Answer on Question #82389, Chemistry / General Chemistry

Calculate pH of solution containing 0.15 M weak acid HA and 0.2 M sodium salt NaA pKa HA = 4.66

Solution

Solutions of weak acid and its sodium salt form buffer solution, where

$K_a = \frac{[H^+]\times[A^-]}{[HA]} = \frac{[H^+]\times[NaA]}{[HA]}$; $[H^+]$, [HA], [NaA] – concentrations;

Find K_a:

$K_a = 10^{-4.66} = 2.19 \times 10^{-5}$

Find $[H^+]$:

$[H^+] = \frac{K_a\times[HA]}{[NaA]} = \frac{2.19\times10^{-5}\times 0.15}{0.2} = 1.64 \times 10^{-5}$ (M)

Find pH of solution:

$pH = -\lg(1.64 \times 10^{-5}) =$ **4.78**

Answer

4.78 – pH of solution containing 0.15 M weak acid HA and 0.2 M sodium salt NaA.