Part One

Introduction

The purpose of this Part can be found in its title. The book itself offers the reader the fundamentals of mass transfer operations with appropriate practical applications, and serves as an introduction to the specialized and more sophisticated texts in this area. The reader should realize that the contents are geared towards practitioners in this field, as well as students of science and engineering, not chemical engineers per se. Simply put, topics of interest to all practicing engineers have been included. Finally, it should also be noted that the microscopic approach of mass transfer operations is not treated in any required undergraduate Manhattan College offering. The Manhattan approach is to place more emphasis on real-world and design applications. However, microscopic approach material is available in the literature, as noted in the ensuing chapters. The decision on whether to include the material presented ultimately depends on the reader and/or the approach and mentality of both the instructor and the institution.

A general discussion of the philosophy and the contents of this introductory section follows.

Since the chapters in this Part provide an introduction and overview of mass transfer operations, there is some duplication due to the nature of the overlapping nature of overview/introductory material, particularly those dealing with principles. Part One chapter contents include:

1 History of Chemical Engineering and Mass Transfer Operations
2 Transport Phenomena vs Unit Operations Approach
3 Basic Calculations
4 Process Variables
5 Equilibrium vs Rate Considerations
6 Phase Equilibrium Principles
7 Rate Principles

Topics covered in the first two introductory chapters include a history of chemical engineering and mass transfer operations, and a discussion of transport phenomena vs unit operations. The remaining chapters are concerned with introductory engineering principles. The next Part is concerned with describing and designing the various mass transfer unit operations and equipment.