Name:_____Date:_____Block:____

Chapter 10 – Acid Base Equilibrium

Super Problem

$NH_3(aq) + H_2O(l) \leftrightarrow NH_4^+(aq) + OH^-(aq)$ $\quad Kb = 1.80 \times 10^{-5}$

Ammonia reacts with water as indicated in the reaction above.

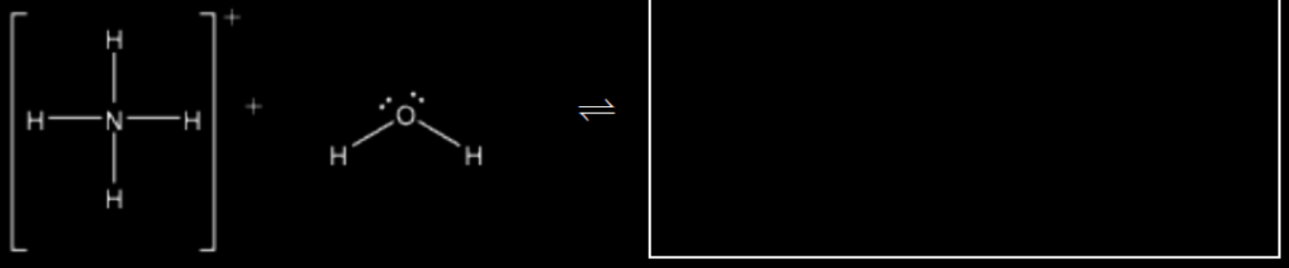
(a) Write the expression for the equilibrium constant for the reaction represented above.

(b) Calculate the pH of a 0.150 M solution of NH_3.

(c) Determine the percent ionization of the weak base NH_3.

(d) Calculate the hydronium ion, H_3O^+, concentration in the above solution. Be sure to include units with your answer.

When a specified amount of ammonium nitrate (NH_4NO_3) is dissolved in water, the ammonium ions hydrolyze the water according to the partial reaction shown below. The resulting solution has a pH of 4.827.



(e) Complete the reaction above by drawing the complete Lewis structures for both products of the hydrolysis reaction.

(f) Determine the

(i) molarity (M) of the ammonium ions in this solution

(ii) number of moles of ammonium ions in 250 mL of the above solution