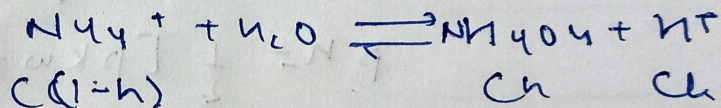


Calculate the amt. of ^{Amm.} Chloride req. brined to dissolve 500ml of water to have pH 4.5 [K_b for NH₄OH = 1.8 × 10⁻⁵]

Soln $[H^+] = 10^{-pH} \Rightarrow 10^{-4.5} = 10^{\sqrt{}} \text{antilog } 0.5$
 $= 3.162 \times 10^{-5} M.$

Let C be conc. of NH₄Cl



if h is small

$$K_h = Ch^2$$

$$\left[K_h = \frac{K_w}{K_b} = \frac{10^{-14}}{1.8 \times 10^{-5}} = 5.5 \times 10^{-10} \right]$$

$$h = \frac{K_h}{Ch} = \frac{K_h}{[H^+]} = 1.739 \times 10^{-5}$$

$$Ch = [H^+] \Rightarrow h = \frac{[H^+]}{C}$$

$$\Rightarrow h = \frac{3.162 \times 10^{-5}}{1.739 \times 10^{-5}} = 1.8 \text{ mol } L^{-1} \quad \text{500ml contain} = \frac{1.8}{L} = 0.9 \text{ mole}$$

$$\text{Mass} = 0.9 \times 53.5 = \boxed{48.15 \text{ g}}$$