5/10/18

Molarity & Molality Hmwk:

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

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

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

9. $75.2\text{g } AgClO_4 \times \frac{1\text{ mol}}{207.35\text{g}} = 0.3627\text{ mol}$ $\frac{0.3627\text{ mol}}{0.885\text{ kg}} = \boxed{0.410\text{ m}}$

11. $2.68\text{g } Hg(CN)_2 \times \frac{1\text{ mol}}{252.64\text{g}} = 0.01061\text{ mol}$ $\frac{0.01061\text{ mol}}{0.0186\text{ kg}} = \boxed{0.570\text{ m}}$

13. $8.1\text{g } K_2S \times \frac{1\text{ mol}}{110.27\text{g}} = 0.07355\text{ mol}$ $\frac{0.07355\text{ mol}}{0.0476\text{ kg}} = \boxed{1.55\text{ m}}$

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 $\Delta T = i \cdot K_b \cdot m$ (Colligative Prop) where i = # of particles

K_b = boiling constant
K_f = freezing constant
} given to you!

m = molality

To calculate "i"

nonpolar molecule $i = 1$

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

NaCl $i = 2$
Na^+ Cl^-

$CaCl_2$ $i = 3$
Ca^{2+} Cl^- Cl^-

$C_6H_{12}O_6$ (covalent)
$i = 1$

$M_1V_1 = M_2V_2$ ← used to calculate quantities for dilutions

M_1 of stock soln. | M_2 of soln. for lab. | V_2 volume needed for lab.

Practice:

If the storeroom has 24M HCl, how many milliliters (V_1) will be needed to make 2.00 L (V_2) of 3.0M HCl (M_2)?

$$\frac{(24M)(V_1) = (3.0M)(2.00L)}{24M} = \frac{(3.0M)(2000ml)}{24M} = 250\ ml \text{ of } 24M\ HCl$$