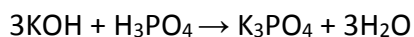


Answer on Question #81560, Chemistry, General Chemistry

A student titrates 25.00 mL of a 0.1425 M solution of phosphoric acid with a 0.3150 M standard solution of potassium hydroxide. What volume (in mL) of potassium hydroxide is needed to completely neutralize the acid?

Solution:

According to neutralization reaction:



At the equivalent point the number of moles of KOH equal number of moles of acid:

$$n(\text{KOH}) = n(\text{H}_3\text{PO}_4)$$

or:

$$C(\text{KOH}) \cdot V(\text{KOH}) = C(\text{H}_3\text{PO}_4) \cdot V(\text{H}_3\text{PO}_4)$$

Determine the volume of potassium hydroxide:

$$V(\text{KOH}) = C(\text{H}_3\text{PO}_4) \cdot V(\text{H}_3\text{PO}_4) / C(\text{KOH})$$

Using the given data:

$$V(\text{KOH}) = 0.1425 \cdot 25.00 / 0.3150 = 11.51 \text{ (ml)}$$

So the volume of potassium hydroxide is needed to completely neutralize the acid equals 11.51 ml.

Answer: $V(\text{KOH}) = 11.51 \text{ ml}$.