Answer on Question 74415 in General Chemistry

1.C_M=0.165 M

pK_a =5.02

pH=?

Solution:

We write down the dissociation of a weak acid

HA=$H^+ + A^-$ $K_a = \frac{[H^+]\times[A^-]}{[HA]}$

Not difficult to see that $[H^+]$= $[A^-]$ $K_a = \frac{[H^+]^2}{[HA]}$

K_a =10^{-pK}=$10^{-5.02}$=9.549×10^{-6}

$[H^+]$= $\sqrt{K_a \times [HA]} = \sqrt{0.165 \times 9.549 \times 10^{-6}}$=$1.25\times 10^{-3}$

pH=- lg $[H^+]$ = - lg 1.25×10^{-3}= 2.9

2.V=1 L

.c(CH_3COOH)=0.1 M

.c(CH_3COONa) = 0.063 M

$$K_a = 1.8 \times 10^{-5}$$

when we mix solutions of acetic acid and sodium acetate, we get an acetate buffer solution

. The pH of the buffer solution is calculated using the Henderson-Hasselbach equation

.pH= pK_a+ lg$\frac{[CH_3COONa]}{[CH_3COOH]}$

.pK=-lg K_a=-lg 1.8×10^{-5}=4.74

.pH=4.74+lg$\frac{0.063}{0.1}$ =4.54

Answer provided by www.AssignmentExpert.com