



METADATA

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Abstract

The book provides a concise yet systematic exposition of the methodologies for analysing and designing mass-transfer processes. The first part develops mass and energy balances and applies them to a variety of examples of industrial relevance. These examples serve as an informal introduction to the main physical processes. Transient balances are covered in a separate section and are combined with some preliminary ideas of automatic control. Next, the equilibrium thermodynamics of liquid/vapour mixtures are reviewed, followed by the description of mass transfer in multiphase systems. Thus, the necessary background for the analysis and design of physical processes is complete. In the second part of the book, the main physical processes are introduced.

Process equipment is classified according to the mode of contact of interacting streams, as multi-cascade or continuous. Fractional distillation of a binary mixture is analyzed as the representative example of the first category, and gas absorption in a packed column is an example of the second category. Humidification processes are considered next in significant detail because they are central to many engineering applications (cooling towers, air-conditioning, drying etc.) and serve as a paradigm of simultaneous heat and mass transfer. Finally, liquid-liquid extraction and gas adsorption to a porous solid are given introductory consideration, providing examples of additional processes that may be analyzed with similar engineering methodologies.

