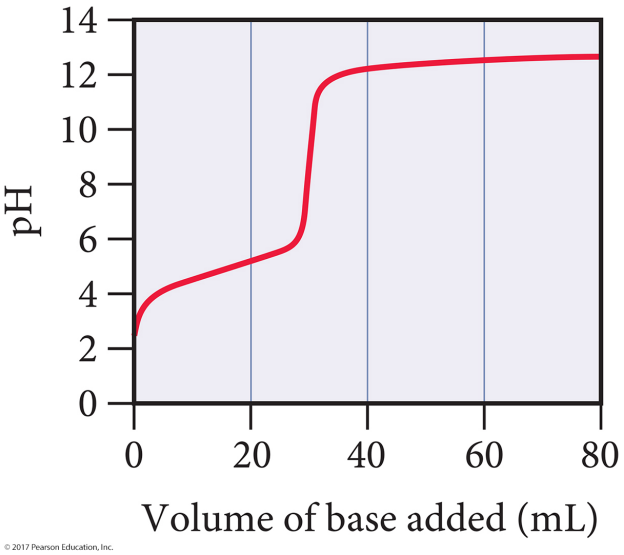
1. Consider the curve shown here for the titration of a weak monoprotic acid with a strong base.



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   (a) What is the pH and what is the volume of added base at the equivalence point?

   (b) What is the K_a of the acid?

   (c) If the base was 0.100 M NaOH and 25.00 mL of weak acid was originally titrated, what was the concentration of the original weak acid?

2. Consider the titration of 0.446 g of unknown monoprotic acid with 0.105 M KOH. If 35.00 mL of KOH was required to reach the end point of the titration, what is the molar mass of the acid?

3. Consider the titration of 20.0 mL of 0.105 M acetic acid ($K_a = 1.8 \times 10^{-5}$) with 0.125 M NaOH. Determine each quantity.

   (a) The initial pH

   (b) The volume of base required to reach the equivalence point

   (c) The pH at 5.0 mL of added base

   (d) The pH at one-half of the equivalence point

   (e) The pH at the equivalence point

   (f) The pH after added 5.0 mL of base beyond the equivalence point

(blank)

4. Consider the titration of 25.0 mL of 0.175 M CH_3NH_2 ($K_b = 4.4 \times 10^{-4}$) with 0.150 M HBr. Determine each quantity.

   (a) The initial pH

   (b) The volume of acid required to reach the equivalence point

   (c) The pH at 5.0 mL of added acid

   (d) The pH at one-half of the equivalence point

   (e) The pH at the equivalence point

   (f) The pH after added 5.0 mL of acid beyond the equivalence point

(blank)

5. Calculate the molar solubility of $Mg(OH)_2$ ($K_{sp} = 2.06 \times 10^{-13}$) in pure water.

6. Calculate the molar solubility of $Mg(OH)_2$ ($K_{sp} = 2.06 \times 10^{-13}$) in a solution with $pH = 13.00$.