

3

Now you try! Choose your favorite method. ☺



3. In a titration, what volume of 4.65 M NH₃ is needed to neutralize 90.7 mL of 1.80 M HC₂H₃O₂?

$$M_a V_a = M_b V_b$$

$$(1.80 M)(90.7 \text{ mL}) = (4.65 M) V_b$$

$$V_b = \frac{(1.80)(90.7)}{4.65} = \boxed{35.1 \text{ mL}}$$

4. If 29.9 mL of a solution of RbOH requires 16.1 mL of a 2.3 M solution of HClO₄ for complete titration, what is the initial molarity of the RbOH solution?

$$M_a V_a = M_b V_b$$

$$(2.3 M)(16.1 \text{ mL}) = M_b (29.9 \text{ mL})$$

$$M_b = \frac{(2.3)(16.1)}{29.9} = \boxed{1.2 \text{ M RbOH}}$$

Multiple Choice Practice

1. 0.60 M HNO₃ was used to neutralize 15 mL of 0.30 M KOH. What volume of HNO₃ was needed?

- (a) 7.5 mL b. 15.0 mL c. 22.5 mL d. 30.0 mL

$$M_a V_a = M_b V_b$$

$$(0.6) V_a = (0.3)(15)$$

$$V_a = \frac{0.3 \times 15}{0.6} = \frac{15}{2} = 7.5 \text{ mL}$$

2. The complete neutralization of 15.0 mL of KOH requires 0.030 mol HNO₂. The [KOH] was:

- a. 0.0020 M b. 0.50 M (c) 2.0 M d. 5.0 M

$$\text{moles HNO}_2 = \text{moles KOH}$$

$$0.030 \text{ mol} = M_b (0.0150 \text{ L}) \Rightarrow M_b = \frac{0.030}{0.0150} = 2$$

3. During a titration, what volume of 1.00 M KOH is necessary to completely neutralize 10.0 mL of 2.00 M HC₂H₃O₂?

- a. 10.0 mL (b) 20.0 mL c. 25.0 mL d. 40.0 mL

$$M_a V_a = M_b V_b$$

$$(2.00 M)(10.0 \text{ mL}) = (1.00 M) V_b$$

$$V_b = 2 \times 10 = 20 \text{ mL}$$