BOOKS

Pyrolysis Theory and Industrial Practice, by Lyle F. Albright, Billy L. Cyrnes, and William H. Corcoran 482 pp. Academic Press, 1983, $65.00

This book is an engineering anthology where the editors developed the table of contents and then coerced experts on the various topics to actually write the chapters on the preselected subjects. This was a successful method of creating this book and results in a fairly uniform and balanced coverage of the selected topics despite having twenty five contributors.

The eighteen chapters include discussion of the pyrolysis of methane, ethane, propane, butance, alkenes, heavier hydrocarbons (aromatics, olefins) coal, coal derived liquids, oil, shale and coke. Thermodynamics, mass transfer and reactor design are also discussed; indicative of the comprehensiveness of this book is the presence of chapters on materials, process control, economics and process auxiliaries.

Chapter 7 discusses the different types of approaches which can be used for modeling purposes and supports the idea of a mechanistic approach. Extensive tables of kinetic parameters are given in this chapter. However, *Pyrolysis* is not a design handbook. As with any multiple author book, the degree of detail, the utility, and the style vary somewhat from chapter to chapter. For example, chapter 4 on the pyrolysis of heavy hydrocarbons is primarily a review of the qualitative effects of different parameters such as temperature and pressure. On the other hand, chapter 3, on n-butene pyrolysis, gives considerable detail including explicit kinetic equations and theory. The chapters on economics, furnance design and heat exchangers should likewise be considered as valuable background material, but the reader will not be able to use them to design or estimate costs of pyrolysis equipment without considerable additional information, which is to a large degree referenced in the text.

Overall the book is well organized and well written; it meets the stated objectives of the authors which is to present the latest thinking on pyrolysis particularly as it pertains to light olefins. It is recommend reading for those working in the general field, both in industry and academia, with the understanding that it primarily provides a detailed overview and identifies considerations and problems which engineers and scientists working in this field need to be aware of.

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A GUIDE TO CHEMICAL ENGINEERING PROCESS DESIGN AND ECONOMICS, by Gail D. Ulrich, John Wiley & Sons, New York, Chichester, Brisbane, Toronto, Singapore (1984) 472 pages. $35.95.

This worthy addition to the recent spate of texts on process design with economics is targeted for the senior plant design course. Its preachments serve to heighten perception of the traditional viewpoints and the efficaceous practices, or as the author puts it—"the culture," developed by chemical engineers.

The process design segment provides the major contribution; it is a true guide. Flowsheet development is stressed and illustrated with fine examples. In particular Gail Ulrich has organized information for equipment design and specification into 16 generic types for relation and sizing. When a generic area calls for definition and organization to facilitate design the author has created compendia and step-by-step procedures as for reactors. There is no reiteration of standard methods; the reader is directed to common sources. However much extra knowhow, the agglutinating details and ancillary features are introduced there is striking economy here and in the review of fundamental calculations by cogent worked examples. This process design segment is highlighted with symbols for specific equipment types; it is a very graphic book.

The economic analysis section is strong on capital cost estimation. The author has organized equipment cost data along the lines of his 16 generic types and included data on ancillary service systems. Also he has well worked sources to introduce the effects of temperature, pressure and materials of construction on installed equipment costs. The traditional economic balance, here termed economic optomization, is treated but lacks a capital cost charge for profit, endemic prior to the fifties. The author attempted to present profitability and cash flow wit a few worked examples which are not well coordinated. This plus the considerable detail of these problems should inordinately burden most readers.

A special feature is an extensive list of rules of thumb for design. Another is a lively chapter on report preparation, mostly guidance and advice, but with an example.

The coverage is restricted to essentials. It does not consider much auxiliary material such as plant siting, heat exchanger networks, and safety. The treatment is generally well balanced, up to date, and carefully cross referenced. There are plenty of worked problems to support the author's thesis, plus some meaty exercises and suggested design projects.

The text is easy to read. The style is pithy, engaging and personal; it is replete with familiar references. Unfortunately the quality of the writing falters in the segment on economics analysis.

Besides being an excellent candidate for a plant design course, it should be a helpful resource and provide some fresh insights for graduate engineers.

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