

Answer on Question #57525 – Chemistry – General Chemistry

Question:

Three 10mL samples of NH_4OH are titrated with 0.25mol/L sulphuric acid (data shown below). Find the average concentration of NH_4OH .

Trial 1 Initial Reading 0 mL

Trial 1 Final Reading 8.46 mL

Trial 2 Initial Reading 8.5 mL

Trial 2 Final Reading 17.0 mL

Trial 3 Initial Reading 17.0 mL

Trial 3 Final Reading 25.66 mL

Solution:

Volumes of sulphuric acid are:

$$V_1 = 8.46 \text{ ml}$$

$$V_2 = 17 - 8.5 = 8.5 \text{ ml}$$

$$V_3 = 25.66 - 17 = 8.66 \text{ ml}$$

Average volume is:

$$V = \frac{8.46 + 8.5 + 8.66}{3} = 8.54$$

According to the Equivalent Law:

$$C(\text{NH}_4\text{OH}) * V(\text{NH}_4\text{OH}) = V(\text{H}_2\text{SO}_4) * C(\text{H}_2\text{SO}_4)$$

Where C is normality of solution.

$$C(\text{NH}_4\text{OH}) = \frac{V(\text{H}_2\text{SO}_4) * C(\text{H}_2\text{SO}_4)}{V(\text{NH}_4\text{OH})} = \frac{0.25 * 8.54}{10} = 0.2135 \text{ mol/l}$$