C11 - 4.3 - Dissocia/olu/tion/Precipitate/Titration Notes

Dissociation: General process in which molecules, or ionic compounds, separate or split into other things such as atoms, ions, usually in a reversible manner.

Precipitate
$$Pb_{(ag)}^{+2} + 2Cl_{ag}^{-} \rightarrow PbCl_{2(s)}$$

Crystallization: Transforming a solution into a solid crystalline structure (constituents organized into a highly ordered structure).

$$Pb_{(aq)}^{+2} + 2Cl_{aq}^{-} \rightarrow PbCl_{2(s)}$$

Precipitation: In aqueous solution, the process of transforming a dissolved substance into an insoluble, amorphous (noncrystalline) solid (the precipitate) from a super-saturated-solution. (Find the net-ionic equation)

Dissolution: Dissolving process of the solid solute.

$$NaCl_{(s)} + H_2O_{(l)} \rightarrow Na^+_{(aq)} + Cl^-_{(aq)} + H_2O_{(l)}$$

 $C_6H_{12}O_{6(s)} + H_2O_{(l)} \rightarrow C_6H_{12}O_{6(aq)}$

Titration: Slow addition solution of known concentration (titrant) to known volume of another solution of unknown concentration (titrand) until an equivalence point (ratio of moles equals ratio of coefficients in balanced chemical reaction), which is often indicated by a color change. (to determine the unknown concentration.) (Don't have to find limiting reagent.)

What volume of 0.0220 M nitric acid is required to neutralize 75mL of 0.0340M potassium hydroxide?

$$\begin{array}{c} HNO_3 + K(OH) \rightarrow KNO_3 + H_2O \\ n = 0.0340 \times 0.075 \\ n = 0.00255 \end{array} \\ 0.00255 \ mol \ K(OH) \times \frac{1 \ mol \ HNO_3}{1 \ mol \ K(OH)} = \underbrace{0.00255 \ mol \ HNO_3}_{V = 0.1159 \ L}$$

Find the [LiOH] of a 25.0 mL sample of lithium hydroxide was titrated against 32.9 mL of 0.648 M sulphuric acid.

$$n = 0.648 \times 0.0329$$

$$n = 0.0213$$

$$0.0213 \ mol \ H_2SO_4 \times \frac{2 \ mol \ LiOH}{1 \ mol \ H_2SO_4} = 0.0426 \ mol \ LiOH$$

$$c = \frac{0.0426}{0.025}$$

$$[LiOH] = 1.8$$

Neutralization

 $Acid + Base \rightarrow Salt + Water$