Unit 3 – Chapter 3: Stoichiometry **Name _____**

Assignment #1: Mole, Atom, Mass Conversions **Period _____**

1) Calculate the mass of 500.0 atoms of iron (Fe).

2) What number of Fe atoms and what amount (moles) of Fe atoms are in 500.0 g of iron?

3) The molecular formula of acetylsalicylic acid (aspirin), one of the most commonly used pain relievers, is $C_9H_8O_4$.
   a. Calculate the molar mass of aspirin.
   b. A typical aspirin tablet contains 500.0 mg of $C_9H_8O_4$. What amount (moles) of $C_9H_8O_4$ molecules and what number of molecules of acetylsalicylic acid are in a 500.0 mg tablet?

4) What number of atoms of nitrogen are present in 5.00 g of each of the following?
   a. glycine, $C_2H_5O_2N$
   b. magnesium nitride
   c. calcium nitrate
   d. dinitrogen tetroxide

5) Chloral hydrate ($C_2H_3Cl_3O_2$) is a drug formerly used as a sedative and hypnotic. It is the compound used to make "Mickey Finns" in detective stories.
   a. Calculate the molar mass of chloral hydrate.
   b. What amount (moles) of $C_2H_3Cl_3O_2$ molecules are in 500.0g chloral hydrate?
   c. What is the mass in grams of 2.0×10^{-2} mol chloral hydrate?
   d. What number of chlorine atoms are in 5.0 g chloral hydrate?
   e. What mass of chloral hydrate would contain 1.0 g Cl?
   f. What is the mass of exactly 500 molecules of chloral hydrate?