Name : _____ Date : _____

Molarity Problems Worksheet

1. How many grams of magnesium cyanide are needed to make 275 mL of a 0.075 M solution?

2. Find the volume of a 0.75 M solution if it contains 39 grams of potassium hydroxide.

4. What is the molarity of a solution in which 0.850 grams of ammonium nitrate are dissolved in 345 mL of solution?

5. Explain how you would make 675 mL of a 0.400 M barium iodide solution.

6. Calculate the volume of 0.250 M H_2SO_4 that contains 0.250 g H_2SO_4.

7. 1.50 g of NaCl is dissolved in 100.0 mL of water. Calculate the concentration.

8. How many moles of NaCl are in 250. mL of a 0.200 M solution?

9. How many liters of a 0.200 M KCl solution contain 0.250 moles?

10. Calculate the mass of $CuSO_4 \cdot 5H_2O$ required to prepare 100.0 mL of 0.100 M solution.

Molarity Problems Worksheet

Answers

1. How many grams of magnesium cyanide are needed to make 275 mL of a 0.075 M solution?

   275 mL H_2O x 1 g H_2O/1000 mL H_2O = 0.275 L H_2O

   275 L $Mg(CN)_2$ x 0.075 mole $Mg(CN)_2$/1 L $Mg(CN)_2$ x 76.3 g $Mg(CN)_2$/1 mole $Mg(CN)_2$
   = 1.6 g $Mg(CN)_2$

2. Find the volume of a 0.75 M solution if it contains 39 grams of potassium hydroxide.

   39 g KOH x 1 mole KOH/56 g KOH x 1 L KOH/0.75 mol KOH = 0.93 L = 930 mL

3. How many grams of hydrochloric acid are present in 3.0 L of a 0.750 M solution?

   3.0 L soln x 0.750 moles HCl/1 L soln x 36.45 g HCl/1 mole HCl = 82 g HCl

4. What is the molarity of a solution in which 0.850 grams of ammonium nitrate are dissolved in 345 mL of solution?

   0.850 g NH_4NO_3 x 1 mole NH_4NO_3/80 g NH_4NO_3 = 0.0106 mole NH_4NO_3

   0.0106 mole NH_4NO_3/0.345 L NH_4NO_3 = 0.0307 M

5. Explain how you would make 675 mL of a 0.400 M barium iodide solution.

   0.675 L BaI_2 x 0.400 moles BaI_2/1 L BaI_2 = 0.270 moles BaI_2

   0.270 moles BaI_2 x 391.1 g BaI_2/1 mole BaI_2 = 106 g BaI_2

   Measure 106 g BaI_2 into a beaker and add water to a volume of 675 mL.

6. Calculate the volume of 0.250 M H_2SO_4 that contains 0.250 g H_2SO_4.

   0.250 g H_2SO_4 x 1 mole /98.12 g x 1 L/0.250 mole = 0.0102 L

7. 1.50 g of NaCl is dissolved in 100.0 mL of water. Calculate the concentration.

   Molarity = (1.50 g x 1 mole/58.5 g)/0.1000 L = 0.256 M

8. How many moles of NaCl are in 250. mL of a 0.200 M solution?

   0.250 L x 0.200 mol/ 1L = 0.0500 mol

9. How many liters of a 0.200 M KCl solution contain 0.250 moles?

   0.250 moles x 1 L/0.200 moles = 1.25 L

10. Calculate the mass of $CuSO_4 \cdot 5H_2O$ required to prepare 100.0 mL of 0.100 M solution.

    0.100 L x 0.100 mole/1 L x 249.7 g/1 mol = 2.50 g