



Distillation Troubleshooting
Henry Z. Kister, John Wiley & Sons, Inc., Hoboken, NJ,
712 pp., \$99.95, April 2006,
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Any chemical engineer who is actively involved with the design and operation of distillation equipment and systems is most likely aware of the many contributions of Henry Z. Kister to this field of chemical engineering technology. He has had 80 technical

articles on this subject published, and is the author of two prior comprehensive and outstanding books on this topic, namely, *Distillation Design* and *Distillation Operation*.

Quite often, a distillation column will not operate as it should, and then it becomes necessary to find out what the problem is, and how to correct it. This is commonly called "troubleshooting." This book is a comprehensive discussion of the problems that can arise in operating distillation columns, and how to go about troubleshooting and solving these challenges.

The book is divided into two parts. The first, consisting of 29 chapters, is a collection of "war stories," featuring detailed problems and solutions. The second part is an extensive mega-table that presents summaries of all of the "war stories" that the author was able to find in the literature. The summaries include some key distillation-related morals. For each of these case histories, the literature reference is described fully so readers can seek additional details. Many of the case histories could be described under more than one heading, so extensive cross references have been included. *Distillation Troubleshooting* also has a short

write-up on how to use the book, a list of abbreviations, a list of 552 references, and a comprehensive index.

The 29 chapters in Part 1 cover the following topics: Troubleshooting Distillation Simulations; Where Fractionation Goes Wrong; Energy Savings and Thermal Effects; Tower Sizing and Material Selection Affect Performance; Feed Entry Pitfalls in Tray Towers; Packed-Tower Liquid Distributors; Vapor Maldistribution in Trays and Packings; Tower Base Level and Reboiler Return; Chimney Tray Malfunctions; Draw-Off Malfunctions (Non-Chimney Tray); Tower Assembly Mishaps; Difficulties During Start-Up, Shutdown, Commissioning, and Abnormal Operation; Water-Induced Pressure Surges; Explosion, Fires, and Chemical Releases; Undesired Reactions in Towers; Foaming; The Tower as a Filter: Part A. Causes of Plugging; The Tower as a Filter: Part B. Location of Plugging; Coking; Leaks; Relief and Failure; Tray, Packing, and Tower Damage; Condensers That Did Not Work; Misleading Measurements; Control System Assembly Difficulties; Where Do Temperature and Composition Controls Go Wrong?; Misbehaved Pressure, Condenser, Reboiler, and Preheater Controls; and Miscellaneous Control Problems.

As can be seen from the above, practically every conceivable problem and its troubleshooting is discussed. The book covers over 1,200 case histories of problems, diagnoses, solutions and key lessons. It represents the author's 30 years of experience in troubleshooting, revamping, control, and startup of fractionation equipment and processes. I highly recommend this very comprehensive and practical book to any chemical engineer who is involved with the design and operation of distillation equipment and systems.

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Beyond Oil and Gas: The Methanol Economy

George A. Olah, Alain Goeppert and G. K. Surya Prakash, Wiley-VCH Verlag GmbH, Weinheim, Germany, 290 pp., \$29.95, March 2006, ISBN: 3-527-31275-7

The increasing world population and declining availability of cheap oil threaten to plunge the world into a global energy crisis. The U.S. alone represents nearly 60% of global oil demands, and a particularly cold winter in North America can strongly affect global prices. Concerns over the reliance on oil and gas and the impact of fossil fuels on the environment have escalated significantly in the recent years.

Various alternative energies, including nuclear, geothermal and hydrogen, have been explored, but none offer both a safe and efficient option that rivals fossil fuel. Introducing a technology that could significantly alleviate U.S. energy problems, *Beyond Oil and Gas: The Methanol Economy*, illustrates how methanol can be used as a viable alternative to diminishing fossil fuel resources.

The book explores current and alternative energy sources, the interrelation of fuels and energy, and the extent of non-renewable fossil fuel resources. The authors outline the need for hydrocarbons and their products, despite depleting reserves and global warming, and examine the envisioned hydrogen economy and its significant shortcomings. The book shows how carbon dioxide from the atmosphere and industrial exhausts can be converted into safe liquid methanol for use as a fuel and as a raw material for hydrocarbons.

