Solutions Review

- Net Ionic Equations
- Properties of Solutions
  - Solute/solvent, factors affecting rate of dissolving
- Solubility
- Concentration
- Dilutions

For the following double replacement reaction, write a complete ionic equation, a net ionic equation, and identify all spectator ions present.

$Na^+ OH^-$ $Ca^{2+} NO_3^-$

$$2NaOH_{(aq)} + Ca(NO_3)_{2(aq)} \longrightarrow 2NaNO_{3(aq)} + Ca(OH)_{2(s)}$$

$$2Na^+_{(aq)} + 2OH^-_{(aq)} + Ca^{2+}_{(aq)} + 2NO_{3(aq)}^- \longrightarrow 2Na^+_{(aq)} + 2NO_{3(aq)}^- + Ca(OH)_{2(s)}$$

Spectator: $Na^+_{(aq)}$, $NO_{3(aq)}^-$

Net Ionic: $2OH^-_{(aq)} + Ca^{2+}_{(aq)} \rightarrow Ca(OH)_{2(s)}$

Determine the concentration of a solution in which 1.89 mol of KCl is dissolved in 2.70 L of water.

$C = ?$

$n = 1.89\ mol$

$V = 2.70\ L$

KCl

$$C = \frac{n}{V}$$

$$C = \frac{1.89\ mol}{2.70\ L}$$

$$C = 0.700\ mol/L$$

Determine the mass in 1.50L of a 0.80M $NaNO_3$ solution.

0.80 mol/L

$m = ?$

$V = 1.50\ L$

$C = 0.80\ M$

$NaNO_3$

$$C = \frac{n}{V}$$

$$0.80\ mol/L = \frac{n}{1.50\ L}$$

$$n = (0.80\ mol/L)(1.50\ L)$$

$$n = 1.20\ mol$$

$$1.20\ mol\ NaNO_3 \times \frac{85.00\ g\ NaNO_3}{1\ mol\ NaNO_3} = \boxed{102\ g\ NaNO_3}$$

Calculate the final concentraion of a solution in which 240. mL of water is added to 80.0 mL of a 2.24 mol/L solution.

$V_i = 80.0\,mL$

$C_i = 2.24\,mol/L$

$V_F = 320.\,mL$

$C_F = ?$

$$V_i C_i = V_F C_F$$

$$(80.0\,mL)(2.24\,mol/L) = (320.\,mL)C_F$$

$$C_F = \frac{(80.0\,mL)(2.24\,mol/L)}{(320.\,mL)}$$

$$C_F = 0.560\,mol/L$$