PLI 36
Thursday July 21, 2016

Chapter 17

1. A 1.0-L buffer solution contains 0.100 mol acetic acid and 0.100 mol sodium acetate. The value of K_a for acetic acid is 1.8×10^{-5}. Calculate the new pH after adding 0.010 mol of solid NaOH to the buffer. For comparison, calculate the pH after adding 0.010 mol of solid NaOH to 1.0 L of pure water.

2. A 500.0-mL buffer solution is 0.100 M in HNO_2 and 0.150 M in KNO_2. Determine if each addition would exceed the capacity of the buffer to neutralize it.

    a. 2.50 g NaOH

    b. 1.25 g HBr

    c. 3.60 g KOH

    d. 1.35 g HI

3. A chemist has synthesized a monoprotic weak acid and wants to determine its K_a value. To do so, the chemist dissolves 2.00 millimoles of the solid acid in 100.0 mL of water and titrates the resulting solution with 0.0500 M NaOH. After 20.0 mL NaOH has been added, the pH is 6.00. What is the K_a value for the acid?

4. Find the pH at each of the following points in the titration of 25 mL of 0.30 M HF with 0.30 M NaOH. The Ka HF=7.2 x 10^{-4}
    a. Before adding NaOH

    b. After adding 10.00 mL of NaOH

    c. At ½ equivalence point

    d. At the equivalence point

    e. After adding 28.00 mL of NaOH

5. A solution is prepared by adding 750.0 mL of 4.00 x 10^{-3} M $Ce(NO_3)_3$ to 300.0 mL of 2.00 x 10^{-2} M KIO_3. Will $Ce(IO_3)_3$ (K_{sp} = 1.9 x 10^{-10}) precipitate from this solution?