# Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hour: \_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_

# Chemistry: *Molarity of Solutions*

*Directions: Solve each of the following problems. Show your work and include units for full credit.*

1. What mass of the following chemicals is needed to make the solutions indicated?

a. 1.0 liter of a 1.0 M mercury (II) chloride (HgCl2) solution

b. 2.0 liters of a 1.5 M sodium nitrate (NaNO3) solution

c. 5.0 liters of a 0.1 M Ca(OH)2 solution

d. 100 mL of a 0.5 M (NH4)3PO4 solution

2. Calculate the molarity of the following solutions.

a. 12 g of lithium hydroxide (LiOH) in 1.0 L of solution

b. 198 g of barium bromide (BaBr2) in 2.0 L of solution

c. 54 g of calcium sulfide (CaS) in 3.0 L of solution

3. Calculate the volume of each solution, in liters.

a. a 1.0 M solution containing 85 g of silver nitrate (AgNO3)

b. a 0.5 M solution containing 250 g of manganese (II) chloride (MnCl2)

c. a 0.4 M solution containing 290 g of aluminum nitrate (Al(NO3)3)

Answers: 1a. 272 g HgCl2 2a. 0.50 M LiOH (aq) 3a. 0.50 L AgNO3 (aq)

1b. 255 g NaNO3 2b. 0.33 M BaBr2 (aq) 3b. 4.0 L MnCl2 (aq)

1c. 37 g Ca(OH)2 2c. 0.25 M CaS (aq) 3c. 3.4 L Al(NO3)3 (aq)

1d. 7.5 g (NH4)3PO4

4. How many grams of potassium chloride (KCl) are required to make 2.0 L of a 3.0 M solution?

5. How many grams of magnesium chloride (MgCl2) are needed to make 6.0 L of a 3.0 M solution?

6. What mass of barium chloride (BaCl2) is needed to make 0.5 L of a 4.0 M solution?

7. What mass of iron (II) sulfate (FeSO4) is needed to make 200 mL of a 0.25 M solution?

8. What is the molarity of a solution in which 1.6 g of sodium hydroxide (NaOH) are dissolved in 125 mL of solution?

9. What is the molarity of a solution in which 5.0 g of sodium carbonate (Na2CO3) are dissolved in 200 mL of solution?

10. How many grams of silver nitrate (AgNO3) are needed to make 2.0 L of a 0.10 M solution?

11. 2.0 L of a solution contain 25 g of potassium permanganate (KMnO4). What is the molarity of the solution?

12. How many grams of glycerine (C3H8O3) are needed to make 100 mL of a 2.5 M solution?

13. What is the molarity of a solution containing 150 g of zinc sulfate (ZnSO4) per liter?

14. A test tube contains 10 mL of a 3.0 M CaCO3 solution. Calculate the number of grams of CaCO3 in the tube.

Answers: 4. 448 g KCl 8. 0.32 M NaOH (aq) 12. 23 g C3H8O3

5. 1715 g MgCl2 9. 0.24 M Na2CO3 (aq) 13. 0.93 M ZnSO4 (aq)

6. 417 g BaCl2 10. 34 g AgNO3 14. 3.0 g CaCO3

7. 7.6 g FeSO4 11. 0.08 M KMnO4 (aq)