Answer on Question #66184, Chemistry | General Chemistry

Your standardisation of the NaOH concentration gave a [NaOH] of 0.0147 M.
The average titre of NaOH with acetic acid for your experiment was 12.35 mL.
Final calculations:
2) Calculate the concentration of acetic acid in your dressing using n=cv and then c1v1=c2v2
(10.0 mL of dressing was diluted to 100 mL)?

Solution

C_1(NaOH)= 0.0147 M
V_1(NaOH)= 12.35 ml
V_1'(CH_3OOH)= 10.0 ml
V_2(CH_3OOH)= 100 ml

$$C_1 \cdot V_1 = C_2 \cdot V_2$$

$$C_2 = \frac{C_1 \cdot V_1}{V_2} = \frac{0.0147\ M \cdot 12.35\ ml}{100\ ml} = 0.00181\ M, \rightarrow \text{after dilution}$$

Before dilution: C_1(CH_3OOH)= $\dfrac{C_2 \cdot V_2}{V_1'} = \dfrac{0.00181\ M \cdot 100\ ml}{10\ ml} = 0.0181$ M

Or you can use a different calculation option:

$$n = C \cdot V = 0.0147\ M \cdot 12.35\ M = 0.1815\ mol$$

$$C(CH_3OOH) = \frac{n \cdot V(\text{Aliquot})}{V(\text{Final volume after dilution})} = \frac{0.1815 \cdot 10.0\ ml}{100\ ml} = 0.0181\ M$$

Answer

The concentration of acetic acid in the dressing must be diluted to 0.0181 M.