

Answer on Question #79924 - Chemistry - Physical Chemistry

Question:

what will be the pH of the solution if zero point zero one mole of HCl is dissolved in a buffer solution containing zero point zero two moles of propanoic acid and K_a equal to one point three four into ten to the power minus five and zero point zero one five moles of salt at twenty five degree Celsius

Solution:

$$K_a = 1.34 \times 10^{-5}$$

$$c(\text{salt}) = 0.0152 \text{ M};$$

$$c(\text{HCl}) = 0.01 \text{ M};$$

$$[\text{H}^+] = c(\text{salt}) \times K_a = 0.00045 \text{ M};$$

$$[\text{H}^+]_{\text{total}} = 0.00045 + 0.01 = 0.01045;$$

$$\text{pH} = -\lg[\text{H}^+] = 1.98.$$

Answer: 1.98.

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