Honors Chemistry Mole Review

Focus Learning Target
(1) Define the quantity one mole by stating Avogadro's number.
(2) Determine the number of atoms of each element in a given compound from the chemical formula.
(3) Define molar mass. Determine molar mass for a given element/compound with the appropriate units.
(4) Perform conversions between moles, mass, and atoms/molecules and solve problems involving these quantities, giving answers with the appropriate units and significant figures.
(5) Name and write formulas for hydrates.
 (6) Determine the percent composition for a compound from the chemical formula. Determine the percent composition of water in a hydrate.
 (8) Determine the empirical formula and molecular formula for a compound from percent composition or mass information

1. Define a mole and fill in the following table

	Type Of Particles	Formula	Molar Mass	# Particles in a mole
Gold				
Sulphur Trioxide tetrachloride				
Sulphuric acid				
Oxygen Gas				

Mole Conversions:
Please make sure all answers include proper units and the correct number of sig figs
2. What is the mass of one mole of potassium sulfate?

3. What is the mass of 0.500 moles of Iron?

4. What is the volumes of 0.5 moles of helium @ STP?

5. What is the volume of a 35.0 gram sample of nitrogen trioxide at STP?

6. How many moles of silver is 2.04 x 10^{23} atoms of silver?

7. How many formula units (For ionic compounds) of potassium bromide are in a 30.0 gram sample?

8. How many atoms of hydrogen are in a 15.0 gram sample of CH_4 ?

9. How many grams does a sample of carbon monoxide gas that occupies a volume of 450.0mL at STP weigh? What is the density of the gas at STP?

10. Find the percentage composition:

a. Find the percentage composition of sucrose ($C_6H_{12}O_6$).

b. Find the percentage composition of oxygen in KNO_3

11. Empirical and Molecular formula problems.(Refer to your notes and empirical formula worksheet)

1. Find the empirical formula of a compound that contains 75% carbon and 25% hydrogen. Ans: **CH_4**

c. Find the empirical formula of a compound that contains 9.03 g magnesium and 3.48 g of nitrogen.
   Ans: Mg_3N_2

2. The empirical formula of a compound is NO_2. Its molecular mass is 92 g/mol. What is its molecular formula? **Ans: N_2O_4**

3. Glucose has an empirical formula of CH_2O. Find its molecular formula if its molecular mass is 180.0 g/mol. **Ans: $C_6H_{12}O_6$**

d. A compound is composed of 34.2% sodium, 17.7% carbon, and 47.6% oxygen. Find its empirical formula. If its molecular mass is 134 g/mol, find its molecular formula.
   Ans: empirical: $NaCO_2$ molecular: $Na_2C_2O_4$

Good Luck!!!!