**Quiz 2**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. Argon has a larger average atomic mass than potassium, yet it is placed before potassium in the modern periodic table. Explain (3 points).

Despite being heavier (on average), argon contains 18 protons, whereas potassium contains 19 protons. Since the modern periodic table is organized by increasing atomic number, argon is place before potassium.

1. Does the sum of the masses of the products always equal the sum of the masses of the reactants in a balanced chemical equation (3 points)?

Yes, if the masses were unequal, then the equation would be missing either some reactants or products.

1. Identify each reaction by what **type of chemistry** is occurring (4 points):
   1. Fe2O3 (s) + 3 H2SO4 (aq) → 3 H2O (l) + Fe2(SO4)3 (aq) \_\_\_\_precipitation rxn
   2. 2 LiCO3 (s) Li2O (s) + 2 CO2 (g) \_\_\_\_\_\_gas evolution rxn
   3. 2 C8H18 (l) + 25 O2 (g) → 16 CO2 (g) + 18 H2O (l) \_\_\_combustion rxn
   4. Zn (s) + 2 HCl (aq) → H2 (g) + ZnCl2 (aq) \_\_\_\_oxidation-reduction rxn
2. Identify each reaction by what **the atoms are doing** is occurring (4 points):
   1. Fe2O3 (s) + 3 H2SO4 (aq) → 3 H2O (l) + Fe2(SO4)3 (aq) \_\_\_\_double displacement rxn
   2. 2 LiCO3 (s) Li2O (s) + 2 CO2 (g) \_\_\_\_\_\_decomposition rxn
   3. 2 C8H18 (l) + 25 O2 (g) → 16 CO2 (g) + 18 H2O (l) \_\_\_combustion rxn
   4. Zn (s) + 2 HCl (aq) → H2 (g) + ZnCl2 (aq) \_\_\_\_single replacement rxn
3. In each case, decide if the underlined property is a physical or chemical property (6 points).
   1. The color of elemental bromine is orange-red. \_\_\_physical property
   2. Iron turns to rust in the presence of air and water. \_\_\_chemical property
   3. Hydrogen can explode when ignited in air. \_\_\_chemical property
   4. The density of titanium metal is 4.5 g/cm3. \_\_\_physical property
   5. Tin metal melts at 505 K. \_\_\_physical property
   6. Chlorophyll, a plant pigment, is green. \_\_\_physical property
4. Are the following statements true or false (2 points)?
   1. Ammonium compounds are generally soluble. \_\_\_\_\_true
   2. Phosphate compounds are generally soluble. \_\_\_\_\_false
5. What is the equation that you use to calculate percent recovery (2 points)?