

Worksheet 7

- 100 mL of 0.200 M HCl is titrated with 0.400 M NaOH.
 - What is the pH after 30 mL of base has been added?

 - What is the pH at the equivalence point?

- A certain weak acid HA has a K_a value of 5.61×10^{-6} and is titrated with NaOH.
 - What is the pH of the solution if 9.00 mmol of HA is titrated with 2.00 mmol of the base?

 - What is the pH of the solution at the equivalence point if the total volume is 43 mL?

- 68.0 mL of 0.25 M HBr is titrated with 0.50 M KOH. Calculate the pH after the addition of 34.0 mL of KOH at 25°C.

- Calculate the pH after 40.0 mL of 0.20 M NH_3 is titrated with 20.0 mL of 0.40 M HNO_3 . The K_b for NH_3 is 1.8×10^{-5} .

- 30.0 mL of 0.50 M CH_3COOH was titrated with 30 mL of 0.50 M NaOH. The K_a of CH_3COOH is 1.8×10^{-5} .

6. BONUS: H_2SO_3 has $K_{a1} = 5.9 \times 10^{-3}$ and $K_{a2} = 6.0 \times 10^{-6}$. Calculate the pH of a solution of 70 mL of 0.10 M H_2SO_3 titrated with:

(a) 0 mL of 0.10 M KOH (Before titration)

(b) 50 mL of 0.10 M KOH

(c) 70 mL of 0.10 M KOH

(d) 120 mL of 0.10 M KOH

(e) 200 mL of 0.10 M KOH

(f) Draw a pH vs volume plot for this reaction and identify the equivalence point(s) and half equivalence point(s). What is significant about the pH at a half equivalence point?