NEW BOOKS

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Automatic Chemical Analysis, James K. Foreman and Peter B. Stockwell (Halsted Press, John Wiley & Sons Inc., New York, NY, 1975, 346 p., $36.50).

Some books can be a chore to review, but this one is not only informative, it is well written and interesting to read. It begins with the usual chapter labeled "Introduction." Unlike many other books, this chapter is valuable to read as it explains the economics, advantages, and limitations of automatic analysis.

The discussion of automation is divided into the various aspects of analytical chemistry: electrochemical, colorimetric, spectroscopic, and others. Also covered is gas, thin layer, and ion exchange chromatography. The book closes with a discussion of laboratory computer systems.

This text is extremely thorough in its description of the various techniques of automation. Schematic diagrams of equipment are given as well as references to the original work. As stated by the authors, the introduction in 1957 of the Technicon AutoAnalyzer has proved to be the dominating influence in automatic analysis. Chemists possessing such equipment can find in this book descriptions of methods and manifolds combining AutoAnalyzer components with such techniques as polarography, amperometric titrations, selective electrodes, atomic absorption, and others. Unfortunately for the authors, the only error found in the book was in my collegues' paper on sodium monofluorophosphate where identification of the solutions was omitted in the manifold diagram. The chapter that covers the various commercially available analyzers is weakened by the failure to tell us if they are still available (some are not) and how well they work.

This book is very valuable for any chemists convinced that he must automate. The limitations of automatic analysis are covered only on a half page; however, what is there is well stated, such as: automatic analysis at the present is applicable only to runs of similar samples.

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Chemical Process Economics: Second Edition, revised and expanded, John Happel and Donald G. Jordan (Marcel Dekker Inc., New York, NY, 1975, 511 p., $19.75 (*Chemical Processing and Engineering:* An International Series, Vol. I).

The chemical industry has undergone many changes, and current economic conditions are quite different from what they were in 1958 when John Happel's first edition of *Chemical Process Economics* was published. The new edition of the text reflects the impact of these changes and improves and modernizes the original material.

The text provides an invaluable working tool which will enable the student and practicing chemical engineer to apply technical data and current economic factors to the optimum design and operation of a chemical processing plant. It provides information on the many problems encountered in the design and economic evaluation of chemical processes, plants, and equipment selection and covers rapid approximate design methods, cost estimation, tradeoff studies, risks, return rate, venture profit, investment recovery, and much more.

The authors have recognized that the structures and procedures of the chemical business are not well known even to the practicing engineer and have introduced a new chapter which provides essential information on the structure, business procedures, and profit making aspects of the chemical industry. They have also included a short essay on inflation, an important aspect of any economic study today. The current decline in the purchasing power of a currency tends to decrease the markets for a chemical manufacturer product and increases the capital investment and operating cost for producing a chemical at the same time. Since even the soundest chemical company is dependent on its profits, engineers who have had to answer to their management for lost profits will find these sections of the text enlightening.

Contents: The Chemical Industry: Its Present Position and Prospects. Principles of Economic Evaluation. Expanded Economic Evaluations Equations. Special Mathematical Techniques. Notes on Costs Estimations. Risk, Return Rate, Investment Recovery. Overall Considerations for Project Analysis. Process Plant Components. **Appendix:** Summation of Times Series: Inflation; Rapid Approximation Methods for the Design of Chemical Process Equipment.

The material presented in the text formed a major part of the subject matter of the course in plant design formerly given to senior chemical engineering students at New York University, the study of economic balances being a natural extension to heat and material balances which are a necessary prerequisite for a plant design project. Modern chemical process economics is quite complex and involves many variables. Consequently, special mathematical techniques have been developed to produce a useful answer to an optimization problem. Sufficient details of the techniques involved are presented in the text so that the practicing process engineer will be in a position to judge their applicability to his problem. Anyone wishing to apply these methods to any considerable extent will find it desirable to study the references indicated in the text. Simple examples are given to illustrate the methods without the use of a computer. However, engineers now use machine computations extensively to perform the complex computations associated with equipment design, and many have found application of the computer useful in the solution of economic problems of the type covered in the text. Because of changing economic factors, the process engineer can no longer depend on studies that were made a few years ago to determine the optimum process route or equipment design.

The authors point out that subjects such as administration, market research, and plant location (which affects such things as shipping cost, labor rates, taxes, and environmental design criteria) are not treated in this book. While they state that other excellent texts are available on these subjects, no attempt is made to provide a bibliography or appendix to integrate pertinent relationships from these texts with the subject matter covered in this text. This may not be a serious omission for the student whose project has a limited scope, but the practicing engineer will realize that these factors do carry great weight in economic evaluations and should have been covered in some detail.

The chapter on cost estimating is limited in scope and primarily covers budget cost estimating techniques for process units but neglects to include methods for obtaining

budget costs for utilities and support facilities, which may be anywhere from 20 to 100% of the cost of the process units. However, in this instance the authors have provided an excellent list of reference texts in cost estimating that will be useful to the practicing engineer.

The book has an excellent author, subject index, and bibliography and is remarkably free from technical and typographical errors.

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The Use of Fragrance in Consumer Products, J. Stephan Jellinek (John Wiley & Sons, Inc., New York, NY, 1975, 219 p., $15.95).

The book is in hard cover and consists of seven chapters.

Chapter 1 is a fascinating discussion on the role of fragrance in a consumer product both as an aesthetic and as a signal attribute. The aspect of fragrance used for signaling or reinforcing product attributes is timely and is excellently presented. The author could perhaps have supported his contention of the importance of fragrance as a communicant with more examples. There is no attempt to discuss how technically to design a fragrance for specific signals.

Chapter 2 covers the marketing research aspects of fragrance selection, through expects, consumer tests, and panels. This chapter is the longest of the text as it presents the various tests rather extensively. The personal comments seem most appropriate.

Chapter 3 concerns the more technical aspects of fragrance selection, namely fragrance stability and compatibility to both product base and package. It deals only with the means of recognizing fragrance stability rather than achieving it. The problems of potential fragrance irritations are also mentioned. The elements of this chapter are presented as an overview, mainly for the nontechnical.

I found Chapter 4 to be the most interesting. It is a logical and forthright account of perfume supplier–consumer goods company relationships. It is written from the point of view of the consumer goods company as it deals with supplier selection, fragrance briefing, and fragrance selection.

The section on "The Fragrance Briefing" was extremely well done and is essentially described with the checklist of Table 4-1. The section also summarizes an interesting and novel list of 11 rules on getting the most from fragrance suppliers.

Chapter 5 describes available consumer tests for determining fragrance differences. The quality control of fragrance is also briefly presented.

Chapter 6 is a very perceptive and subjective treatise on the organization of perfumery operations. Chapter 7 involves a technical discussion of perfume properties but concludes with a discourse on fragrance communication.

The text in general is very unique, highly subjective, and unlike any other books on perfumery. It is especially valuable to those engaged in marketing and marketing research. The perfumer, perfume administrator, and product formulator should also find it useful. It is very well written and easy to read.

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