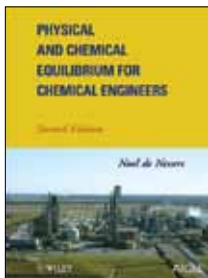




## PHYSICAL AND CHEMICAL EQUILIBRIUM FOR CHEMICAL ENGINEERS, 2ND EDITION



**Noel de Nevers, John Wiley & Sons, Hoboken, NJ, \$130, 384 pages, April 2012, ISBN: 78-0-470-92710-6**

Physical and chemical equilibrium and the calculation of the thermodynamic properties of mixtures are topics of great importance to engineers — although the subject matter is not always easily mastered. The second

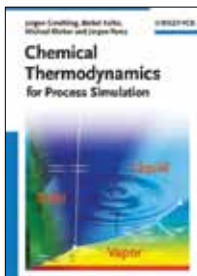
edition of this book explains the fundamentals of equilibrium, and how these fundamentals relate to practical problems in chemical and environmental engineering.

Using simple mathematics and an array of examples, this revised text provides an in-depth discussion of the theory and practice of equilibrium calculations. It shows readers how to solve common and advanced problems — both manually and by using spreadsheets — and then explains how such problems are solved with computer software for process design.

This edition includes a new chapter on equilibrium in biochemical reactions, and new sections devoted to minimum work; eutectics and hydrates; adsorption; and buffers and the charge-balance method of computing them. The book also provides details on how nature attempts to minimize Gibbs free energy. The appendix includes new features such as the Bridgeman Table and its uses, as well as the calculation of fugacities from pressure-explicit equations of state (EOSs).

While intended for advanced chemical and environmental engineering undergraduates, the book will also be of interest to practicing chemical, environmental, and civil engineers. The many examples, sample problems, and solutions presented will help the reader to integrate the book's teachings into his or her own technical toolkit.

## CHEMICAL THERMODYNAMICS FOR PROCESS SIMULATION



**Jürgen Gmehling, Bärbel Kolbe, Michael Kleiber, and Jürgen Rarey, Wiley-VCH, Weinheim, Germany, \$135, 760 pages, April 2012, ISBN: 978-3-527-31277-1**

Process simulation models are important for the development, design, and optimization of a wide range of chemical engineering operations. They also

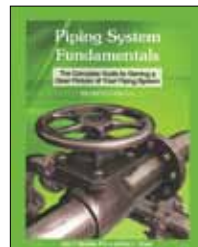
impact economic and political decisions, as in the case of climate modeling. Yet, the wide use of process simulation in industry might be limited by a lack of understanding of thermodynamics and its application in process simulation.

This book explains the thermodynamics behind simulations by applying thermodynamics to real-world process engineering problems. Concepts are illustrated through a variety of solved examples, and the book simplifies the understanding of the often-complex mathematical calculations involved in simulation models. Estimation methods for thermophysical properties and phase equilibria, and the thermodynamics of alternative separation processes, are addressed, as are recent developments in the field. The text also includes special models, such as those for formaldehyde, polymers, and associating compounds.

Techniques for the procedures described are presented at the end of each chapter, along with additional problems and solutions that enable readers to expand their comprehension. An accompanying website provides access to further examples and calculations. The book's appendix includes parameters for the calculation of thermophysical properties.

This text should be useful for chemical engineers and students with a basic understanding of thermodynamics and phase equilibria, and also for engineers involved in chemistry, pharmaceuticals, oil and gas processing, petrochemicals, refining, food production, and environmental protection.

## PIPING SYSTEM FUNDAMENTALS: THE COMPLETE GUIDE TO GAINING A CLEAR PICTURE OF YOUR PIPING SYSTEM, 2ND EDITION



**Ray T. Hardee and Jeffrey L. Sines, Engineered Software Inc. Press, Lacey, WA, \$95, 270 pages, March 2012, ISBN: 978-0-918601-12-4**

Most fluid-dynamics textbooks evaluate the items in a piping system individually. This second edition text emphasizes how the elements of piping systems

— pumps, compressors, pipelines, control valves, and other components — operate together as a whole.

Each chapter has been expanded to include up-to-date case studies, key equations, and concepts. Entirely new chapters have been devoted to tanks and vessels; process equipment; and process measurement and controls. Most of all, the book emphasizes understanding the total piping system and the physical laws that govern the flow of fluids, as well as the flow of energy within piping systems. This comprehensive system knowledge is also applied to troubleshooting techniques.

The book includes scores of charts, graphs, and illustrations, as well as a PIPE-FLO Professional demo program and demo files that support calculations shown in the book.

The tools and knowledge presented in this edition will enable engineers, designers, maintenance supervisors, and plant operators to improve piping system performance.