

Acidity & Alkalinity problems

Equivalent point

- **Definition:** it's the point at which the number of grams equivalent of standard solution = number of grams equivalent of the solution with unknown concentration **(at which $[H^+] = [OH^-]$)**,
- $(N*V)_{acid} = (N*V)_{base}$
- $N \rightarrow$ (Normality), $V \rightarrow$ (Volume)

- **Example (1):**

- A 7 mL of standard solution (HCl) with a normality (0.15N) was titrated against 10 mL of Sodium hydroxide (NaOH). What is the Normality of sodium hydroxide solution?

Solution:

- $(N \cdot V)_{\text{acid}} = (N \cdot V)_{\text{base}}$
- $N_{\text{base}} = (N \cdot V)_{\text{acid}} / V_{\text{base}}$
- Normality = $(0.15 \cdot 7) / 10$
- Normality of NaOH = $0.105 \text{ g}_{\text{equiv.}}/\text{l}$

- **Example (2):**

- A 15 mL of standard solution (NaOH) with a normality (0.3N) was titrated against 10 mL of sulfuric acid (H_2SO_4). What is the Normality of sulfuric acid solution?

Solution:

- $(N \cdot V)_{\text{acid}} = (N \cdot V)_{\text{base}}$
- $N_{\text{acid}} = (N \cdot V)_{\text{base}} / V_{\text{acid}}$
- Normality = $(0.3 \cdot 15) / 10$
- Normality of $\text{H}_2\text{SO}_4 = 0.45 \text{ g}_{\text{equiv.}}/\text{l}$

Home work

- A 30 mL of standard solution (NaOH) with a normality (0.5N) was titrated against 20 mL of sulfuric acid (H_2SO_4). What is the Normality of sulfuric acid solution?