

Question #63556, Chemistry / Organic Chemistry

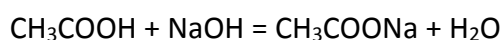
Suppose our unknown acid was acetic acid, CH_3COOH ($K_a = 1.8 \times 10^{-5}$) and that your initial aqueous solution contained 0.100 mol of acetic acid in total volume of 100 mL.

To this acetic acid solution you begin adding a 1.0 mol/L NaOH solution. Let's see what happens after adding different amounts of NaOH.

Suppose you have added a total of 23.0 mL of NaOH solution since the beginning of the titration. How many mol of acetate ions (CH_3COO^-) are present in the reaction mixture at this point? Do not include units in your answer.

Solution:

Reaction occurs



According to chemical equation:

$$\begin{aligned}n(\text{CH}_3\text{COO}^-) &= n(\text{CH}_3\text{COONa}) = n(\text{NaOH})_{\text{added}} \\n(\text{NaOH})_{\text{added}} &= c(\text{NaOH}) \times V(\text{NaOH}) = 1.0 \times 0.023 \text{ L} = 0.023 \text{ mol} \\n(\text{CH}_3\text{COO}^-) &= \mathbf{0.023 \text{ mol}}\end{aligned}$$

Answer:

0.023

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