Chemistry 146 – Van Bramer
Spring Problem Set – Week 11

Acid-Base Buffers and Titrations Problem Set

This problem set was developed by S.E. Van Bramer for Chemistry 146 at Widener University.

For each of the following solutions:

a. Describe (in words) what happens.
b. Write a chemical equation that describes what happens.
c. What is the proton donor? Why?
d. What is the proton acceptor? Why
e. After this solution has reached equlibrium: What species are present? What is their concentration? What is the pH and pOH?

1. Benzoic Acid (C_6H_5COOH) is a solid. 15.000 grams is dissolved in distilled water and diluted to 200.00 mL.

2. Sodium benzoate (NaC_6H_5COO) is a solid. Used as a preservative in most pop (or back east you call it soda). 10.000 grams is dissolved in distilled water and diluted to 100.00 mL.

3. Sodium Hydroxide is a solid. 5.0000 grams is dissolved in 50.0 mL of distilled water.

4. The benzoic acid solution and the sodium benzoate solution are mixed together in a large flask.

5. 1.00 mL of the sodium hydroxide solution is added to the buffer.

6. 10.00 mL of the sodium hydroxide solution is added to the buffer.

7. 25.00 mL of the sodium hydroxide solution is added to the buffer.