Answer on Question #50450, Chemistry, Other

Task:

A titration of 15.0 cm^3 of household ammonia, NH_3, required 38.70 cm^3 of 8.0 M HCl. Calculate the molarity of the ammonia.

What volume of 5.0 M HNO_3 is required to neutralize 25.00 cm^3 of a 2.0 M NaOH solution.

Answer:

$$NH_4OH + HCl = NH_4Cl + H_2O$$

$$C_M = \frac{\nu}{V} \qquad \nu = C_M \cdot V$$

$$\nu(NH_4OH) = \nu(HCl)$$

1) $$C_M(NH_4OH) \cdot V(NH_4OH) = C_M(HCl) \cdot V(HCl)$$

$$C_M(NH_4OH) = \frac{C_M(HCl) \cdot V(HCl)}{V(NH_4OH)}$$

$$C_M(NH_4OH) = \frac{8 \cdot 0.0387}{0.015} = 20.64\,M$$

$$HNO_3 + NaOH = NaNO_3 + H_2O$$

$$C_M = \frac{\nu}{V} \qquad \nu = C_M \cdot V$$

$$\nu(HNO_3) = \nu(NaOH)$$

2) $$C_M(HNO_3) \cdot V(HNO_3) = C_M(NaOH) \cdot V(NaOH)$$

$$V(HNO_3) = \frac{C_M(NaOH) \cdot V(NaOH)}{C_M(HNO_3)}$$

$$V(HNO_3) = \frac{2 \cdot 0.025}{5} = 0.01l = 10\,cm^3$$