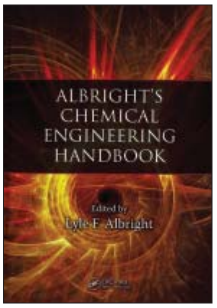
Books

A second look at...
Albright's Chemical Engineering Handbook

Lyle Albright, Editor, CRC Press, Boca Raton, FL, 1,909 pages, $170, Nov. 2008, ISBN: 978-0-824-75362-7



Editor's note: This review is based on a reader's response to a Feb. 2010 review of "Albright's Chemical Engineering Handbook." It represents an alternative appraisal of the book.

The earlier review of "Albright's Chemical Engineering Handbook" (*CEP*, Feb. 2010, p. 53) presented a generally favorable reaction to the book. I share this impression; however, the critique contained several points that seemed inaccurate.

The comparison of "Albright's Handbook" with the venerable "Perry's Handbook" overlooks what I think are the fundamental strengths of the Albright book. Whereas Perry's is a useful resource for data, it is quite difficult to use as a topical refresher. A strength of Albright's book is its clarity in addressing each topic without the clutter of data that can readily be retrieved from other sources.

My current work on a scale-up process involves mixing, slurry handling, reaction kinetics, centrifugal separation, filtering and drying. Albright's book provides concise, essential information on these areas (plus many others) without compromising content and depth. The selection of experts, along with the editorial continuity, make the volume particularly user-friendly.

The original review made five particular points that I would like to address. To check my accuracy, I contacted Dr. Albright for clarification.

1. The review states that only four of the 43 authors are from industry and that this compromises the "practical" content of Albright's book. In actuality, 12 authors spent most of their careers in industry and two others spent considerable time in industry before becoming professors. Furthermore, at least seven other authors are consultants with major companies. The review states that none worked for Exxon Mobil, DuPont, BASF, BP or Shell; in fact, two of the authors did work for these companies and one has consulted for all five of them. In my reading, the practical perspective is well-represented in Albright's Handbook.

2. The review describes the contents of Albright's Handbook as looking older than Perry's latest (2008) edition, claiming that "reference dates suggest that most of Albright's chapters were composed in the last century." However, inspection of Albright's Handbook shows numerous references in the 2000–2007 period. In one chapter, more than a third of the references were published since 2000, and another chapter cites the latest edition of Perry's.

3. The reviewer thinks that there are "too many references," and that they "add clutter." This is a matter of opinion, but it should be noted that the references are located at the end of each chapter and do not clutter the text itself. Furthermore, many of the references are web-based and timely.

4. The review credits Chapter 1, which is devoted to chemical and physical properties, with providing "a good discussion of background relationships," but points out that it contains only one table (for steam and water), vs. nearly 400 tables and charts in Perry's Handbook. I consider this to be a strength of the Albright book. Rather than clutter the chapter with data that can easily be found electronically, Albright distills the basic concepts and provides references for the fundamental data.

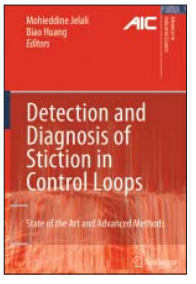
5. The original review describes Albright's Handbook as filling some of the voids unaddressed by Perry's Handbook. I agree, but again I think the point is missed that these are two fundamentally different tools for the practicing chemical engineer. Albright's Handbook devotes significantly more pages to topics like mathematics, heat transfer, reaction engineering, and statistics. The latter is a good example of Albright distilling the essentials for utility and providing a link to a web resource that provides more detail.

In summary, "Albright's Chemical Engineering Handbook" is written in a lucid and clear style and is designed as a working tool for chemical engineers. It stands on its own as a valuable addition to any engineer's library.

— Cliff Kowall, P.E., South Euclid, OH

Detection and Diagnosis of Stiction in Control Loops: State of the Art and Advanced Methods

Mohieddine Jelali & Biao Huang, Springer, London, U.K., 390 pages, $169, Jan. 2010, ISBN: 978-1-848-82774-5



In the process industries, performance is limited by the presence of nonlinear phenomena like static friction (stiction) — the most common problem in control loops manipulated by control valves.

The detection and quantification of stiction is a challenging industrial (and academic) problem, and numerous imperfect solutions have been proposed. This book, part of Springer's "Advances in Industrial Control" series, collects contributions from leading researchers on automatic detection and diagnosis of stiction, and is a comprehensive survey of advanced techniques. The book compares approaches on nearly 100 control loops from

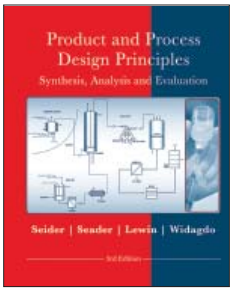
different industries, including chemicals, pulp and paper, mineral processing, mining, and metal processing. Along with the principles, assumptions, strengths and drawbacks of each method, the book provides guidelines and working procedures for their implementation and application. MATLAB-based software can be downloaded to enable readers to apply the methods to their own data.

Methods for the limitation of stiction effects are proposed within the general context of oscillation detection in control loops, stiction detection and diagnosis, stiction quantification, and diagnosis of multiple faults.

Engineers in industry will find the book to be valuable for increasing the performance of control loops, while researchers and graduate students interested in control performance and fault detection will discover a wealth of static-friction-related research and useful algorithms.

Product and Process Design Principles: Synthesis, Analysis and Evaluation, 3rd Edition

Warren D. Seider, J. D. Seider, Daniel R. Lewin and Soemantri Widagdo, John Wiley & Sons, Hoboken, NJ, 736 pages, $186, Dec. 2008, ISBN: 978-0-470-04895-5



In recent years, chemical engineering educators have recognized the importance of teaching scientific approaches to product and process design. The latest edition of this textbook, with its supplement CD-ROM, constitutes a set of courseware that provides chemical engineers with modern strategies for the design of chemical products and processes.

The text, combined with the accompanying "Using Process Simulators in Chemical Engineering" CD-ROM, supports a teaching and learning approach that blends modern computational approaches with simple heuristics.

Emphasizing a systems approach, the book expands upon the strategies for product design, beginning with the need for a project charter, followed by the creation of an innovation map that links potential new technologies to consumer needs. Updated case studies of process design have been added to this edition, making concepts more relevant. The social aspects and economics of product design are also explored.

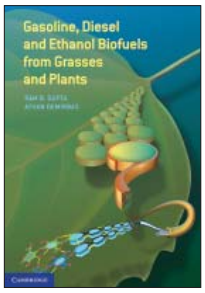
Another key component of the third edition focuses on the stage-gate product-development process (SGPDP) for the design of basic, industrial and configured consumer products, with additional case studies illustrating these product design strategies. The CD-ROM also provides numerous examples of the simulator input and output, with frame-by-frame instructions to discuss the nature of the models provided for the processing units.

The "Using Process Simulators" courseware employs voice, video, and animation to introduce new users of steady-state simulators to the specifics of two of the most widely used process simulation programs — ASPEN PLUS and HYSYS.Plant. Video segments show portions of a petrochemical complex in operation, including distillation towers, heat exchangers, pumps and compressors, and chemical reactors. The courseware contains the solutions for more than 60 examples using either ASPEN PLUS or HYSYS.Plant, as well as problems solved using GAMS, an optimization package, and MATLAB scripts.

Since most curricula place little emphasis on design strategies prior to course work, this updated text and CD-ROM should provide a smooth transition for students and engineers who are called upon to design innovative new products and processes.

Gasoline, Diesel and Ethanol Fuels from Grasses and Plants

Ram Gupta and Ayhan Demirabs, Cambridge Univ. Press, New York, NY, 234 pages, $75, Apr. 2010, ISBN: 978-0-521-76399-8



As petroleum reserves are depleted, the world is faced with the challenges involved in finding alternatives. Any alternatives to petroleum must be technically feasible, economically competitive, environmentally acceptable, and easily available.

First-generation biofuels, such as ethanol from sugar or corn and biodiesel from vegetable oils, are already on the market. This book serves as an introduction to the second-generation of biofuels obtained from non-food biomass — including forest residue, agricultural residue, switchgrass, corn stover, waste wood, and municipal solid wastes. Various technologies and topics are examined, including cellulosic ethanol, biomass gasification, synthesis of diesel and gasoline, biocrude by hydrothermal liquefaction, biooil by fast pyrolysis, and the upgrading of biofuel.

The book begins with a discussion of both nonrenewable and renewable forms of energy, and their environmental and economic impacts, before exploring the potential of biomass. Included are detailed examinations of the various technological pathways for the production of biofuels such as ethanol, biodiesel, biooil and biocrude, as well consideration of the environmental and economic issues involved.