tists and technologists working in the field of oxide chemistry and catalysis.

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Interfacial Phenomena. Equilibrium and Dynamic Effects

By Clarence A. Miller and P. Neogi, Marcel Dekker, 1985, 354 pp., $69.50.

This book is Volume 17 in the "Surfactant Science Series," familiar to any researcher in interfacial phenomena. Unlike most of its predecessors in this series, this volume is written as a textbook.

Interfacial Phenomena. Equilibrium and Dynamic Effects is the first book in the field written by chemical engineers specifically for chemical engineering applications of colloid and surface chemistry. As a result, it contains a significant amount of material previously unavailable in a single volume, treated in a unified manner. Furthermore, much of the basic material is presented more rigorously than in traditional references and texts in interfacial phenomena.

The first four chapters are an introduction to the principles of interfacial phenomena. Chapter 1 covers the fundamentals of interfacial tension. The concept of interfacial tension is derived scrupulously using both thermodynamics and mechanical approaches. This concept is extended to applications including shapes of interfaces, measurement of interfacial tension and adsorption. A particularly unique feature of this chapter is the inclusion of a discussion of the Cahn and Hilliard approach to calculating interfacial density and concentration profiles. Chapter 2 continues along the same lines, covering wetting and contact angle phenomena. Both molecular and empirical approaches are included. Once again, material unique to this text is included covering contact angle hysteresis and density profiles in liquid films.

Chapters 3 and 4 are a basic introduction to colloids and surfactants, respectively. The chapter on colloids only covers particle interactions in detail, immediately moving to discussions of colloid stability and coagulation. The section on polymer stabilization of colloidal dispersions is somewhat unique to texts in this area. Conspicuously absent is significant treatment of electrokinetic phenomena. The chapter on surfactants briefly covers some chemistry of surfactants and one model of micellization thermodynamics. The majority of the chapter is devoted to other patterns of association such as microemulsions, liquid crystals and surface films, some of which represents material not treated in other texts.

Chapters 5–7 cover interfacial transport phenomena, and really set this book apart from all others in this field. Interfacial conservation equations are derived, and their application to problems in interfacial stability is emphasized. In particular, an entire chapter is devoted to interfacial stability and wave motion, using linear stability analysis. This chapter is very readable since the discussion is limited to the prototypical instabilities that give physical insight without excessive mathematical complexity. A second chapter covers instabilities caused by heat and mass transfer, including the familiar Marangoni instability. Brief discussions of nonequilibrium interfacial tension, and the effects of chemical reaction and spontaneous emulsification are also included. The third chapter briefly covers a variety of other problems in interfacial transport including surface rheology and dynamic contact lines.

In reviewing a book such as this, the goals of the authors as well as the utility of the book to the interdisciplinary audience to which it must appeal should be considered. The authors have written this book to give a brief introduction to interfacial phenomena with significant emphasis on the nonequilibrium aspects. In this sense, they have been successful. Any chemical engineer with knowledge of transport phenomena could learn the principles of interfacial phenomena from this book. Anyone with previous knowledge of colloid and surface chemistry could do the same, although some knowledge of transport phenomena might be a useful prerequisite. The phsyical explanations that encompass the analysis are uniformly excellent. The reader desiring to learn the material in detail, particularly that on interfacial dynamics, will want to keep a paper and pencil handy to insert missing steps in the derivations, not always a trivial exercise in this book. The reader doing this will find very few errors in the equations, all of which are obvious. The same applies to the descriptive material. Readers seeking more depth on particular topics will find ample references to other texts and the research literature. In summary, the practicing engineer or scientist in colloids and surfaces should consider this book essential as a reference.

Finally, the utility of this book as an instructional text should be considered. Students may find the presentation somewhat terse compared to other textbooks, and many of the problems are quite challenging both intellectually and analytically. For a one-semester course emphasizing interfaces and interfacial transport, there is no better text available. For a course on colloids, this book is unsuitable. For a one-semester survey course covering both interfaces and colloids, such as that taught by this reviewer, the book can still be used as long as it is supplemented with material on colloid science and colloid transport. While the price may seem high for a textbook, the publisher does offer almost a 40% discount on orders of at least five copies for classroom use.

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Handbook of Energy Systems Engineering

Edited by Leslie C. Wilbur, Wiley Series in Mechanical Engineering Practice, 1985, 1,775 pp., $74.95.

According to the publisher, this volume "is a rich sourcebook of reference data and formulas, performance criteria, codes and standards, and techniques used in the development and production of energy." Material was "chosen for its optimum usefulness and applicability to the field of energy engineering."

The Publisher's advertisement is a fair summary of this comprehensive handbook that will be of special use to practicing engineers with prior familiarity with any of the many subjects for which this reference volume serves as a source of quantitative data. The book is not meant to be and is not suitable as a textbook on energy engineering.

The book contains the following information: demographics (energy demands, consumption, prices, and sources); energy use for conservation, heat utilization, storage, transportation, and cogeneration; energy utilization laws and principles (thermodynamics, heat transfer, thermophysical properties, and fluid mechanics); energy systems technology (pumps, fans, valves, piping, lubrication, instrumentation and controls, compressors, cooling systems, water treatment,