**Unit 4 Guide: Bonding and Intermolecular Forces**

December 2nd – December 12th (9 days)

AP Chemistry

**Unit objectives:**

**Week 1: Bonding**

**By the end of week 1 (12/2 – 12/6), you will be able to...**

* Compare and contrast the properties of different types of compounds (ionic, molecular, network, and metallic) (Chapter 12, 12.1-12.7)
* Explain properties resulting from the “electron sea” model of metallic compounds (12.3 – 12.4)
* Draw Lewis dot diagrams (including resonance structures) for different compounds (8.5 – 8.7)
* Determine the formal charge on an atom in a molecule (8.7)
* Determine the VSEPR geometry of different molecules (9.1 – 9.3)
* Explain hybridization and predict the type of hybridization present in a given bond. (9.4 – 9.7)
* Explain how Coulomb’s Law applies to concepts of ionic bonding. (12.5)

**Week 2: Intermolecular Forces**

**By the end of week 2 (11/18 – 11/22), you will be able to...**

* Determine the polarity of a bond or molecule. (9.3)
* Compare and contrast four types of intermolecular forces: London dispersion forces, dipole-dipole interactions, hydrogen bonding. (11.2 – 11.4)
* Draw diagrams of intermolecular forces using Lewis dot diagrams and dotted lines
* Explain how intermolecular forces relate to: boiling point, freezing point, solubility. (11.3 – 11.4)
* Use knowledge of intermolecular forces to predict the relative boiling points, freezing points, or solubility of different compounds. (11.3 – 11.4)
* Interpret a phase diagram for a given substance. (11.6)

**Assigned reading and problems from Brown and Lemay:**

 **Chapter 8,** all sections (pgs. 289 – 320)

**Problems:** 8.1 – 8.13 odds, 8.17, 8.21, 8.23, 8.24, 8.25, 8.31, 8.33, 8.34, 8.41, 8.45, 8.47, 8.51, 8.53, 8.57, 8.58

 **Chapter 9,** all sections\* (pgs. 331 – 372)

\*NOTE: we will BRIEFLY cover these topics. Use the problems to review, but you do not have to know this chapter in detail.

 **Problems:** 9.11, 9.13, 9.19, 9.21, 9.25, 9.29, 9.30, 9.31, 9.47, 9.51, 9.55, 9.63, 9.67

 **Chapter 11,** sections 11.1 – 11.4, 11.6 (pgs. 425 – 442, 445 – 448)

**Problems:** 11.9, 11.11, 11.12, 11.15, 11.16, 11.19, 11.20, 11.21, 11.23, 11.25, 11.37, 11.57, 11.61, 11.62

 **Chapter 12,** sections 12.1 – 12.8 (pgs. 463 – 496)

 Problems: 12.43, 12.47, 12.49, 12.63, 12.65

**Lab:** **Phase changes and Intermolecular Forces lab**

**Description:** You will compare the relative boiling points of different compounds, and rank them by the strength of their intermolecular forces.