

BOOK REVIEWS

Surface and Colloid Science, Vol. 5, E. Matijevic, Ed. John Wiley & Sons, Inc., New York, 1972. 329 pp. \$22.50

Continuing the trend of the previous four volumes in the series on "Surface and Colloid Science," this volume contains four up-to-date critical reviews on important topics in surface chemistry. All of the chapters, written by well-known authorities in their field, are well documented, and contain a wealth of information which may not be easily obtained elsewhere. The subjects, which are summarized below, are treated competently and comprehensively enough to satisfy both the newcomer and the specialist in the field. Each chapter is well organized, with a table of contents and a bibliography which extends to 1970. Furthermore, a general author and subject index is found at the end of the book. This volume of the series, although encompassing three unrelated topics, should prove stimulating and useful both to research workers and students of surface chemistry.

"Rheological properties of Monomolecular Films," Part I: Basic Concepts and Experimental Methods, by M. Joly. Although surface rheology has been treated elsewhere, this and the subsequent chapter appear to be the first comprehensive and critical treatment of this subject, both from an experimental as well as a theoretical point of view. After a general introduction, the author discusses the general concepts regarding the mechanical properties of monomolecular films such as two-dimensional systems, mechanical coupling between film and subphase, basic concepts of surface rheology, and the principal types of rheological behavior in surface films. Following this discussion, the author reviews the methods of experimental surface rheology, such as the measurements of surface elasticity and viscosity, and surface rheometry (pp. 77).

"Rheological Properties of Monomolecular Films," Part II: Experimental Results, Theoretical Interpretations, Applications, by M. Joly. The experimental results cover both vertically and horizontally oriented monomolecular films. The shear viscosity of fatty acids, fatty alcohols, fatty amides, fatty amines, nonionic polymers, polyelectrolytes, polypeptides, proteins, and many other species are elucidated. The rheological properties of monomolecular films are explained in terms of dilational and shear strains. The general mechanical behavior of interfaces in wave damping, in stabilization of emulsions and foams, and in mass transport at interfaces are explained. Finally, several applications of surface rheology are listed such as determinations of activation interaction energies, determinations of molecular conformations, and transitions, molecular interactions, and deformability in monomolecular films (pp. 116).

"Physical Chemistry of Detergency," by A. M. Schwartz. Although far more comprehensive treatments of this subject have appeared in the literature,

the chapter is useful to introduce the newcomer to the principles of detergency. The author discusses in general terms without presentation of any quantitative examples practical and model deterative systems, mechanism of soil removal, and the dynamics and kinetics of soil removal (pp. 44).

"Friction, Lubrication, and Wear," by D. Tabor. The author, who has contributed to the pioneering advances in this field, has admirably reviewed the subject again in the light of the latest concepts. The treatment is critical and reinforced by well selected experimental data. The chapter is divided into three parts friction, lubrication and wear. Three types of solid surfaces are covered, namely, metal, polymer and ceramic surfaces. The relative contributions of adhesion and deformation to friction are well explained. The most up-to-date experimental techniques are included.

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