

## AP Chemistry 2022-2023 Summer Assignment

### **Instructions:**

Obtain access to the following text – either hard copy or on-line version. For each chapter listed in the assignment, review the concepts, and work the practice exercises. Be prepared for a short assessment when we convene class this fall. Please contact me via email with any questions that you have.

[mheadlee@tka.net](mailto:mheadlee@tka.net)

***Chemistry – The Central Science. 14<sup>th</sup> edition. Brown and Lemay. Pearson***

### **Chapter 1:**

1. Concepts
  - a. Dimensional Analysis
  - b. Units of measure
  - c. Separation of mixtures
  - d. Compounds and mixtures
2. Exercises
  - a. p.35 ex. 1.1 and 1.2
  - b. p.37 ex. 1.23, 1.27, 1.35
  - c. p.39 ex. 1.63

### **Chapter 2:**

1. Concepts
  - a. Atomic structure
  - b. Atomic weights
  - c. Periodic table
  - d. Molecular and ionic compounds
  - e. Nomenclature of compounds
2. Exercises
  - a. p.75 ex. 2.4, 2.5, 2.8
  - b. p.77 ex. 2.29, 2.39
  - c. p.78 ex. 2.41

### **Chapter 3:**

1. Concepts
  - a. Combustion reactions
  - b. Formula weights
  - c. Avogadro's number and moles
  - d. % Composition
  - e. Empirical formulas from % composition
  - f. Stoichiometry and limiting reactant
2. Exercises
  - a. p.111 ex. 3.1, 3.5, 3.7
  - b. p.113 ex. 3.35
  - c. p.114 ex. 3.45
  - d. p.116 ex. 3.75

### **Chapter 4**

1. Concepts
  - a. Solutions
  - b. Precipitation reactions and solubility guidelines
  - c. Net ionic equations and spectators
  - d. Electrolytes
  - e. Acids, bases, and neutralization reactions
  - f. Redox reactions and rules for assigning oxidation numbers
  - g. Molarity – concentration of solutions
  - h. Solution stoichiometry
2. Exercises
  - a. p.154 ex. 4.1, 4.2
  - b. p.155 ex. 4.17
  - c. p.156 ex. 4.23, 4.39
  - d. p.157 ex. 4.49, 4.51, 4.61
  - e. p.159 ex. 4.87

### **Chapter 5**

1. Concepts
  - a. Enthalpies of reaction
  - b. Calorimetry
  - c. Enthalpy of formation
2. Exercises
  - a. p.205 ex. 5.41, 5.51
  - b. p.206 ex. 5.55
  - c. p.207 ex. 5.73

## **Chapter 6**

1. Concepts
  - a. Electromagnetic spectrum
  - b. Representations of orbitals
  - c. Electron configurations and orbital diagrams
2. Exercises
  - a. p.252 ex. 6.73, 6.75

## **Chapter 7**

1. Concepts
  - a. Effective nuclear charge
  - b. Atomic and ionic radii
  - c. Periodic trends in
    - i. Atomic and ionic radii
    - ii. First ionization energies and successive ionization energies
  - d. Properties of metals, non-metals, and semimetals
2. Exercises
  - a. p.290 ex. 7.7
  - b. p.292 ex. 7.25, 7.33, 7.39
  - c. p.293 ex. 7.41, 7.43

## **Chapter 8**

1. Concepts
  - a. Chemical bonding
  - b. Ionic bonding and lattice energy
  - c. Covalent bonding
  - d. Bond polarity and electronegativity
  - e. Lewis structures
2. Exercises
  - a. p.329 ex. 8.1, 8.2

- b. p.330 ex. 8.4, 8.17
- c. p.331 ex. 8.39, 8.41

## **Chapter 9**

1. Concepts
  - a. Molecular shapes
  - b. VSEPR model
  - c. Shape and polarity
2. Exercises
  - a. p.386 ex. 9.25 a-b, 9.29
  - b. p.387 ex. 9.41 a-d

## **Chapter 10**

1. Concepts
  - a. Gas laws
    - i. Boyle's
    - ii. Charles'
    - iii. Avogadro's
    - iv. Combined
    - v. Ideal
    - vi. Dalton's
    - vii. Graham's
    - viii. STP
  - b. Stoichiometry
  - c. KMT
2. Exercises
  - a. p.424-425 ex. 10.2, 10.7
  - b. p.426 ex. 10.19, 10.23
  - c. p.427 ex. 10.33
  - d. p.428 ex. 10.57

## **Chapter 11**

1. Concepts
  - a. Intermolecular forces
  - b. Heating curves
2. Exercises
  - a. p.463 ex. 11.1, 11.2
  - b. p.464 ex. 11.15
  - c. p.465 ex. 11.26