Concentration Problems

Name:_____
Date:_____Per:_____

Directions: complete the following problems using the formulas below.

$$M = \frac{mol\ of\ solute}{L\ of\ solution} \qquad m = \frac{moles\ of\ solute}{kilogram\ of\ solution} \qquad M_1V_1 = M_2V_2$$

1. How many moles of solute would be required to prepare 1L of a 2.5M HCl solution?

2. How many moles of each solute would be required to prepare 150.0mL of a 1.250M Al(NO_3)_3 solution?

3. Determine the number of grams of solute needed to make 1.00L of a 3.50M solution of H_2SO_4.

4. Determine the number of grams of solute needed to make 2.500L of a 1.750M solution of Ba(NO_3)_2.

5. Determine the molarity of 20.0g NaOH dissolved in 2.0L of solution.

6. Determine the molarity of 14.0g NH_4Br in 150.0mL of solution.

7. What is the volume of a 1.5M solution containing 2.74moles of CUSO_4?

8. What is the volume of a 0.75M solution containing 40.0g of $Ca(OH)_2$?

9. Determine the molality of a solution formed by dissolving 45g of NH_4Cl in 1.5kg of water.

10. Determine the molality of a solution formed by dissolving 25.0g of NaCl in 350.0g of water.

11. The initial volume of a 2.50M solution of HCl is 500.0mL. What would the new concentration be if 7500mL of water were added?

12. The initial volume of a 2.50M solution of HCl is 500.0 mL. What volume of water should be added to the initial solution in order to obtain a concentration of 0.750M?