

5/10/18

Molarity & Molality Hmwks:

$$1. M = \frac{n}{L} \quad 145\text{g NaCl} \times \frac{1\text{ mol}}{58.54\text{g}} = 2.48\text{ mol} \quad \frac{2.48\text{ mol}}{2.75\text{ L}} = \boxed{0.902\text{ M}}$$

$$3. M = \frac{n}{L} \quad 85.6\text{g HCl} \times \frac{1\text{ mol}}{36.46\text{g}} = 2.348\text{ mol} \quad \frac{2.348\text{ mol}}{0.385\text{ L}} = \boxed{6.10\text{ M}}$$

$$5. M = \frac{n}{L} \quad 8.77\text{g KI} \times \frac{1\text{ mol}}{166.00\text{g}} = 0.05283\text{ mol} \quad \frac{0.05283\text{ mol}}{4.75\text{ L}} = \boxed{0.0111\text{ M}}$$

$$9. 75.2\text{g AgClO}_4 \times \frac{1\text{ mol}}{207.35\text{g}} = 0.3627\text{ mol} \quad \frac{0.3627\text{ mol}}{0.885\text{ kg}} = \boxed{0.410\text{ m}}$$

$$11. 2.68\text{g Hg(CN)}_2 \times \frac{1\text{ mol}}{252.64\text{g}} = 0.0106\text{ mol} \quad \frac{0.0106\text{ mol}}{0.0186\text{ kg}} = \boxed{0.570\text{ m}}$$

$$13. 8.1\text{g K}_2\text{S} \times \frac{1\text{ mol}}{110.27\text{g}} = 0.07355\text{ mol} \quad \frac{0.07355\text{ mol}}{0.0476\text{ kg}} = \boxed{1.55\text{ m}}$$

Solutions Cont'd

Colloid: a mixture in which the parts will not stay in solution without constant stirring. (not a true solution)
also called an emulsion.

Colligative properties - changes in the behavior of the solvent due to the addition of the solute.

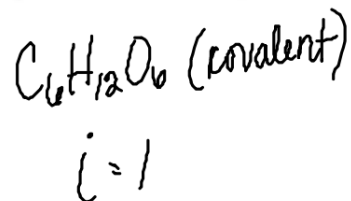
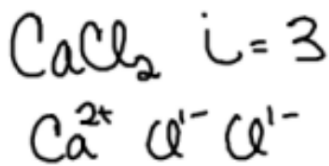
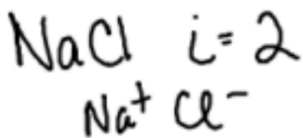
Freezing point depression - reduction in freezing point due to the addition of solute.

Boiling point elevation - increase in boiling point due to the addition of solute.

Formula $\Delta T = i \cdot \frac{K_b}{K_f} \cdot m$ where $i = \#$ of particles
(Colligative Prop) $K_b =$ boiling constant \rightarrow given to you!
 $K_f =$ freezing constant
 $m =$ molality

To calculate "i" nonpolar molecule $i = 1$

polar molecule = determine # of ions that are present. (dissociation)



$M_1 V_1 = M_2 V_2$
 ↑ ↑ ↑
 M of stock soln. M of soln. for lab. volume needed for lab.

← used to calculate quantities for dilutions

Practice:

If the store room has 24M HCl , how many milliliters will be needed to make 2.00L of 3.0M HCl ?

$$\underbrace{(24\text{M})}_{M_1} (\underbrace{V_1}_{V_1}) = \underbrace{(3.0\text{M})}_{M_2} (\underbrace{2.00\text{L}}_{V_2}) = 250\text{ ml of } 24\text{M HCl}$$

Add Acid
 To make a dilution

