

## Chapter 6: Standard Review Worksheet

1. Express the atomic mass unit in grams. Why is the average atomic mass for an element typically *not* a whole number?
2. What does one mole of a substance represent on a microscopic, atomic basis? What does one mole of a substance represent on a macroscopic, mass basis?
3. Define *molar mass*. Calculate the molar mass of  $\text{H}_3\text{PO}_4$  from the atomic masses of the elements.
4. Describe in general terms how percent composition by mass is obtained by experiment for new compounds. How can this information be calculated for known compounds?
5. For 5.00-g samples of each of the following substances, calculate the number of moles of the substance present, as well as the number of atoms of each type present in the sample:
  - a.  $\text{K}_2\text{CrO}_4(s)$
  - b.  $\text{AuCl}_3(s)$
  - c.  $\text{SiH}_4(g)$
  - d.  $\text{Ca}_3(\text{PO}_4)_2(s)$
6. For the compounds in question 5, calculate the percent by mass of each element present in the compounds.
7. What does an empirical formula tell us about a compound? A molecular formula? What information must be known for a compound to calculate its molecular formula?
8. An oxide of iron is found to be 70.0% iron by mass. Determine the empirical formula for this compound and name it.
9. A compound that consists of nitrogen and oxygen is found to be 30.4% nitrogen by mass. The molar mass of this compound is between 90 and 100 g/mol. Determine the empirical and molecular formulas for this compound.