

Post Lab Questions

1. What mass of oxalic acid dihydrate, $\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$, is needed to prepare 250.0 mL of 0.050 M solution?

$$[\text{H}_2\text{C}_2\text{O}_4] = \frac{n_{\text{H}_2\text{C}_2\text{O}_4}}{V} = \frac{m_{\text{H}_2\text{C}_2\text{O}_4}}{M_{\text{H}_2\text{C}_2\text{O}_4} \times V}$$

$$m_{\text{H}_2\text{C}_2\text{O}_4} = [\text{H}_2\text{C}_2\text{O}_4] \times M_{\text{H}_2\text{C}_2\text{O}_4} \times V$$

$$m_{\text{H}_2\text{C}_2\text{O}_4} = 1.575 \text{ g}$$

2. If 0.750 grams of oxalic acid dihydrate required 31.0 mL of NaOH solution in a titration, what was the concentration of the base?

At the equilibrium:

$$\frac{n_{\text{NaOH}}}{2} = n_{\text{H}_2\text{C}_2\text{O}_4}$$

$$m_{\text{NaOH}} = \frac{2 \times m_{\text{H}_2\text{C}_2\text{O}_4} \times M_{\text{NaOH}}}{M_{\text{H}_2\text{C}_2\text{O}_4}} = 0.476 \text{ g}$$

$$m_{\text{NaOH}} = 0.476 \text{ g}$$

3. What was the equivalent weight of an acid if 0.250 grams of it just neutralized 41.0 mL of 0.161 M NaOH solution?

$$n_{\text{NaOH}} = [\text{NaOH}] \times V_{\text{NaOH}} = 41 \times 10^{-3} \text{ L} \times 0.161 \text{ mol/L}$$

$$n_{\text{NaOH}} = 0.0066 \text{ moles}$$

At the equivalence: $n_{\text{acid}} = n_{\text{base}} = 0.0066 \text{ moles}$

$$n_{\text{acid}} = \frac{m_{\text{acid}}}{M_{\text{acid}}} \Rightarrow M_{\text{acid}} = \frac{m_{\text{acid}}}{n_{\text{acid}}} = \frac{0.25 \text{ g}}{0.0066 \text{ mol}}$$

$$M_{\text{acid}} = 37.87 \text{ g/mol}$$