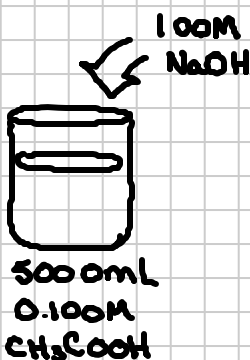


Titration of a weak acid with a strong base:

Note Title

3/7/2010



How many mL of NaOH required to reach the equivalence point?

What is the pH @ the equivalence point?

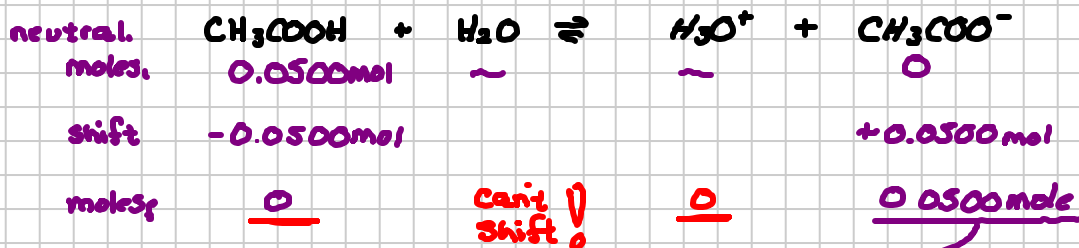
Equi point # moles acid = # moles base

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

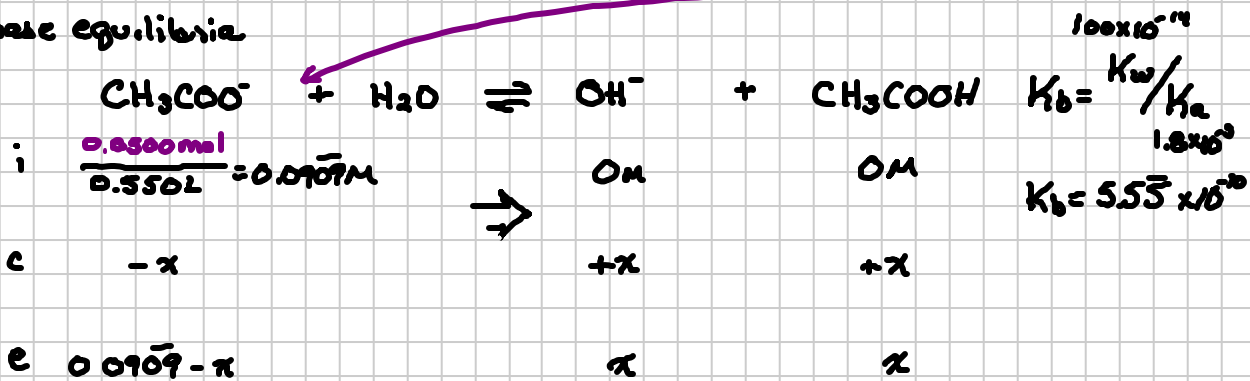
$$\text{moles NaOH} = \text{moles CH}_3\text{COOH}$$

$$\text{moles NaOH} = 0.0500 \text{ moles}$$

$$\text{Vol NaOH} = \frac{\text{moles}}{\text{M}} = \frac{0.0500 \text{ mol}}{1.00\text{M}} = 0.0500\text{L} = \underline{\underline{50.0 \text{ mL NaOH}}}$$



Weak base equilibria



$$K_b = \frac{[\text{OH}^-][\text{CH}_3\text{COOH}]}{[\text{CH}_3\text{COO}^-]} \left\{ 5.55 \times 10^{-10} = \frac{x \cdot x}{(0.0909 - x)} \right\} \left\{ x = 7.1066 \times 10^{-6} (0.008\%) \right.$$

x ≈ 0

$$x = [\text{OH}^-] = 7.1066 \times 10^{-6}$$

$$\text{pOH} = -\log(7.1066 \times 10^{-6}) = 5.14$$

$$\text{pH} = 14 - \text{pOH} = \underline{\underline{8.85}} \text{ @ equi. point. } \underline{\underline{50.0 \text{ mL NaOH}}}$$