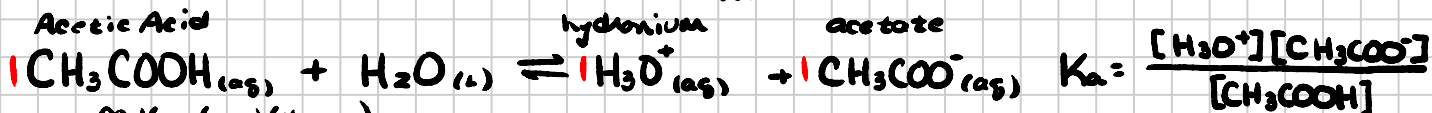


Solution #3

Equilibrium



initial (dilution)

$$m_2 = \frac{M_1 V_1}{V_2} = \frac{(1.00)(100 \text{ mL})}{(140 \text{ mL})}$$

$$m_2 = \frac{M_1 V_1}{V_2} = \frac{(1.00)(40.00 \text{ mL})}{(140.00 \text{ mL})}$$

$$m_2 = \underline{0.28571 \text{ M}}$$

~ Shift \rightarrow 0.00 M

$$m_2 = \underline{0.71429 \text{ M}}$$

change

-x

+x

+x

equilibrium $0.28571 - x$

+x

$0.71429 + x$

L.M.A.

$$K_a = \frac{[\text{H}_3\text{O}^+][\text{CH}_3\text{COO}^-]}{[\text{CH}_3\text{COOH}]} = \frac{x(0.71429 + x)}{(0.28571 - x)}$$

$$x = [\text{H}_3\text{O}^+]$$

$$\text{pH} = -\log_{10} [\text{H}_3\text{O}^+]$$

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

← measure