenclature, figure captions, references, subject index and so on. Thus, considerable editorial work will be needed before it can be in a publishable book form. The materials presented, however, are very unique reflecting the extensive practical experience and knowledge of the author in this field. It is noted that almost all the references cited in this volume were published before 1980. Information on more recent developments in the design of fluidized systems such as in the areas of high-pressure fluidized bed combustion, fine powder processing, and bioprocessing would be helpful.

With some technical updates and editorial improvements, this volume in a final book form will be a very valuable addition to the fluidization literature. It will provide a very useful and much needed design guide for many types of fluidization equipment which would be most appreciated by practitioners. Academic researchers may also find the volume useful in gaining insight into the complexity of fluidization equipment design.

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Molecular Dynamics Simulation —Elementary Methods

By J. M. Haile, John Wiley and Sons, 1992, 489 pp., $59.95.

The two basic techniques for the molecular-based study of matter by computer simulation were introduced 40 and 36 years ago, respectively (Monte Carlo in 1953; molecular dynamics in 1957). Today, simulations are an indispensable tool of materials science, statistical mechanics, and liquid, solid state and polymer physics. It is only within the last six years or so that an expository literature aimed at educating new practitioners of simulations has started to emerge. This pedagogical literature has now been enriched by Jim Haile's *Molecular Dynamics Simulation—Elementary Methods*. The author aims at providing the novice simulator with a core of fundamental concepts that can eventually be used to tackle a wide variety of problems. In his words, this a book about principles, not applications. Its premise is that fundamentals are best transmitted by concentrating, in depth, on a small number of topics. Accordingly, the book deals exclusively with the deterministic simulation of isolated atomic systems.

Chapter 1 is introductory. Chapter 2, Fundamentals, discusses Newtonian and