CHE 141 13\textsuperscript{th} Workshop Problems

1. Suppose you had 1.0 L of a 0.5 M NH\textsubscript{3} solution.

(a) How many moles of HCl gas would you need to add to the solution to make a pH 9 buffer?

(b) Test your buffer by calculating the new pH after the addition of 2.0 grams of solid NaOH.

2. How much sodium acetate (mol. wt. 82 g/mol) must be added to 50 mL of 0.25 M acetic acid solution to produce a buffer with a pH of 4.94? \([K_a = 1.8 \times 10^{-5}]\)

3. What is the pH at the equivalence point of the titration of 50 mL 0.1 M NH\textsubscript{3} with 0.2 M HNO\textsubscript{3} solution? \([K_b = 1.8 \times 10^{-5}]\)

4. In order to determine the p\(K_a\) of a weak acid, the pH of a buffer solution containing the weak acid at a concentration of 0.4 M and its conjugate base at a concentration of 0.6 M was measured and found to be 7.8. What is the p\(K_a\) of a weak acid?