

New Books

L.A. Witting and J.F. Gerecht, Book Review Editors



Distillation Control for Productivity and Energy Conservation, F.G. Shinsky (McGraw Hill Publications, 1977, 365 p., \$19.75).

Many books have been written on the general subject of distillation; however, this book is outstanding in emphasizing the value of control systems to conserve energy of distillation systems while at the same time producing products of desired specifications. The extra cost of energy in producing incrementally higher quality or higher yields may not be economical. This practical treatise will aid plant managers in design of the proper control systems to achieve the desired product at the lowest cost.

With the rising cost of energy, many known but not generally used energy-conserving techniques such as vapor compression and expansion are discussed. Many of us have drawn elaborate schemes for saving energy only to find the cost of the exchangers has exceeded the savings.

Many still operate with excessive reflux ratios for the quality specifications required and furnaces with excessive air. This book should be of value in locating and correcting those losses.

Systems which maximize efficiency, profit, and capacity are carefully analyzed and illustrated with practical industrial examples.

In addition to emphasizing control systems, the book treats in a concise manner conventional distillation processes, e.g., binary multicomponent, absorption, stripping, extractive and azeotropic separations.

The engineer involved in distillation processes should find the book a valuable source of ideas to reduce energy requirements.

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Fundamentals of Electrochemical Analysis, by Z. Galus (Halstead Press, New York, 1976, 520 p., no price available).

This is a volume in the Ellis Horwood Series in Analytical Chemistry under the general editorship of R.A. Chalmers. Because of its wealth of detail, it will serve as an important reference work in electrochemistry for physical and analytical chemists. At the same time, this book is eminently suitable as a graduate level text in electroanalytical chemistry. It contains more than 1,200 literature references and over 1,300 mathematical equations. The readability is exceptionally smooth for a text of this kind despite the fact that it is a translation from the Polish edition. For this result, the translator, Stefan Marcinkiewicz, and the translation editor, G.F. Reynolds, are to be commended.

Although this volume is extremely detailed and rigorous with respect to theory, it is also replete with examples of applications to real problems. Nevertheless, it is not a "how to" book and will not serve as a laboratory guide for beginners. The possibilities as well as the limitations of applications of the various electrochemical methods are explained. Critical evaluation is made of experimental evidence, and the important conclusions are presented. Faced with a choice between presenting "all known methods briefly" and concentrating on certain ones, the author chose the latter alternative. The methods selected are: polarography, chronopotentiometry, stationary electrode voltammetry, and rotating disc

methods.

The book is divided into 20 chapters with literature citations at the end of each. While the latest reference is dated 1974, this work will retain its value for many years because of the wealth of fundamental theory that it contains. Typical chapter titles are: *Structure of the Electrode Double Layer, Rates of Electrode Processes, Diffusion to the Electrode, Equations for Electroanalytical Methods, Electroanalytical Investigation of Complexes, Development and General Characterization of Electroanalytical Techniques.*

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Hydrogenation and Hydrogenolysis in Synthetic Organic Chemistry, A.P.G. Kieboom and F. vanRantwijk (Delft University Press, Holland, 1977, 157 p., 45 Dfl.).

This book is a commendable effort to deal with fundamentals of catalytic hydrogenation and hydrogenolysis and to improve our understanding of a field that is still regarded by many as an art. To overcome the intuitive approach used by many preparative synthetic chemists, the authors review modern mechanistic concepts of hydrogenation and hydrogenolysis.

This thin paperback book is divided into three sections: I. *Introduction*: provides a very cursory treatment of the fundamentals of catalytic reactions of hydrogen with π -bonds (hydrogenation) and δ -bonds (hydrogenolysis). Homogeneous and heterogeneous catalysts are compared. Leading references are given at the end of each short chapter. II. *Hydrogenation*: after a brief introduction of theoretical aspects, separate treatments are given for hydrogenation of alkenic double bonds, aromatic rings, carbon-carbon triple bonds, carbon-oxygen double bonds, carbon-nitrogen multiple bonds, and enantioselective hydrogenation. Homogeneous and heterogeneous catalysts are contrasted throughout these sections. Of most interest to oil chemists is the chapter dealing with hydrogenation of double bonds. The commercial importance of linolenate selectivity in triglyceride hydrogenation is only mentioned briefly. III. *Hydrogenolysis*: after a cursory introduction, the subject is divided into reactions involving the following bonds, carbon-hydrogen (exchange), carbon-carbon, carbon-oxygen, carbon-nitrogen, carbon-sulfur, carbon-halogen, nitrogen-oxygen, nitrogen-nitrogen, oxygen-oxygen, and sulfur-oxygen.

Many examples are offered to provide the insight necessary to achieve selectivity in the conversion of multifunctional organic compounds. Unlike other texts leaning heavily on experimental conditions necessary for selectivity of reaction, this book stretches reaction mechanisms to solve synthetic problems. The style is remarkably lucid for a relatively complex subject. The book is recommended to the research organic chemist for a brief, compact and fundamental background in catalysis.

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