

Prelab Question – Experiment 3: Acids, Bases, and Buffers, Week 3

Sodium acetate trihydrate: MM= 136.08 g/mol $pK_b = 9.25$

Ammonium chloride: MM= 53.49 g/mol $pK_a = 9.25$

1. Choosing between the salts sodium acetate trihydrate and ammonium chloride:

a) Which salt will make a weak acid solution? _____

b) Which salt will make a weak base solution? _____

You have 0.10 M HCl and 0.10 M NaOH solutions available to make buffers with the two above salts.

c) Which solution do you add to sodium acetate to make a buffer? _____

d) What is the conjugate acid/base formed? _____

e) At what approximate pH (5 or 9) will this buffer work best? _____

f) Which solution do you add to ammonium chloride to make a buffer? _____

g) What is the conjugate acid/base formed? _____

h) At what approximate pH (5 or 9) will this buffer work best? _____

2. You want to make 100.0 mL of 0.10 M sodium acetate trihydrate and 100.0 mL of 0.10 M ammonium chloride. Calculate how much of each weak acid/weak base salt to measure (in grams) to make these solutions.

3. Calculate the pH of a buffer solution made by mixing 100.0 mL of 0.200 M benzoic acid with 100.0 mL of 0.100 M NaOH. Use Appendix D in your textbook as a reference.