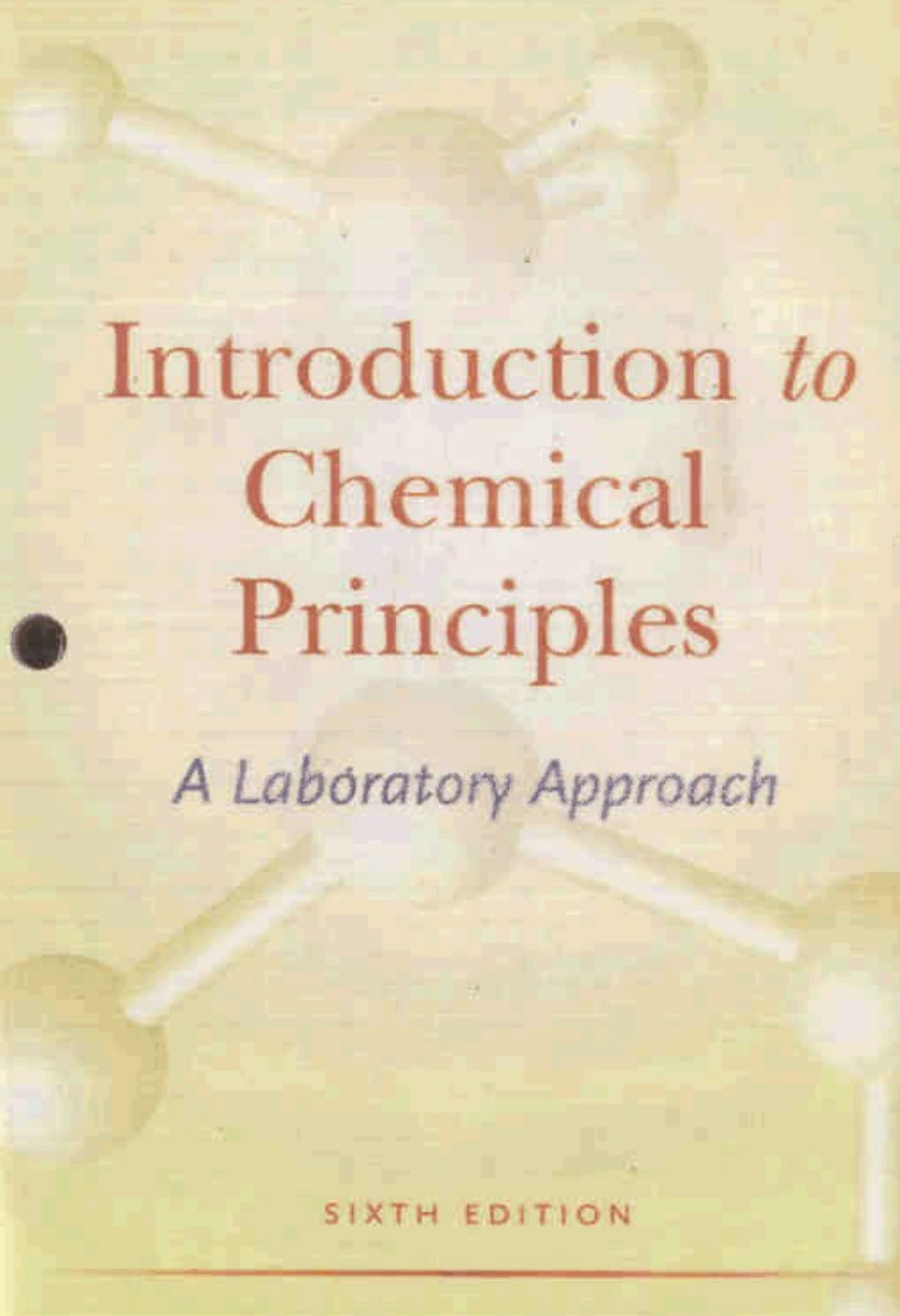


BROOKS/COLE LABORATORY SERIES *for*
Introductory Chemistry



Introduction *to*
Chemical
Principles

A Laboratory Approach

SIXTH EDITION

Susan A. Weiner



Contents

Preface	v
Safety in the Laboratory	1
Laboratory Procedures	5
Ⓜ Experiment 1 Properties and Changes of Matter	11
Experiment 2 Calibration of a Thermometer	21
Ⓜ Experiment 3 Separation of Cations by Paper Chromatography	31
Experiment 4 Densities of Liquids and Solids	41
Ⓜ Experiment 5 Simplest Formula of a Compound	55
Ⓜ Experiment 6 Hydrates	65
Experiment 7 Percentage of Oxygen in Potassium Chlorate	79
Experiment 8 Calorimetry	89
Experiment 9 Chemical Names and Formulas: A Study Assignment	99
Experiment 10 Chemical Equations: A Study Assignment	121
Ⓜ Experiment 11 Mole Ratio for a Chemical Reaction	141
Ⓜ Experiment 12 Types of Chemical Reactions	149

Ⓜ Experiment 13 Qualitative Analysis of Some Common Ions	159
Experiment 14 Separation of Cations	169
Experiment 15 Molecular Models: A Study Assignment	177
Ⓜ Experiment 16 Molar Volume of a Gas	187
Experiment 17 Molar Mass of a Volatile Liquid	197
Experiment 18 Molar Mass Determination by Freezing-Point Depression	207
Experiment 19 The Conductivity of Solutions: A Demonstration	223
Experiment 20 Net Ionic Equations: A Study Assignment	237
Ⓜ Experiment 21 The Chemistry of Some Household Products	255
Experiment 22, Experiment 23 Titration of Acids and Bases: An Introduction	265
Experiment 22 Titration of Acids and Bases—I	267
Experiment 23 Titration of Acids and Bases—II	279
Experiment 24 Determination of a Chemical Equation	287
Experiment 25 A Study of Reaction Rates	297
Ⓜ Experiment 26 Chemical Equilibrium	311
Experiment 27 Measurement of pH with Indicators	325
Ⓜ Experiment 28 Introduction to Oxidation–Reduction Reactions	335
Experiment 29 Hydrocarbons and Alcohols	345
Experiment 30 Aldehydes, Ketones, and Carboxylic Acids	355
Experiment 31 Preparation of Aspirin	365
Experiment 32 Preparation and Properties of a Soap	375

Experiment 33 Carbohydrates	383
Experiment 34 Amino Acids and Proteins	393
Worksheets Significant Figures	404
Dimensional Analysis	405
Avogadro's Number—Moles	406
Formula Writing	407
Equation Balancing—Types of Reactions	408
Stoichiometry	409
Atomic Structure	410
Gases	411
Solutions	412
Oxidation–Reduction	413
Acids and Bases	414
Appendix	415

Ⓜ indicates microscale (small scale) experiments