Draft
Table of Contents

BC Science Chemistry 12

1 Reaction Kinetics 1
- 1.1 Measuring the Rate of Chemical Reactions 2
- 1.2 Factors Affecting Rates of Reaction 18
- 1.3 Collision Theory 29
- 1.4 Potential Energy Diagrams 42
- 1.5 Reaction Mechanisms and Catalysis 57

2 Chemical Equilibrium 71
- 2.1 Introduction to Dynamic Equilibrium 72
- 2.2 Le Châtelier's Principle 83
- 2.3 How Equilibria Respond to Volume and Temperature Changes 96
- 2.4 Entropy Change versus Enthalpy Change 117
- 2.5 The Equilibrium Constant 130
- 2.6 Equilibrium Problems 146

3 Solubility Equilibrium 161
- 3.1 The Concept of Solubility 162
- 3.2 Qualitative Analysis — Identifying Unknown Ions 173
- 3.3 The Solubility Product Constant K_{sp} 189
- 3.4 Precipitation Formation and the Solubility Product K_{sp} 200

4 Acid-Base Equilibrium 215
- 4.1 Identifying Acids and Bases 216
- 4.2 The Strengths of Acids and Bases 226
- 4.3 The Ionization of Water 240
- 4.4 pH and pOH 247
- 4.5 Calculations Involving K_a and K_b 264

5 Applications of Acid-Base Reactions 285
- 5.1 Hydrolysis of Salts — The Reactions of Ions with Water 286
- 5.2 The Chemistry of Buffers 306
- 5.3 Acid-Base Titrations — Analyzing with Volume 326
- 5.4 A Closer Look at Titrations 347
- 5.5 Non-metal and Metal Oxides in Water 383

6 Oxidation-Reduction and Its Applications 399
- 6.1 Oxidation-Reduction 400
- 6.2 Balancing Oxidation-Reduction Equations 412
- 6.3 Using the Standard Reduction Potential (SRP) Table to Predict Redox Reactions 429
- 6.4 The Electrochemical Cell 444
- 6.5 The Electrolytic Cell 463

Appendix — Reference Tables 479

Answer Key 498