

$$V = 100.0 \text{ mL}$$

$$= 0.1 \text{ L}$$

$$c = 1.50 \frac{\text{mol}}{\text{L}}$$

$$m = ?$$

$$M = 39.997 \frac{\text{g}}{\text{mol}}$$

Line:

$$m_{\text{NaOH}} = 0.1 \text{ L} \cancel{\text{H}_2\text{SO}_4} \times \frac{1.50 \text{ mol} \cancel{\text{H}_2\text{SO}_4}}{\text{L} \cancel{\text{H}_2\text{SO}_4}} \times \frac{2 \text{ mol} \text{NaOH}}{1 \text{ mol} \cancel{\text{H}_2\text{SO}_4}} \times \frac{39.997 \text{ g} \text{NaOH}}{1 \text{ mol} \cancel{\text{NaOH}}} = 12.0 \text{ g}$$

OR

$$n_{\text{H}_2\text{SO}_4} = 0.1 \text{ L} \times 1.50 \frac{\text{mol}}{\text{L}} = 0.15 \text{ mol}$$

$$n_{\text{NaOH}} = 0.150 \text{ mol} \text{H}_2\text{SO}_4 \times \frac{2 \text{ mol} \text{NaOH}}{1 \text{ mol} \text{H}_2\text{SO}_4} = 0.3 \text{ mol}$$

$$m_{\text{NaOH}} = 0.3 \text{ mol} \times \frac{39.997 \text{ g}}{\text{mol}} = 12.0 \text{ g}$$



$$V = 100 \text{ mL}$$

$$= 0.1 \text{ L}$$

$$c = 1.5 \frac{\text{mol}}{\text{L}}$$

$$V = 50 \text{ mL}$$

$$= 0.05 \text{ L}$$

$$c = ?$$

$$c_{\text{Al}(\text{OH})_3} = 0.1 \cancel{\text{H}_2\text{SO}_4} \times \frac{1.5 \text{ mol} \cancel{\text{H}_2\text{SO}_4}}{\cancel{\text{L}} \text{H}_2\text{SO}_4} \times \frac{2 \text{ mol} \text{Al}(\text{OH})_3}{3 \text{ mol} \cancel{\text{H}_2\text{SO}_4}} \times \frac{1}{0.05 \text{ L} \text{Al}(\text{OH})_3} = 2.0 \frac{\text{mol}}{\text{L}}$$



$$m = 1560 \text{ g} \quad V = 5.67 \text{ L}$$

$$M = 56.105 \frac{\text{g}}{\text{mol}} \quad c = ?$$

$$c_{\text{H}_2\text{SO}_4} = 1560 \cancel{\text{g KOH}} \times \frac{1 \text{ mol KOH}}{56.105 \cancel{\text{g KOH}}} \times \frac{1 \text{ mol H}_2\text{SO}_4}{2 \cancel{\text{mol KOH}}} \times \frac{1}{5.67 \text{ L}}$$

$$= 2.45 \frac{\text{mol}}{\text{L}} \quad \therefore \text{the concentration of sulfuric acid is } 2.45 \text{ M}$$



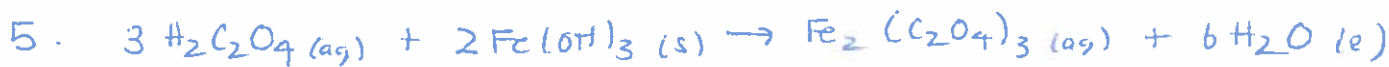
$$m = ? \quad c = 2.90 \frac{\text{mol}}{\text{L}}$$

$$M = 60.052 \frac{\text{g}}{\text{mol}} \quad V = 0.3 \text{ L}$$

$$m_{\text{HC}_2\text{H}_3\text{O}_2} = 0.3 \text{ L} \cancel{\text{NaOH}} \times \frac{2.90 \text{ mol NaOH}}{\cancel{\text{L NaOH}}} \times \frac{1 \text{ mol HC}_2\text{H}_3\text{O}_2}{1 \cancel{\text{mol NaOH}}} \times \frac{60.052 \text{ g HC}_2\text{H}_3\text{O}_2}{1 \cancel{\text{mol HC}_2\text{H}_3\text{O}_2}}$$

$$= 52.2 \text{ g}$$

\therefore the mass of acetic acid is 52.2 g



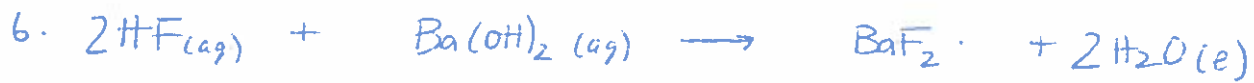
$$c = 4.70 \frac{\text{mol}}{\text{L}} \quad m = ?$$

$$V = 2.20 \text{ L} \quad M = 106.866 \frac{\text{g}}{\text{mol}}$$

$$m_{\text{Fe}(\text{OH})_3} = 2.20 \text{ L} \cancel{\text{H}_2\text{C}_2\text{O}_4} \times \frac{4.70 \text{ mol H}_2\text{C}_2\text{O}_4}{\cancel{1 \text{ L H}_2\text{C}_2\text{O}_4}} \times \frac{2 \text{ mol Fe}(\text{OH})_3}{3 \cancel{\text{mol H}_2\text{C}_2\text{O}_4}} \times \frac{106.866 \text{ g Fe}(\text{OH})_3}{\cancel{1 \text{ mol Fe}(\text{OH})_3}}$$

$$= 737 \text{ g}$$

\therefore the mass of $\text{Fe}(\text{OH})_3$ is 737 g



$$m = ?$$

$$c = 2.0 \frac{\text{mol}}{\text{L}}$$

$$M = 20.006 \frac{\text{g}}{\text{mol}}$$

$$V = 1.7 \text{ L}$$

$$m_{\text{HF}} = 1.7 \text{ L Ba}(\text{OH})_2 \times \frac{2.0 \text{ mol Ba}(\text{OH})_2}{1 \text{ L Ba}(\text{OH})_2} \times \frac{2 \text{ mol HF}}{1 \text{ mol Ba}(\text{OH})_2} \times \frac{20.006 \text{ g HF}}{\text{mol HF}}$$

$$= 136 \text{ g}$$

$$= 140 \text{ g (with sf)}$$

\therefore 140g of HF is required.

