ANALYTICAL CHEMISTRY

Read the details of the information given below from Skoog and West's "Fundamentals of Analytical Chemistry" book, which is recommended as a reference.

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Titrations in Analytical Chemistry

Gravimetric Titrations

Titration Curves

13D Gravimetric titrations

- Differ from their volumetric counterparts in that **the mass of titrant** is measured rather than the volume.

- A **balance** and a **weighable solution dispenser** are substituted for a buret and its markings.

13D-1 Calculations associated with mass titrations

$$\text{weight molar concentration} = \frac{\text{no. mol A}}{\text{no. kg solution}} = \frac{\text{no. mmol A}}{\text{no. g solution}}$$

$$c_w(\text{A}) = \frac{n_\text{A}}{m_\text{soln}}$$

13D-2 Advantages of gravimetric titrations

1. Calibration of glassware and tedious cleaning to ensure proper drainage are completely eliminated.
2. Temperature corrections are unnecessary because the mass (weight) molar concentration does not change with temperature.
3. Mass measurements can be made with considerably greater precision and accuracy than can volume measurements.
4. Gravimetric titrations are more easily automated than are volumetric titrations.

13E Titration curves

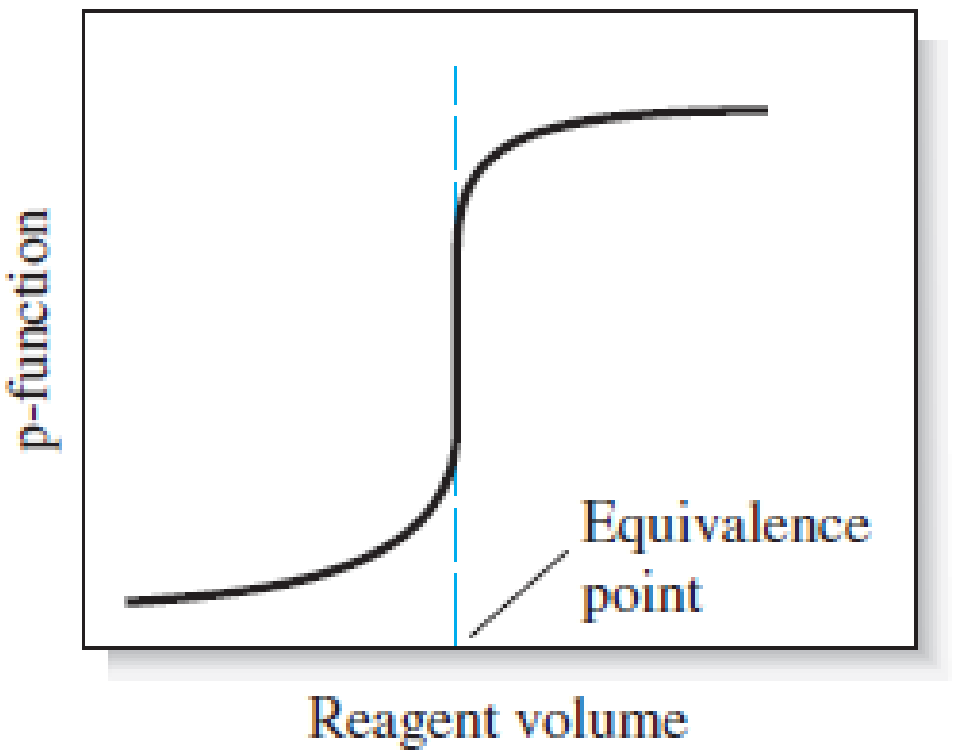
An **end point** is signaled by an observable physical change near the equivalence point of a titration:

- changes in color due to the reagent (titrant), the analyte, or an indicator
- a change in potential of an electrode that responds to the titrant concentration or the analyte concentration.

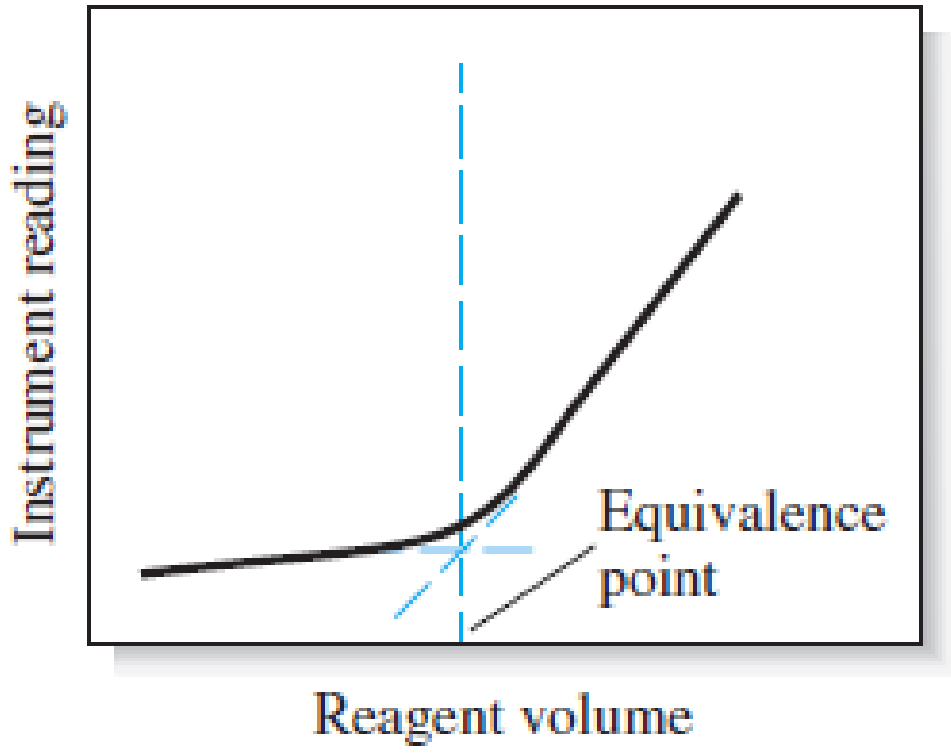
Titration curves are plots of a concentration-related variable versus titrant volume.

Types of titration curves

Two general types of titration curves:



(a) Sigmoidal curve



(b) Linear segment curve

Concentration changes during titrations