

CONTENTS

<i>Preface</i>		
1. Mathematical Principles		1
Dimensions, Units, Labels, and Conversion Factors		1
Chemical Analyses		5
2. Chemical and Physical Principles		25
Chemical Formulas		25
Chemical Equations		27
Temperature		30
Pressure		33
The Perfect-gas Laws		39
3. Material Balances		62
Key Component		66
Simultaneous Equations		67
Bypass and Recycle		70
4. Energy Balances		83
The First Law		85
Types of Heat Effects		97
Heat Capacities		97
Thermochemistry		116
5. Unit Operations		154
Chemical Engineering		155
Unit Operations and Processes		156
Fundamentals		156
Classification of Unit Operations		157
Fluid Flow		158
Heat Transmission		159
Separation Operations		160
Summary		205
6. Chemical Processes		212
Combustion		213
Oxidation of Sulfur and Sulfur Compounds		242
Vinyl Acetate Manufacture		258
Postscript		277
Appendixes		279
Index		347