Unit #9 Practice Blackboard Insert

1. **(2 pts.)** What is the percent by mass of a solution which is made by dissolving 43.25 g of $Mg(NO_3)_2$ in 435.0 g of water?

Solute = Magnesium Nitrate
Solvent = Water
Solution = Sum of Solute + Solvent

$$\frac{43.25\ g}{(43.25 + 435.0)g} \times 100 = 9.043\ \%$$

2. **(2 pts.)** How many moles of NH_4NO_3 are present in 336.0 mL of a 0.834 M NH_4NO_3 solution?

$$\frac{0.834\ \text{moles}}{1000\ \text{mL}} \times 336.0\ \text{mL} = 0.280\ \text{moles}$$

3. **(2 pts.)** How many grams of K_2SO_4 would be needed to prepare 715.0 g of a 3.65 % by mass solution of K_2SO_4?

$$0.0365 = \frac{\text{Solute}}{715.0\ g}$$

Solute = 26.1 g

4. **(4 pts.)** Given the following reaction:
Calcium Nitrate plus Potassium Carbonate Yields Calcium Carbonate and Potassium Nitrate:

$$Ca(NO_3)_{2\,(aq)} + K_2CO_{3\,(aq)} \rightarrow CaCO_{3\,(s)} + 2\,KNO_{3(aq)}$$

How many mL of 0.405 M $Ca(NO_3)_2$ solution are needed to completely react with 33.50 mL of 0.677 M K_2CO_3 solution?

$$\frac{0.677\ \text{moles}\ K_2CO_3}{1000\ \text{mL}} \times 33.50\ \text{mL} \times \frac{1\ \text{mole}\ Ca(NO_3)_2}{1\ \text{mole}\ K_2CO_3} \times \frac{1000\ \text{mL}}{0.405\ \text{moles}\ Ca(NO_3)_2} = 56.0\ \text{mL}$$

Extra Credit (1 pt):

Convert name to formula or visa versa … from the list of names in unit 5