

Homework #5

5.1. Titration Curve

Hypochlorous acid (HOCl) is used as a disinfectant in water and wastewater treatment. For purposes of disinfection HOCl is the preferred species in solution (HOCl can be as much as 100x as effective as OCl^- as a disinfectant). However, it is more convenient to add the chemical as NaOCl. Determine the pH of a 10^{-3}F NaOCl solution and draw a titration curve for this solution indicating the pH at the beginning, middle and end of the titration.

5.2 Buffer Intensity

Draw a figure showing buffer intensity vs pH for the above solution.

5.3 Buffer Calculations

You wish to prepare a test solution that is buffered at pH 8.2. The reactor is to be operated at 25°C . After careful study you have chosen to use a phosphate buffer.

a. pH

What is the ratio of NaH_2PO_4 to Na_2HPO_4 that should be used?

b. Intensity

What is the minimum total phosphate concentration that must be used if the pH is not to deviate from 8.2 by more than 0.02 units, when 10^{-4} F strong acid or base is added?

Assigned: 13 Mar 20

Due: 30 Mar 20