

Answer on Question #82390 – Chemistry – General Chemistry

Calculate the pH of 0.350 M ammonium chloride, NH_4Cl at 50°C $pK_b \text{NH}_3 = 3.82$ at 50°C

Solution:

Weak acid $\text{NH}_4\text{Cl} \rightarrow \text{NH}_4^+ + \text{Cl}^-$

$$pH = \frac{1}{2} pK_{a, \text{NH}_4^+} - \frac{1}{2} \lg C_{\text{NH}_4^+}$$

$$pK_{a, \text{NH}_4^+} = 14 - pK_{b, \text{NH}_3} = 14 - 3.82 = 10.18$$

$$pH = \frac{1}{2} \times 10.18 - \frac{1}{2} \times \lg(0.350) = 5.32$$

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