Advanced Chemistry Notes

Stasya

Fall 2022 & Spring 2023

Contents

1	Nature of Science	3
	1.1 Lab Safety & Equipment	
	1.2 Matter, Energy, & Change	
	1.3 Measurement	
	1.4 Dimensional Analysis	3
2	Atomic Structure and Energy of Electrons	4
	2.1 Atomic Theory & Structure	4
	2.2 Structure of Atom & Isotopes	4
	2.3 Average Atomic Mass	4
	2.4 Moles	
	2.5 Electron Configuration	
	2.6 Ion Electron Configurations	
	2.7 EM Spectrum	4
3	Periodicity	5
•	3.1 Introduction to Periodic Table & Activity	
	3.2 Periodic Trends	
4	Bonding and Compounds	6
	4.1 Types of Bonds Overview	
	4.2 Ionic Nomenclature	
	4.3 Covalent & Acid Nomenclature	
	4.4 Mole Problems	
	4.5 Percent Composition	
	4.7 Oxidation Numbers	
	T. Oxidation Numbers	0
5	Reactions	7
	5.1 Balancing Equations	7
	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	8
	6.1 Stoichiometry	
	6.2 Percent Yield, Limiting Reactant, & Gas and Solution Stoichiometry	8
_		_
7	VSEPR/IMFs	9
	7.1 Types of Bonding	
	7.2 Bonding	9
8	States of Matter	10
_		
9	Gas Laws	11
	9.1 Kinetic Molecular Theory, Temperature, and Pressure	
	9.2 Gas Laws & Density	11
10	Solutions	12
	10.1 Solutions, Colloids, Suspensions, Electrolytes & Solubility	
	10.2 Units of Concentration	
	10.3 Colligative Properties	12
	10.3 Colligative Properties	12

CONTENTS	
CONTENTS	

	11.1 Acids & Bases	13 13
12	11.4 Acid-Base Equilibrium: Ka & Kb	13 14
13	Thermochemistry	15
	13.1 Enthalpy, Enthalpy of Reactions, Spontaneity	15
	13.2 Hess's Law	
	13.3 Big Mama Equation	
	13.4 Reaction Spontaneity, Energy & Heat Transfer	
	13.5 Specific Heat	
14	Nuclear Chemistry	16
15	Organic Chemistry	17

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