LECTURE 24

1. 50.0 mL of 0.10 M acetic acid (CH_3COOH (aq)) is titrated 0.20 M NaOH (aq). The K_a of acetic acid is 1.74 x 10^{-5}.
(a) Calculate the volume of 0.20 M NaOH required to reach the equivalence point.
(b) Calculate the pH at the equivalence point.
(c) Calculate the pH after the addition of 2.00 mL of NaOH _past_ the equivalence point.

(a) 25 mL
(b) 8.79
(c) 11.72

2. Methylamine a weak base with a K_b of 5.6 x 10^{-4}. A 75 mL sample of 0.500 M solution of methylamine in water is titrated with a 0.205 M solution of HCl, a strong acid. Calculate the pH of the solution at the given point during the titration.
(a) before any acid is added.
(b) at the half-equivalence point.
(c) at the equivalence point.
(d) 1.00 mL past the equivalence point.

   (a) The pH of the solution before any acid is added is 12.22.

   (b) At the half-equivalence point the pH = pK_a = 10.75.

   (c) The pH of the titration at the equivalence point is 5.78 (or 5.79).

   (d) The pH of the titration 1.00 mL past the equivalence point is 3.10 (or 3.11).

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