**Review Package #1**

|  |  |
| --- | --- |
| 1) | Write the chemical formulae resulting from the combination of the following ions. |
| a) Na+ | O2- | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | c) Sr2+ | Br- | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| b) Au3+ | S2- | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | d) Pb4+ | C2O42- | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 2) | Write the correct name for each of the following ionic compounds. |  |
| a) Li2O | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | c) Mg3N2 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| b) CoCl3 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | d) Cr3(PO4)2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 3) | Write the correct formula for each of the following ionic compounds. |  |
| a) | Cesium iodide |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | d) | Aluminum oxide | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| b) | Strontium cyanide | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | e) | Iron (III) hydroxide | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| c) | Copper (I) bicarbonate | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | f) | Potassium permanganate \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

4) Write the correct name for each of the following ionic hydrates.

* 1. Cd(NO3)2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. NaSCN \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Molecular Compounds:

1. Write the correct name for each of the following molecular compounds.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a. | NF3 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | d. | N2O4 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| b. | CO2 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | e. | SCl6 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| c. | P2O5 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | f. | N2O | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

2. Write the correct formula for each of the following molecular compounds

|  |  |  |  |
| --- | --- | --- | --- |
| a. Silicon disulphide | \_\_\_\_\_\_\_\_\_\_\_ | d. Triarsenic pentabromide \_\_\_\_\_\_\_\_\_\_\_ |  |
| b. Carbon tetrachloride | \_\_\_\_\_\_\_\_\_\_\_ | e. Dicarbon hexahydride | \_\_\_\_\_\_\_\_\_\_\_ |  |
| c. Oxygen gas | \_\_\_\_\_\_\_\_\_\_\_ | f. Iodine heptachloride | \_\_\_\_\_\_\_\_\_\_\_ |  |

Mixed Naming:

3.Write the correct name for each of the following molecular compounds:

a) CaBr \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) H2SO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) ICI \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d) Cu(NO3)2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**The Mole:**

Make the following conversions, clearly showing your steps. Include proper units in all of your work and in your answer.

a) 133.44 grams of PCl5 = ? moles

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) 0.00256 moles of Li2Cr2O7 = ? grams

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) 170.24 L of NO2 at STP = ? moles

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d) 570.625 g of PCl3 gas = ? L (STP)

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e)1030.4 mL of C2H6 gas at STP = ? g

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

f) 5.00 kg of nitrogen gas = ? L (STP)

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

g) 0.5696 kg of CH4(g) = ? mL

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. The density of liquid ethanol (C2H5OH) is 0.790 g/mL. Calculate the number of molecules in a 35.0 mL sample of liquid ethanol. (NOTE: You CAN’T use 22.4 L/mol since this is NOT a gas at STP!)

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. A 100.0 mL sample of liquid mercury contains 6.78 moles. Calculate the density of liquid mercury from this data.

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Calculate the density of PCl3(g) at STP.

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. a) The density of a gas at STP is 4.955 g/L. Calculate the molar mass of this gas.

 b) The gas is an oxide of selenium. Determine the molecular formula.

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Find the percent composition (% by mass of each element) in the following compound:
 Sr3(PO4)2. Show your work.

 Answer \_\_\_\_\_\_%Sr, \_\_\_\_\_\_%P, \_\_\_\_\_\_%O

7. A compound was analyzed and the following results were obtained:

 Molar mass: 270.4 g/mol

Mass of sample: 162.24 g
Mass of potassium: 46.92 g
Mass of sulphur: 38.52 g
Mass of oxygen: the remainder of the sample is oxygen

 a) Determine the mass of oxygen in the sample.

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b) Determine the empirical formula for this compound.

 Answer: Empirical Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 c) Determine the molecular formula for this compound.

 Answer: Molecular Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. 123.11 g of zinc nitrate, Zn(NO3)2 are dissolved in enough water to form 650.0 mL of solution. Calculate the [Zn(NO3)2]) Include proper units in your work and in your answers.

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. Calculate the mass of potassium sulphite (K2SO3) needed to make 800.0 mL of a
0.200 M solution of K2SO3. Include proper units in your work and in your answers.

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. What volume of 2.50 M Li2CO3 would need to be evaporated in order to obtain 47.232 g of solid Li2CO3? Include proper units in your work and in your answers.

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. 150.0 mL of water are added to 400.0 mL of 0.45 M HNO3 . Calculate the final [HNO3].
Include proper units in your work and in your answers.

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. What volume of water needs to be added to 150.0 mL of 4.00 M H2SO4 in order to bring the concentration down to 2.50 M? Include proper units in your work and in your answers.

 Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. Give directions on how to make 5.00 L of 0.020 M Ca(ClO)2 using solid Ca(ClO)2 and water. Include proper units in your work and in your answers.