

Distillation: Principles and Practices

Johann G. Stichlmair and James R. Fair
Wiley-VCH, New York, NY, 524 pp., \$89.95, indexed

Distillation is the dominant separation technique of the process industries and probably always will be, which is why a book such as this that collects the experience and wisdom of two long-time practitioners/teachers is most welcome. The authors devote a fair amount of space to theory, but the book's primary focus is on practice. Richly illustrated, it brings in experience outside the process industries to explain some of the principles. One unusual example is the outburst of CO₂ gas that resulted from an adiabatic flash from a deep pool of water near a village in Africa.

My favorite section was the discussion of design and dimensioning of trayed columns, an area where both authors have a long history of expertise. An immense amount of detail on the two phase phenomena involving trays emerged between 1950 and 1990 and is well summarized. Correlations are given for capacity, entrainment, liquid holdup, and transition from froth to droplet regimes. Background behind the correlations is usually provided. Metric units are used in all the correlations. This is a fine, but the U.S.-based reader needs a warning because our common usage is often different. For example, our widely used mixed unit "maximum F-factor" is 18% less than the value dimensioned as (Pa)¹ that is used here.

Any book that covers such a wide range of topics will do a better job on some subjects than on others. The disappointment in this case was the chapter on "Energy Economization in Distillation." Slightly over one-third of it is spent on pinch technology, but it contains nothing on the recent analysis of driving force losses in distilla-

tion columns or even in condensers and reboilers. It fails to frame distillation within the concept of the work of separation, nor does it highlight the inherent advantages of distillation compared to other techniques.

Gas/liquid physical properties make it relatively easy to achieve a high number of countercurrent theoretical stages. This, in turn, means that very low driving forces can be used, and this results in small loss in work potential. In practice, it doesn't always work out that way, which is a different story and one that designers need help on.

Other material covered in this clearly written book includes: vapor/liquid equilibria, single and multi-stage equilibrium calculations, industrial distillation processes, and distillation control. We are fortunate to have this collaborative work by two of the leaders in this important field. Because both authors are professors, it is no surprise that this volume can be easily used as a textbook. It will also be a reference that practitioners will use for years to come.

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Scientific Unit Conversion

François Cardarelli, translated by M. J. Shields
Springer-Verlag, New York, NY, 456 pp., \$39.95

Subtitled "A Practical Guide to Metrication," which is something of an understatement because it covers much more, this book opens with a 43-page introduction on the background and precursors of the SI (Système International d'Unités) approach to weights and measures,

as well as International Electrical Units, Atomic Units, the Gauss system, and British and American schemes. The latter receive the most coverage. Another 44 pages of tables describe systems used by cultures ranging from ancient Egypt to pre-revolutionary Russia.

Approximately 2,000 units are listed alphabetically, along with their standard symbol, conversion factor,

SI equivalent, physical quantity measured, dimension, and a few notes. This is one of the most complete lists of conversion factors I've seen.

Next are 67 pages of tables that list conversions arranged by physical quantity, which is one of the most valuable sections of the book since it conveniently groups such

units together. Nearly every engineering quantity, ranging from length to thermal conductivity, can be found here. My only complaint is that they are arranged in order by size, (meter, foot, yard) rather than alphabetically (foot, meter, yard).

The closing sections feature tables of mathematical constants, a listing of national standards bodies, and a bibliography.

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Chemical Exposure and Toxic Responses

Stephen K. Hall, Joanna Chakraborty, and Randall J. Ruch, Eds.
CRC Press, Inc. Boca Raton, FL, 288 pp., \$59.95, indexed

You may want to have a medical dictionary nearby when you use this handbook (I passed it on to a colleague in the medical profession who was positively effusive about it),

