

## CHE 101 Chapter 2 - Study Guide

**Terms:** Chemistry, Hypothesis, Theory, Scientific Law, Scientific Method, Matter, Solid, Liquid, Gas, Phase, Amorphous, Homogeneous, Heterogeneous, Pure Substance, and Mixtures, Elements, Compounds, Ionic, Molecular, Covalent, Anion, Cation, Metal, Non-metal, Metalloid, Alkali metals, Alkaline earth metals, Halogens, Noble gases, Transition elements, Representative elements.

1. General understanding of the scientific method and Qualitative Observations – Categorizing matter based on its characteristics
2. Define, Compare, Contrast and Differentiate between:
  - a. Solids, liquids, and gases based on shape, volume, particle interactions, and compressibility, and energy.
  - b. Pure substances (Elements and Compounds) and Mixtures
    1. Physical vs. Chemical Separation
    2. Fixed vs. Variable Composition
  - c. Homogeneous and Heterogeneous
    1. One phase vs. two phases
    2. Same properties (chemical and physical) throughout vs. different properties in different parts.
3. Periodic Table
  - a. Know the Properties of Metals vs. Non-metals.
  - b. Memorize the 7 metalloids (B, Si, Ge, As, Sb, Te, Po/At)
  - c. Identify metals, metalloids, and non-metals.
  - d. Memorize the 7 diatomic elements.
  - e. Memorize the 2 liquid elements.
  - f. Memorize the 11 gaseous elements.
  - g. Memorize location of alkali metals, alkaline earth metals, halogens, noble gases, transition elements, representative elements.
4. Define and differentiate between:
  - a. Elements and Compounds
  - b. Elements, Compounds and Mixtures
  - c. Ionic and Molecular/Covalent compounds
    1. Molecules vs. Lattice
    2. Share  $e^-$  vs. Gain/lose  $e^-$
    3. Nonmetal-nonmetal vs. Metal-nonmetal
    4. Does not conduct electricity vs. Conduct electricity
    5. Weak bonds vs. Strong bonds
5. Chemical Formula's
  - a. Understand the notation and symbols used in chemical formula's and what they represent.
  - b. Lower case vs. upper case.
  - c. Subscripts = number of atoms in the molecule.
  - d.  $()$  = group of atoms, subscripts outside the  $()$  apply to all elements inside the  $()$ .
  - e. Numbers in front = how many molecules you have.
6. Define and differentiate between
  - a. Physical and Chemical Properties
  - b. Physical and Chemical Changes

