**Molarity and Hydrates Homework**

For each of the following problems, use proper units and show ALL work:

1. If 10.7 grams of NH4Cl is dissolved in enough water to make 800. mL of solution, what will be its molarity? (Answer: 0.25 mol/L).
2. Calculate the molarity of a solution prepared by dissolving 6.80 grams of AgNO3 in enough water to make 2.50 liters of solution. (Answer: 0.016 mol/L).
3. How many moles of CaCl2 are required to prepare 2.00 liters of 0.700 M CaCl2? (Answer: 1.4 moles).
4. What mass, in grams, of CaCl2 will be required to prepare the above solution? (Answer: 155 grams).
5. How many grams of KNO3 will be required to prepare 800. mL of 1.40 M KNO3? (Answer: 113 grams).
6. Calculate the volume of a 1.25 M solution of HCN made from 31.0 grams of HCN. (Answer: 0.919 Liters).
7. Calculate the volume of a 3.50 molar solution of H2SO4 made from 49.0 grams of H2SO4. (Answer: 0.143 Liters).
8. How many sugar molecules are present in 300. mL of a 2.0 M solution? (The formula forsugar is C12H22O11) (Answer: 3.6 x 1023 molecules).
9. Your teacher asks you to prepare 500. mL of a 2.75 molar solution of NaCl for an upcoming laboratory experiment. Write a step-by-step procedure describing how you would carry out this task.
10. Name the following hydrates:
11. Na3PO4• 5 H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. CaSO4 • 2 H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
13. MgSO4 • H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
14. Mn(NO3)2 • 4 H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Write the formulas of the following hydrates:

1. magnesium nitrate hexahydrate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. iron (II) sulfate heptahydrate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. copper (II) nitrate trihydrate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. tin (II) chloride dihydrate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. What is the formula for a hydrate that is 90.7g SrC2O4 and 9.30g H2O? (C2O4-2 = oxalate)

formula of hydrate = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ name of hydrate = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. What is the formula of a hydrate that is 86.7% Mo2S5 and 13.3% H2O?

formula of hydrate = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ name of hydrate = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Molarity Homework #2**

1. Determine the molarity of the solution containing 1.5 mol of NaOH in 1000 mL total volume of solution. (1.5M NaOH)

2. Determine the molarity of the solution containing 0.4 mol of NaOH in 100 mL total volume of solution. (4 M NaOH)

3. Determine the molarity of the solution containing 1.5 mol of KNO3 in 250 mL total volume of solution. (6 M KNO3)

4. Determine the molarity of the solution containing 2.4 mol of KI in 140 mL total volume of solution. (17.1 M KI)

5. Determine the number of moles of NaOH in 500 mL of a 0.6 M NaOH solution. (0.3 mol NaOH)

6. Determine the number of moles of NaCl in 100 mL of a 1.2 M NaCl solution. (0.12 mol NaCl)

7. Determine the number of moles of FeSO4 in 200 mL of a 0.8 M FeSO4 solution. (0.16 mol FeSO4)

8. Determine the number of moles of HI in 100 mL of a 1.2 M HI solution. (0.12 mol HI)

9. What is the volume of 0.5 M NaI needed to have 0.25 mol NaI? (0.5 L NaI)

10. What is the volume of 5.0 M KBr needed to have 1.0 mol KBr? (0.2 L KBr)

11. How many grams of LiOH is needed to make 250 mL of a 0.33 M LiOH solution? (1.98 g LiOH)

12. How many grams of Ca(NO2)2 is needed to make 800 mL of a 2.0 M Ca(NO2)2 solution? (211.36 g Ca(NO2)2)

13. How do you prepare 1.0 L of a 4.0 M KOH solution?\* (224.44 g KOH)

14. How do you prepare 250 mL of a 0.2 M NaI solution?\* (7.49 g NaI)

\*-when preparing a solution, you do not use moles of a solute, you use grams.