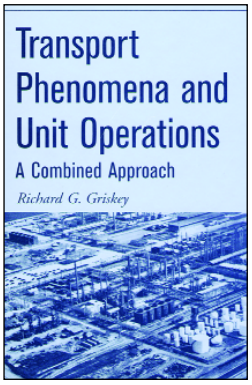
TRANSPORT PHENOMENA AND UNIT OPERATIONS: A Combined Approach

R. G. Griskey, John Wiley & Sons, New York, NY, 448 pp., $99.95, 2002



The idea of integrating transport phenomena and unit operations is a laudable one, inasmuch as these subjects are not mutually exclusive, as is too often assumed, but are indeed continuous and complimentary. This book addresses a broad range of topics within the general areas of fluid mechanics, heat transfer, mass transfer, staged operations and mechanical separations. It is aimed at the uninitiated student, and includes an impressive array of problems at the end of each of the fourteen chapters, as well as a large number of worked examples. However, the expectation that one book of moderate length can do adequate justice to such a broad range of topics is a bit overoptimistic. Due to the extensive breadth of coverage, the depth is quite limited, to the extent that developments, derivations and explanations of the origin and significance of many of the relations presented tend to be cursory or superficial and even, in some cases, misleading. There are also a number of errors or misprints that, hopefully, will be corrected in subsequent printings.

The "transport" components of the book (*i.e.,* transport coefficients and the microscopic conservation equations for molecular transport) comprise a relatively small part of the book, which is probably in suitable proportion to the fraction of practical systems amenable to analysis by these methods. The vast majority of the book is devoted to more-or-less classical unit-operations subjects. These include: incompressible flow in conduits; packed beds; mixing; conduction, convection, boiling, condensing and radiation heat transfer; heat exchangers; diffusion and convective mass transfer; equilibrium staged operations, including binary distillation (with a brief discussion of multicomponent distillation), packed absorption and extraction columns and leaching; filtration; centrifugation; sedimentation; and cyclone separations.

The material is mostly classic and the methods simplified based on graphical or empirical tools. Some of the material is current, but some is also outdated, with better or more accurate methods being available. For the beginning student or the non-chemical engineer, this book does provide a good introduction to a wide range of chemical engineering related topics, but should not be construed as the most complete or current treatment of the subjects covered.

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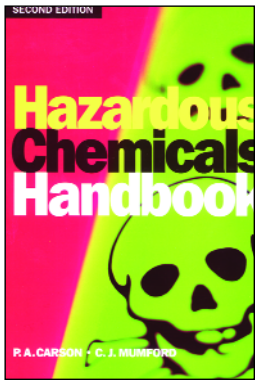
Hazardous Chemicals Handbook, 2nd ed.

P. A. Carson and C. J. Mumford, Butterworth Heinemann,Woburn, MA, 608 pp. $85.99, 2002



This handbook is written as an initial reference point for people who must manage hazardous chemicals safely. Although its regulatory emphasis pertains to legislation within the U. K., the principles and practices for managing risks when handling, using and disposing of hazardous chemicals are universal and are well addressed. The book is filled with many tables that provide useful property summaries and comparisons between many common types of materials and their hazards. References to additional resources are also included.

Everyone's goal when working with hazardous materials is to minimize the risk to people's health, to facilities, and to the environment. The first step in the risk analysis is to understand the material's hazard. The chapters in this handbook are arranged by hazard types, including toxic, flammable, reactive, radioactive, cryogenic and compressed gases. The second step is to understand how to monitor and safely handle the hazards. This handbook has chapters on monitoring techniques, safety by design, operating procedures, marketing, and transporting. Two specifically environmentally-focused chapters address the types of sources and their impact to air, water and land, and to environmental monitoring and protection protocols.

A 10-page terminology chapter provides excellent definitions that can be used to ensure that everyone "speaks the same language" when using terms such as "hazard" or "risk" and acronyms like "VOCs." The chapter discussing the general principles of chemistry summarizes the inherent hazards associated with the type of material. The chapter on physicochemistry provides excellent examples of potential fires, explosions, or toxic releases associated with materials when loss of control or containment occurs. Essentially, these examples reinforce how important it is for us to understand the material's inherent reactivity and its physical properties before we can define how to handle it safely.

Practical approaches to managing the risks relative to the hazards of the materials are sprinkled throughout this handbook. I will be referring to it as I develop and communicate our approaches to managing and handling our hazardous chemicals to ensure the safety of our employees, our facilities and our environment.

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