quent chapters, experimental results and conclusions from experimental data are treated thoroughly. Special consideration is given to crystallization of alkaline-earth metal tungstates, molybdates, chromates, sulfates, and titanates from the following melts: lithium chloride, alkaline-earth metal chlorides, and sodium tungstate. Considered are variations of crystal size and structure (morphology) with the metal salt, the rate of cooling, and initial crystallization temperature. Differences in behavior of the various systems are highlighted.

Chapters 10, 11, 12 and 13 describe observations from the studies of the systems cited in the above paragraph, and chapter titles ("Crystallization at Constant Temperatures," "Crystallization by Continuous Cooling from Lithium Chloride Melts in alumina Crucibles," "Crystallization by Continuous Cooling from Sodium Tungstate Melts in Alumina Crucibles," and "Crystallization by Differential Thermal Analysis") identify the conditions of alkaline-earth crystallization. Each chapter presents experimental results showing how processing conditions affect crystal sizes, shapes, and nucleation and growth kinetics of the alkaline-earth materials.

The author concludes the book with a chapter that attempts to generalize reported experimental observations by developing and then applying mathematical models to describe kinetic parameters for the subject systems. The model allows determination of the energies, enthalpies, entropies, and free energies of activation for crystal growth, as well as a pre-exponential factor for use in Arrhenius expressions for crystal growth. Tabulations of these quantities determined from experimental data on various systems are an excellent feature of this chapter.

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Slurry Flow: Principles and Practice

By C. A. Shook and M. C. Roco, Butterworth-Heinemann, Stoneham, MA, 1991, 324 pp., $75.00

This book is a comprehensive monograph on slurry transport written by two leading researchers in the field. It is intended for use by plant engineers and designers dealing with slurry transport. The goal of the book is to enable the designer or plant engineer to derive the maximum benefit from a limited amount of test data and to generalize operating experience to new situations. Design procedures are described in detail and are accompanied by illustrative examples. The book is hardly a textbook or a handbook, but most chapters have aspects of both functions. Practitioners will find it a useful reference, while teachers will want to assign particular chapters as collateral reading for undergraduate and graduate courses in fluid mechanics and related areas.

The book consists of 11 chapters and five appendices. Chapters 1 to 3 cover the basic concepts of fluid, particle and slurry behavior. The discussions are well presented, and a wealth of references are provided. These chapters give the reader a good background on the underlying principles of fluid-particle systems. Chapter 4 provides a brief background in slurry rheology with emphasis on pipeline design for homogeneous slurries. Chapters 5 to 7 give a fairly complete account of the correlations and models available for predicting deposit velocities and frictional headlosses for nonhomogeneous slurries. The remaining chapters deal with wear mechanisms, pumping equipment, instrumentation, and operating aspects. Throughout the book, the authors guide the reader toward more comprehensive sources of information, and the reference list is excellent and up-to-date. The book is also infused with many practical examples which should enhance the reader's understanding of the material.

In summary, this is a book that provides a balanced overview of slurry flow. The contents of the book constitute a trove of information that will be relished by practitioners of slurry transport.

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Review: "Applied Biocatalysis: Volume 1"

Edited by H. W. Blanch and D. S. Clark, Marcel Dekker, Englewood Cliffs, NJ, 1991, 248 pp., $97.75 (U.S. and Canada)

In the last ten years, a series of exciting scientific and technical developments have revolutionized the use of biological catalysts for analytical and preparative purposes. Advances such as the ability to substitute specific residues in proteins with natural or unnatural amino acids, the application of enzymes in "exotic," that is, nonaqueous solvents and the discovery of new synthetic processes that benefit from the use of biocatalysts, have stimulated great commercial and scientific interest. The increasing importance of enzymatic biocatalysis is underlined by the proliferation of patents and research articles in the area. However, since enzyme technology is highly interdisciplinary, the relevant scientific literature is dispersed in more than a dozen journals in disciplines ranging from biochemical engineering to protein chemistry and applied microbiology. As a result, it has become increasingly difficult to keep abreast of new developments and research breakthroughs. The need for a comprehensive treatise that provides an in-depth overview of the status of biocatalysis has been apparent for many years. Finally, the series *Applied Biocatalysis*, whose first volume appeared in print recently, promises to fulfill this role.

The volume consists of five chapters written by internationally known experts. The rationale for the chapter selection is not immediately apparent, since the first two deal with general aspects of enzyme engineering in organic solvents whereas the remainder focus on synthetic applications. The first chapter by J. S. Dordick presents an overview of how enzymes perform in nearly anhydrous organic solvents and a survey of related applications. Written in a simple, easy-to-follow manner and with an extensive reference list, this chapter represents an excellent introduction to this increasingly important area. In the second chapter, Hwang and Arnold review the effect of water on enzyme function. Based on a thoughtful consideration of the factors that contribute to the protein folding in aqueous solutions, they propose a set of rules for guiding the engineering of enzymes, that is, the replacement of specific amino acids in the protein sequence, to achieve higher stability in organic solvents. Admittedly, this is a very difficult task given that there is no experimental information on the molecular mechanism of enzyme deactivation in organic solvents. However, the fact that the limited data on the effects of amino acid