

Table of Contents

LABORATORY SAFETY	v
CLASS POLICIES	vi
WRITTEN REPORT GUIDELINES	viii

EXPERIMENTS

1. Introduction to Laboratory Techniques	1
2. Nomenclature and Reaction Stoichiometry	15
3. Analysis of Water	31
4. Determination of a Chemical Formula	41
5. The Molar Volume of Gases	51
6. Thermochemistry	63
7. Reaction Enthalpies and Hess's Law	77
8. Atomic Spectroscopy	89
9. Determination of Avogadro's Number	99
10. Colligative Properties: Freezing Point Depression	107
11. Kinetics: The Rate of a Chemical Reaction	117
12. Chemical Kinetics: Rate of Decomposition of Hydrogen Peroxide	135
13. Reaction Reversibility and Le Chatelier's Principle	151
14. Determination of an Equilibrium Constant Using a Spectrophotometer	167
15. Antacid Analysis and the Determination of the Percent Acetic Acid in Vinegar	179

16. Acid-Base Equilibria: Determination of Acid Ionization	
Constants	193
17. Recycling Aluminum	205
18. The Oxidation of Vitamin C	215
19. Oxidation-Reduction Electrochemistry	223
20. Thermodynamics of Electrochemical Cells	239
21. Synthesis of Transition Metal Complexes	249
22. Synthesis of Aspirin and Oil of Wintergreen	265
APPENDIX 1: Solubility of Ionic Compounds	A-3
APPENDIX 2: Vapor Pressure of Water	A-5
APPENDIX 3: Spectrophotometer	A-7
APPENDIX 4: Equipment	A-9
APPENDIX 5: Acid Ionization Constants	A-11