**Molarity:**

**Formula:** M= **All Possible Units:** M, , molar, [#]

Ex1 4M= 4 =4 molar = = [4]

Ex2 A saline solution contains 0.90 g NaCl in exactly 100. mL of solution. What is the molarity of the solution?

Ex3 How many moles of solute are present in 1.5L of 0.24M Na2SO4?

1. Calculate the molarity of 0.060 moles NaHCO3 in 1500. mL of solution.
2. What is the molar concentration of 1.0 mol of KCl dissolved in 750. mL of solution?
3. Calculate the molarity of 29.25 grams of NaCl in 2.0 liters of solution.
4. Calculate the molarity of 34 grams of sugar, C12H22O11 in 500. mL of solution.
5. Calculate the number of moles of NaCl contained in 0**.**500L of a 1**.**5M solution.

6. How many grams of NaCl are contained in the solution discussed in problem #5 ?

7. Calculate the number of moles of NaOH contained in 250. mL of a 0.05M solution.

8. How many grams and moles of solute are there in 250. mL of a 0.10M CaCl2 solution?

Ans 1) 0.040M 2) 1.3M 3)0.25M 4)0.20M 5) 0.75M 6) 44 g 7) 0.01 mole 8) 2.8 g

**Molarity by Dilution: Formula:** M1V1 = M2V2 or Minitial Vinitial  = MfinalVfinal

How many milliliters of a stock solution of 2.00M MgSO4 would you need to prepare 100.0 mL of 0.400M MgSO4?

1. If 125 mL of a 0.15M NaOH solution is diluted to a final volume of 150 mL, what will the molarity of the diluted solution be?
2. If 100. mL of a 0.15 M NaOH solution is diluted to a final volume of 175 mL, what will the molarity of the diluted solution be?
3. How many liters of a 0.050 M HCl solution can be made by diluting 250 mL of 10.M HCl?
4. 345 mL of a 1.5 M NaCl solution is boiled until the volume of the solution is 250. mL, what is the new molarity of the solution ?
5. How many liters will be made when 500 mL of a 2.4M KCl solution is diluted to a 1.0 M solution?

Ans 1) 0.13M 2) 0.086M 3)5.0 x 104M 4) 2.1M 5) 1000 mL

**Extra Credit:** Na(s) +2 H2O (l) 🡺 2NaOH (aq) + H2 (g) Suppose that 10.0 g of sodium reacts completely with 1.00 L of water and the final solution volume is 1.00L. What is the molarity of the NaOH solution formed by this reaction?