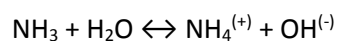


#64878 Chemistry, General Chemistry

How many grams of dry NH_4Cl need to be added to 1.60 L of a 0.200 M solution of ammonia, NH_3 , to prepare a buffer solution that has a pH of 8.85? K_b for ammonia is 1.8×10^{-5} .

Answer:



The K_b is small so it is possible to say that all the $\text{NH}_4^{(+)}$ is released from NH_4Cl and the concentration of NH_3 will not change .

$$C \text{ of } \text{NH}_3 = 0.200 \text{ M}$$

$$\text{pOH} = 14 - 8.85$$

$$C \text{ of } \text{OH}^{(-)} = 10^{(-\text{pOH})}$$

$$1.8 \cdot 10^{-5} = [C(\text{OH}) \cdot C(\text{NH}_4)] / C(\text{NH}_3)$$

$$M (\text{NH}_4\text{Cl}) =$$

$$m (\text{NH}_4\text{Cl}) = [1.6 \text{ liters}] \cdot [C(\text{NH}_4)] \cdot [\text{molecular weigh of } \text{NH}_4\text{Cl}] = 1.6 \cdot 0.200 \cdot 53.5 = 17.1 \text{ g}$$

Answer provided by <https://www.AssignmentExpert.com>