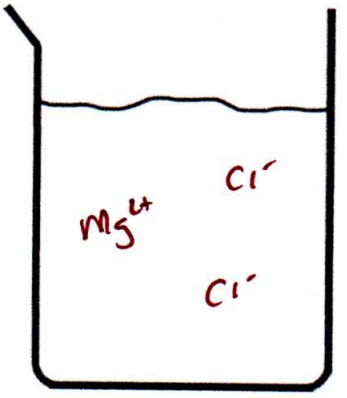
(#4-2c)
MOLARITY

A9

$$M = \frac{n}{-}$$



1. 5.0 Moles $MgCl_2$ in 5.0 liters; what is the molarity of the Solution?
   a. Write a formula and draw a picture $MgCl_2$ dissolving. $MgCl_2 \rightarrow Mg^{2+} + 2Cl^-$
   b. Determine molarity of $MgCl_2$. 5 mol / 5 L = 1.0 M
   c. Molarity of Mg^{2+} ions 1.0 M
   d. Molarity of Cl^{-1} ions ×2 2.0 M
   e. Molarity of ions ×3 3.0 M
2. 5.0 moles of $LiNO_3$ dissolved in 2.0 liters what is the final molarity of the solution? 5.0/2.0 = 2.5 M
3. How many moles of CO_2 must be added to ½ liter to create a 2M solution. $2M = \frac{x}{.5L}$ $x = 1$ mol
4. 5.0 moles of Ca and you want to make a 3.2 molar solution. How many liters of water H_2O do you need? $3.2 = \frac{5.0}{x}$ = $x = 1.56$ L (1.6 L)
5. Need 1.5M solution of NaCl with a volume of 500.0mL. How much NaCl would you need to weigh out? $1.5M = \frac{x}{.5L}$ $x = 0.75 \text{ mol} \cdot \frac{58 g}{1 mol} = 43.5 g$
6. Need a 2.5 M solution of $Ca(NO_3)_2$ which is 2.0L in volume. What is the moles and mass needed for this solution? $2.5M = \frac{x}{2L}$ $x = 5.0 \text{ mol} \cdot \frac{164 g}{1 mol} = 820 g$
7. In a 250. mL solution of 1.5 M $NaOH_{(aq)}$ how many moles of NaOH are present? $1.5M = \frac{x}{0.250L}$ $x = 0.375$ mol
8. 2.0 molar solution of H_2SO_4. If you have 10. moles in your solution what is the volume? $2M = \frac{10}{x}$ $x = 5L$
9. 1.5 M solution of HCl. In this solution you have 15. grams of HCl what is the volume? $1.5M = \frac{0.41}{x}$ $x = 0.27L$ $15g \cdot \frac{1 mol}{36.5 g} = .41$
10. You have 25 grams of a chemical known as Crystal violet. The molecular weight is 407.0 grams/mol. Your lab calls for 2.5L of 0.005M solution. Do you have enough CV? How much solution can actually be made. $25g \cdot \frac{1 mol}{407 g} = 0.061$ mol → yes
    $0.005 = \frac{0.061}{x}$ $x = 12.2L$