

It is a fine book and is warmly recommended for graduate students and for professionals who feel they may have lost touch with modern developments in theoretical chemistry.

DEPARTMENT OF CHEMISTRY
POLYTECHNIC INSTITUTE OF BROOKLYN GERALD OSTER
BROOKLYN, NEW YORK

Surface Phenomena in Chemistry and Biology. Edited by J. F. DANIELLI, Ph.D., D.Sc., F.R.S., Professor of Zoology, King's College, London, K. G. A. PANKHURST, Ph.D., D.Sc., F.R.I.C., Packaging Research and Development Division, Reed Paper Group, Formerly Senior Principal Scientific Officer, British Leather Manufacturers' Research Association, and A. C. RIDDIFORD, Ph.D., Lecturer in Chemistry, The University of Southampton. Pergamon Press, Inc., 122 East 55th Street, New York 22, N. Y. 1958. 330 pp. 15.5 × 23.5 cm. Price, \$10.00.

This collection of twenty-three essays is published in honor of Neil Kensington Adam, whose portrait appears as frontispiece, at the occasion of his retirement from the chair of chemistry in the University of Southampton. A glance at its contents shows many famous names in the field of surface chemistry. About one-third of the contributions deals with the chemistry of unimolecular layers, a field which has been greatly advanced through Adam's efforts. Not only fundamental problems are treated as, e.g., by Alexander and by Devichian, but the application of monolayer techniques, e.g., to the theory of tanning is discussed by Pankhurst. Amongst the other articles, which cannot be completely enumerated, one deals with the peculiar surface phenomena of liquid crystals, a little known subject. Schulman describes experiments with high speed photography, elucidating the behavior of air bubbles impinging on crystal surfaces, a contribution to the theory of flotation. The last group includes among others articles by Danielli, one of the volume's editors, Frazer and Rideal; they treat of general and specific aspects of surface chemistry in biological systems. An introductory article by A.S.C. Lawrence surveys in a nostalgic mood the history of surface chemistry from 1917 to 1957 and emphasizes Adam's role in its development.

While the field has grown too wide to permit of a complete cross-section within little more than 300 pages, the volume provides valuable information on the endeavors of an important group of surface chemists, who have honored Dr. Adam by contributing their representative best. The group of his pupils and friends, found in this well prepared and handsomely bound volume, comprises primarily colleagues from Great Britain, also a few Frenchmen and Russians. Dr. Adam may be assured that his life's work is equally appreciated and admired by the rest of the scientific world.

DEPARTMENT OF CHEMISTRY
MOUNT SINAI HOSPITAL HARRY SOBOTKA
NEW YORK, N. Y.

Measurement and Calculation of Temperature and Conversion in Fixed-Bed Catalytic Reactors. By JØRGEN KJÆR. A Contribution from Haldor Topsøe, Chemical Engineers, Hellerup, Denmark. Jul. Gjellerups Forlag, Sølvgade 87, Copenhagen, Denmark. 1958. 201 pp. 16 × 23.5 cm. Price: Paperbound, 25,00 Danish Kroner; cloth-bound, 30,00 Danish Kroner.

This work is a discussion of the problems of temperature, rate and conversion calculations in reactors such as ammonia converters.

The author divides the book into two parts—theoretical and experimental. The theoretical part is concerned not with mechanisms but with detailed methods for calculating temperatures in fixed beds particularly ammonia converters. Included is an excellent review of the literature, and some of the author's own work on thermal profile calculations.

In the experimental part, Dr. Kjær includes his work on phthalic anhydride synthesis and the analysis of data from several ammonia converters. In this he checked details carefully.

The appendices include English and Danish summaries of the book by chapter, a list of symbols, the usual pertinent conversion factors and a bibliography (380 references).

The book also includes generally useful tables of heat transfer data for packed beds containing various materials.

I was pleased with the way the author outlined what he was about to say both in the introduction and at the beginning of each chapter and then set about expeditiously to do so. The purist will object to some word usage, but there is effected no change in sense. Dr. Kjær's formulation, at times, becomes necessarily complex, but he never assigns a symbol two meanings, whence the 213 symbols.

I felt the author was somewhat cavalier in fitting his calculations to the data. For example, on page 156 he assigns an activation energy of 45 kcal./mole for the reaction above 450° in a TVA converter. On page 163, he assigns an activation energy of 35 kcal./mole above 450° and 30 kcal./mole above 500° to get a better fit in the Montecatini converter. The apparent change in activation energy with temperature suggests that the intraparticle diffusion effects be considered more carefully at that pressure (275 atmospheres).

For those working in the catalytic reactor field, I recommend the book. Others concerned with complex heat transfer problems will find the book of interest.

GENERAL ELECTRIC CO.
KNOLLS ATOMIC POWER LABORATORY W. M. CASHIN
SCHENECTADY, NEW YORK

Liquid Scintillation Counting. Proceedings of a Conference held at Northwestern University, August 20-22, 1957. Editors, CARLOS G. BELL, JR., C. E. Department, Northwestern University, and F. NEWTON HAYES, Health Division, Los Alamos Scientific Laboratory. Pergamon Press, 122 East 55th Street, New York 22, N. Y. 1958. xi + 292 pp. 15.5 × 23.5 cm. Price, \$10.00.

Scintillation counting, as the term is now employed, means the detection of moving charged particles by using a photomultiplier tube in conjunction with a scintillating material. The flashes of light produced in the scintillator by the moving particles are converted by the photomultiplier tube into short intense electrical pulses which can be effectively recorded. This technique was developed over ten years ago when the photomultiplier tube replaced visual observation as the method of detecting the scintillations produced in ZnS by α -particles. The need for larger sensitive volumes to detect charged particles other than α -particles then led to the use of large single crystals of scintillating substances such as NaI and anthracene instead of ZnS. It then was found that if small quantities of organic scintillators such as anthracene were dissolved in a suitable solvent the liquid would be converted into an efficient scintillator. This made it possible to use even larger scintillating volumes. These scintillating liquids found immediate use in counters for high energy particles (Enrico Fermi was one of the early users) and these devices became known as liquid scintillating counters. The technique soon proved to be useful in a very wide range of applications and this counting technique is rapidly replacing geiger counters. In August, 1957, a Conference on Liquid Scintillating Counters was held at Northwestern University. The book reviewed here is a compilation of the reports given at this conference.

The volume is not a well rounded presentation of the subject, as might be expected from the fact that contributions from over thirty authors are included. Many specific applications of the technique are given, some of which are important and interesting, but there is little systematic discussion of the techniques involved and the book can hardly be recommended to a novice in the field who wants to know how to build a liquid scintillation counter. One would judge the title to be too ambitious and the book could more accurately be called a report of the Conference on Liquid Scintillation Counters.

Some sections are excellent. Part I, for example, is a review of the basic physical processes occurring in a scintillating liquid by the authorities on the subject, H. Kallman and M. Furst. The chapter by R. K. Swank on the limits of sensitivity is thoughtfully written and contains some very useful data. Part II on Instrumentation will be of benefit to those with a good background in electronics. Much of the book is devoted to quite special topics which extend in scope from Giant Liquid Scintillation Counters used to detect the neutrino, to an account, "The Simultaneous Use of H^3 and C^{14}