

## Unit 5: Bonding and Chemical Compounds

1. Define
  - a. compound
  - b. molecule
  - c. chemical bond
2. Define each type of chemical bond and explain the forces that hold each one together:
  - a. ionic
  - b. polar covalent
  - c. nonpolar covalent
  - d. metallic
  - e. hydrogen
3. State any known properties of the bonds listed above.
4. Compare and contrast each type of chemical bonding.
5. What about the structure of an ionic bond is special? What causes this?
6. What about the structure of a metallic bond is special? What causes this?
7. What about the structure of a covalent bond is special? What causes this?
8. Can you **always** predict the oxidation state of an element by using the periodic table?
  - a. If so, how?
    - i. Is there a pattern?
    - ii. Are there exceptions to this pattern?
  - b. If not **always**, can you sometimes predict?
    - i. Which ones?
    - ii. Are there ways to discover oxidation states of exceptions?
9. Which elements are naturally diatomic?
10. IUPAC Nomenclature (Don't forget polyatomics!)
  - a. Be able to name or provide the formula for ionic compounds such as
    - i. KCl
    - ii. CaO
    - iii. PbS
    - iv. silver I phosphide
    - v. magnesium bromide
  - b. Be able to name or provide the formula for covalent molecules such as
    - i. NS
    - ii. CBr<sub>4</sub>
    - iii. BF<sub>3</sub>
    - iv. phosphorous pentachloride
    - v. diphosphorous pentoxide
  - c. Be able to name acids and bases as well as provide the formula such as
    - i. HCl
    - ii. HClO<sub>3</sub>
    - iii. NaOH
    - iv. Ba(OH)<sub>2</sub>
    - v. sulfurous acid
    - vi. nitric acid

- vii. hydroiodic acid
- viii. lead II hydroxide
- ix. tin IV hydroxide

11. VSEPR

- a. Be able to explain why we use this and what it tells us about molecular shape
  - i. What contributes to shape the most? Why?
  - ii. How does it help us determine shape?
  - iii. When can this be used?
- b. Be able to use this and provide the VSEPR information given a chemical formula.

12. Remember to review your old tests and quizzes to stay up to date with “old” information including but not limited to

- a. KMT
- b. Matter
- c. Atomic structure
  - i. History of the atom and discovery of its parts
  - ii. Current model
- d. Periodic table and trends