## Review for Unit 3B: Moles Test

1. How many hydrogen atoms are in a molecule of each substance?
   1. Al(OH)3 c. (NH4)2HPO4
   2. H2C2O4 d. C4H10O
2. Which contains more molecules: 1.00mol of H2O2, 1.00mol C2H6, or 1.00mol CO?
3. Which of the substances in #2 has the highest mass?
4. Calculate the molar mass of each substance.
   1. H3PO4 c. C4H9O2
   2. N2O3 d. (NH4)2SO4
5. How many moles is in each of the following?
   1. 15.5g SiO2
   2. 0.0688g AgCl
6. Find the mass, in g, of each substance.
   1. 0.780 mol Ca(CN)2
   2. 7.00 mol H2O2
7. Calculate the volume of each of the following gases at STP.
   1. 7.6 mol Ar
   2. 0.44 mol C2H6
8. How many moles is in each of the following gases at STP?
   1. 14.4 L F2
   2. 3.21 × 102 L CO2
9. Find the number of molecules in each substance.
   1. 3.00 mol Sn
   2. 0.400 mol KCl
10. How many moles are in each substance?
    1. 4.80 × 1020 molecules of NaI
    2. 7.50 × 1024 molecules of SO2
11. Find each of the quantities below:
    1. The volume, in liters, if 835g of sulfur trioxide gas at STP
    2. The mass, in grams, of a molecule of aspirin, C9 H8O4
    3. The number of molecules in 146 L of O3 gas at STP.
    4. The mass of 0.935 L of carbon monoxide gas at STP.
    5. The number of formula units of 29.30g of iron (III) carbonate
12. Find the % of each element in the substances:
    1. H2S
    2. Mg(OH)2
13. Calculate the empirical formula for the following substances:
    1. A compound containing 79.8% C and 20.2% H
    2. A compound, called 1,6-diaminohexane, is used to make nylon. Its composed of 62.1% C, 13.8% H, ad 24.1% N.
14. What is the molecular formula for each compound? Each compound’s empirical formula and the molecular mass formula are given.
    1. CH2O, 90g/mol
    2. HgCl, 472.2g/mol
15. Determine the molecular formula for a compound called methyl butanoate, which smells like apples. Its percent composition is 58.8% C, 9.8% H, and 31.4% O. Methyl butanoate’s molecular mass is 102g/mol.
16. The scent of cinnamon comes from the organic molecule cinnamaldehyde. Cinnamaldehyde has the following composition: 81.78% carbon, 6.1133% hydrogen, ad 12.1056% oxygen. The molecular mass is about 132 g/mol. Determine the molecular formula.