

Strong acid-strong base titration

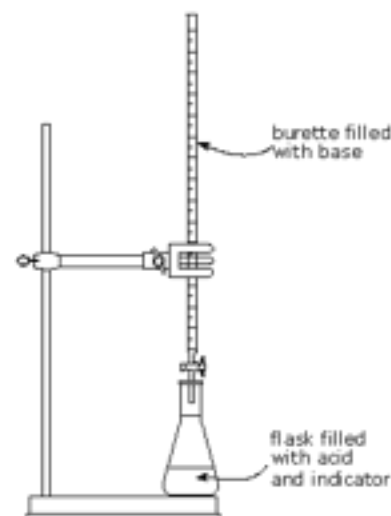
Purpose: To determine the concentration of hydrochloric acid using an acid base titration.

Materials: 0.1 M Sodium hydroxide; hydrochloric acid of unknown concentration; phenolphthalein indicator; distilled water.

Apparatus: Graduated cylinder, 250 mL Erlenmeyer flask, burette

Procedure:

- 1) Create an appropriate data table to record your data. Use a ruler and be sure to include labels, headings and units.
- 2) Put on goggles! Goggles removed during the lab will result in a zero.
- 3) Set up apparatus as shown in class.
- 4) Wash all equipment with distilled water.
- 5) Rinse the burette with small amount of base. Discard in waste container.
- 6) Put exactly 10.0 mL of Hydrochloric Acid into the Erlenmeyer flask. Add 2 drops of indicator.
- 7) Ensure burette is in closed position. Fill the burette with the Sodium Hydroxide and record the initial volume in a table to two decimal places.
- 8) Begin the titration by adding base to the flask. Swirl the flask. Go very slowly when the colour change begins to linger. When the colour change is permanent, this is called the end point. Record volume of base used.
- 9) Repeat procedure.



Calculations:

- 1) Write a balanced equation for the reaction of Sodium Hydroxide and Hydrochloric Acid.
- 2) At the equivalence point, the acid and base are in equal amounts. Calculate the concentration of hydrochloric acid.

Questions:

- 1) How is the end point of a titration different from the equivalence point? Define each.
- 2) Why are the burette and pipette rinsed in the solutions placed in them?
- 3) What will be the effect of rinsing the Erlenmeyer flask with the acid solution to be placed in it?
- 4) Is it important to ensure that the Erlenmeyer flask is perfectly dry before adding the acid? If not, why not?
- 5) Why must the air in the buret jet be expelled before the initial volume is recorded?
- 6) What are the possible sources of error in an acid base titration?