

Answer on Question #62458 - Chemistry | General Chemistry

A student used 0.750g of potassium hydrogen phthalate dissolved in 50.0 mL of water as a primary standard (MW 204.23 g/mol). 36.01 mL of sodium hydroxide aqueous solution were required to titrate the sample. What is the molarity of the sodium hydroxide solution?

Solution

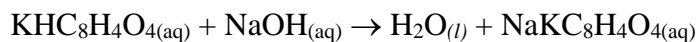
$$m(\text{KHP}) = 0.750 \text{ (g)}$$

$$M(\text{KHP}) = 204.23 \text{ (g/mol)}$$

$$n(\text{KHP}) = \frac{m}{M} = \frac{0.750 \text{ g}}{204.23 \text{ g/mol}} = 0.00367 \text{ (mol)}$$

$$C(\text{KHP}) = \frac{n}{V} = \frac{0.00367 \text{ mol}}{0.050 \text{ L}} = 0.0734 \text{ (mol/L)}$$

Since potassium hydrogen phthalate and NaOH react 1:1, the moles of NaOH required for neutralization of the potassium hydrogen phthalate is 0.0734 (mol/L).



$$C_{\text{NaOH}} = \frac{0.00367 \text{ mol}}{0.03601 \text{ L}} = 0.1019 \left(\frac{\text{mol}}{\text{L}} \right) \approx 0.1 \text{ M}$$

Answer

Molarity of the sodium hydroxide solution is 0.1 M.