**VOCABULARY:** Fill in the blanks with the most appropriate term.

a. ________________ is also called Avogadro’s number. The mass of one mole of any pure substance is called the ________________ mass. For any element, this mass is equal to the atomic mass with the unit ________________ / ________________.

b. The ________________ formula of a compound is the simplest whole number ratio of atoms, while the ________________ formula of a compound represents the actual number of each atom in the compound.

c. ________________ are compounds that crystallize from a water solution with water molecules clinging to the crystal particles.

**PROBLEMS:** Work each of the following problems, showing all work. These problems are representative of each type of problem worked in this unit. For more practice on a given type of problem, refer back to note-taking guides, worksheets, and quizzes.

1. Calculate the molar mass for ethane, C_2H_6.

2. Convert 45 g Se to moles of Se.

3. Convert 4.77 \times 10^{24} molecules of SO_2 to grams?
4. What is the percentage composition of sodium hydroxide, NaOH?

5. A compound is found to contain 63% manganese, Mn, and 37% oxygen. What is the compound's empirical formula?

6. What is the empirical formula for a substance if a 1.000 g sample of it contains 0.262 grams of nitrogen, 0.075 grams of hydrogen, and 0.663 grams of chlorine?

7. What is the molecular formula for a compound with an empirical formula of NO₂ and a molar mass of 92.0 g/mol?