Practicing Molarity Worksheet

1. What mass of lithium phosphate would you use to make 2.5 liters of 1.06 M lithium phosphate solution?

2. If you evaporated 250 mL of a 3.5 M solution of iron (II) nitrite, what mass of iron (II) nitrite would you recover?

3. A curious chemist wants to determine how many atoms are in a 4.0 L solution of 3.0 M silver nitrate. Determine how he can do this.

4. To make a 4.00 M solution, how many moles of solute will be needed if 12.0 liters of solution are required?

5. How many moles of sucrose are dissolved in 250 mL of solution if the solution concentration is 0.150 M?

6. What is the molarity of a solution of HNO_3 that contains 12.6 grams of HNO_3 in 1.0 L of solution?

7. Calculate molarity by dissolving 25.0 g NaOH in 325 mL of solution.

8. Calculate grams of solute needed to prepare 225 mL of 0.400 M KBr solution.

9. Calculate mL of 0.650 M KNO_3 needed to contain 25.0 g KNO_3.

10. What is the molarity of a solution in which 58 g of NaCl are dissolved in 1.0 L of solution?

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Answers

1. What mass of lithium phosphate would you use to make 2.5 liters of 1.06 M lithium phosphate solution?

   Molarity = 2.5 L soln x 1.06 mol $Li3PO_4$/1 L soln x 115.79 g $Li3PO_4$/1 mol Li_3PO_4 = 310 g Li_3PO_4

2. If you evaporated 250 mL of a 3.5 M solution of iron (II) nitrite, what mass of iron (II) nitrite would you recover?

   Molarity = 0.250 L soln x 3.5 mol $Fe(NO_2)_2$ /1 L soln x 147.86 g $Fe(NO_2)$/1 mol $Fe(NO_2)_2$ = 130 g $Fe(NO_2)_2$

3. A curious chemist wants to determine how many atoms are in a 4.0 L solution of 3.0 M silver nitrate. Determine how he can do this.

   Molarity = 4.0 L soln x 3.0 mol $AgNO_3$/1 L soln x 6.0_2x10^{23} mole $AgNO_3$/1 mol $AgNO_3$ x 5 atoms/1 mole = 3.6 x 1025 atoms

4. To make a 4.00 M solution, how many moles of solute will be needed if 12.0 liters of solution are required?

   4.00 M = number of moles/12.0 L soln => Number of moles = 4.00 M x 12.0 L = 48 mol

5. How many moles of sucrose are dissolved in 250 mL of solution if the solution concentration is 0.150 M?

   0.150 M = Number of moles/250 x 10^{-3} L soln => Number of moles = 0.150 M x 250 x 10^{-3} L soln

6. What is the molarity of a solution of HNO_3 that contains 12.6 grams of HNO_3 in 1.0 L of solution?

   Moles of HNO_3 = 12.6 grams HNO_3 x 1 mol /63 g HNO_3 = 0.200 mol HNO_3

   Molarity = 0.200 mol HNO_3/1.0 L of soln = 0.200 M

7. Calculate molarity by dissolving 25.0 g NaOH in 325 mL of solution.

   Molarity = (25.0 g NaOH x 1 mol/40 g NaOH)/325 x 10^{-3} L soln = 1.92 M

8. Calculate grams of solute needed to prepare 225 mL of 0.400 M KBr solution.

   Moles of KBr = 0.400 M x 225 x 10^{-3} L = 0.09 mol

   Amount of KBr = 0.09 mol x 119 g/mol = 10.71 g

9. Calculate mL of 0.650 M KNO_3 needed to contain 25.0 g KNO_3.

   25.0 g x (1 mol/101 g) x (1000 mL/0.650 mol) = 381 mL

10. What is the molarity of a solution in which 58 g of NaCl are dissolved in 1.0 L of solution?

    Number of moles = 58 g NaCl x 1 mol/58 g NaCl = 1 mol

    Molarity = 1 mol/1.0 L = 1 M