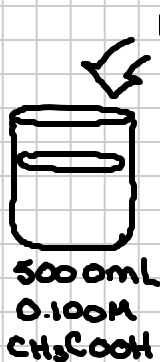


Titration of a weak acid with a strong base:

Note Title

3/7/2010

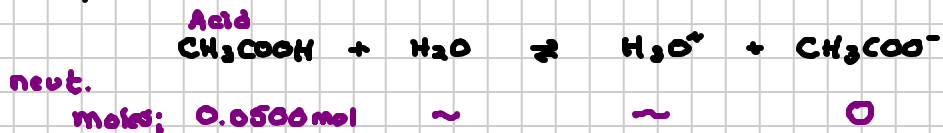


1.00 M NaOH Determine the pH of solution after 20.0 mL of NaOH has been added.

$$\text{NaOH } 0.0200 \text{ L} \times 1.00 = 0.0200 \text{ moles NaOH}$$

$$\text{CH}_3\text{COOH: } 0.500 \text{ L} \times 0.100 \text{ M} = \underline{0.0500} \text{ mole CH}_3\text{COOH}$$

$$V_T = 0.520 \text{ L}$$



shift - 0.0200 mol + 0.0200 mol

moles: 0.0300 mol 0.0200 mol

Eqil

$$i \quad \frac{0.0300 \text{ mol}}{0.520 \text{ L}} = 0.05769 \text{ M} \quad \Rightarrow \quad \frac{0.0200 \text{ mol}}{0.520 \text{ L}} = 0.03846 \text{ M}$$

C	-x	→	+x	+x
E	0.05769 - x		x	0.03846 + x

$$K_a = 1.8 \times 10^{-5} = \frac{x(0.03846+x)}{(0.05769-x)} \quad || \quad x = 2.70 \times 10^{-5} \text{ (0.070\%)} \quad \ominus$$

$$x = [\text{H}_3\text{O}^+] = 2.70 \times 10^{-5}$$

$$\text{pH} = -\log(2.70 \times 10^{-5}) = \underline{4.568} = 4.57 = \text{pH}$$