Preparation & Standardization of 0.1 N HCl Solution

Assist. Lec. Marwa Hashim

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- Objective:
- - Prepare diluted HCl from concentrated acid
- - Standardize it using Na_2CO_3

Preparation of 0.1 N HCl

- Given commercial HCl:
- - Molecular Weight = 36.5 g/mol
- - Sp.Gr = 1.18 g/mL
- - Purity = 37%

- Normality of concentrated HCl:
- $N = (Sp.Gr \times Purity \times 1000) / Eq.Wt$
- $N = (1.18 \times 0.37 \times 1000) / 36.5 \approx 12\ N$

- Dilution to 0.1 N (for 1 L):
- $V_1 = (0.1 \times 1000) / 12 \approx 8.3\ mL$

Preparation of 0.1 N Na_2CO_3

- Equivalent Weight = 53 g/equiv

- For 0.1 N in 500 mL:
- Mass = N × Eq.Wt × Volume
- Mass = 0.1 × 53 × 0.5 = 2.65 g

Standardization Procedure

- 1. Fill burette with prepared HCl
- 2. Pipette 10 mL of 0.1 N Na_2CO_3
- 3. Add 2 drops methyl orange
- 4. Titrate until orange → faint pink

Final Calculation

- $N_1 \times V_1 = N_2 \times V_2$

- Example:
- If V_1 = 9.8 mL:
- $N_1 = (0.1 \times 10) / 9.8 = 0.102$ N