Advanced Chemistry Notes

Stasya

Fall 2022 & Spring 2023

Contents

1 Nature of Science

1.1 Lab Safety & Equipment

1.2 Matter, Energy, & Change

1.3 Measurement

1.4 Dimensional Analysis

2 Atomic Structure and Energy of Electrons

2.1 Atomic Theory & Structure

2.2 Structure of Atom & Isotopes

2.3 Average Atomic Mass

2.4 Moles

2.5 Electron Configuration

2.6 Ion Electron Configurations

2.7 EM Spectrum

3 Periodicity

3.1 Introduction to Periodic Table & Activity

3.2 Periodic Trends

4 Bonding and Compounds

4.1 Types of Bonds Overview

4.2 Ionic Nomenclature

4.3 Covalent & Acid Nomenclature

4.4 Mole Problems

4.5 Percent Composition

4.6 Empirical & Molecular Formulas

4.7 Oxidation Numbers

5 Reactions

5.1 Balancing Equations

5.2 Synthesis & Decomposition

5.3 Single Replacement, Double Replacement, & Combustion

5.4 Reaction Rates

5.5 Redox Reactions

5.6 Net Ionic Equations

6 Stoichiometry

6.1 Stoichiometry

6.2 Percent Yield, Limiting Reactant, & Gas and Solution Stoichiometry

7 VSEPR/IMFs

7.1 Types of Bonding

7.2 Bonding

8 States of Matter

9 Gas Laws

9.1 Kinetic Molecular Theory, Temperature, and Pressure

9.2 Gas Laws & Density

10 Solutions

10.1 Solutions, Colloids, Suspensions, Electrolytes & Solubility

10.2 Units of Concentration

10.3 Colligative Properties

11 Acids and Bases

11.1 Acids & Bases

11.2 Titrations

11.3 Molar Mass through Titrations

11.4 Acid-Base Equilibrium: Ka & Kb

12 Equilibrium

13 Thermochemistry

13.1 Enthalpy, Enthalpy of Reactions, Spontaneity

13.2 Hess's Law

13.3 Big Mama Equation

13.4 Reaction Spontaneity, Energy & Heat Transfer

13.5 Specific Heat

14 Nuclear Chemistry

15 Organic Chemistry