Titration Glossary

Aliquot: A measured volume of a solution taken for analysis, usually transferred with a pipette.

Analyte: The substance of unknown concentration being analyzed or titrated.

Anhydrous: Describes a compound or substance free of water, often used when preparing standard solutions.

Back Titration: A method where an excess of reagent is added to react with the analyte, and the remaining reagent is then titrated to determine the analyte concentration indirectly.

Balanced Chemical Equation: A chemical equation showing the stoichiometric relationship between reactants and products, essential for calculating titration results.

Base: A substance that can accept protons or donate hydroxide ions in an acid–base titration.

Burette: A long, graduated glass tube with a stopcock at the bottom, used to deliver measured volumes of titrant accurately.

Calibration: The process of verifying and adjusting the accuracy of laboratory equipment, such as burettes or pH meters, to ensure precise readings.

Color Change: A visible signal from an indicator showing that the endpoint of the titration has been reached.

Complexometric Titration: A titration based on the formation of a stable complex between the analyte (usually a metal ion) and the titrant, commonly using EDTA.

Concentration: The amount of solute dissolved in a given volume of solution, expressed in molarity (mol/L) or other units.

Conductometric Titration: A titration that measures changes in the electrical conductivity of the solution to determine the endpoint.

End Point: The experimentally observed stage in a titration when a measurable change, such as a color shift or pH change, indicates that the reaction is complete.

Equivalence Point: The theoretical point in a titration at which the amount of titrant added reacts exactly with the amount of analyte present, according to stoichiometry.

Erlenmeyer Flask (Conical Flask): A piece of glassware with a conical shape used to contain the analyte during titration; it allows easy mixing without splashing.

Indicator: A dye or chemical compound that changes color or other property near the equivalence point, helping identify the endpoint.

Meniscus: The curved surface of a liquid in a burette or pipette; readings are taken from the bottom of the meniscus at eye level.

Molarity (M): A unit of concentration equal to moles of solute per liter of solution (mol/L).

Neutralization: A chemical reaction between an acid and a base producing a salt and water; the basis for acid–base titration.

Pipette: A narrow glass or plastic tube calibrated to deliver an exact volume of liquid, used to measure the analyte solution.

pH: A numerical measure of hydrogen ion concentration, indicating acidity or alkalinity; changes in pH are used to monitor titration progress.

pH Meter: An instrument that measures the hydrogen ion activity of a solution and provides a precise endpoint in acid–base titrations.

Potentiometric Titration: A titration in which the change in electric potential between electrodes is measured to identify the equivalence point.

Precision: The degree of reproducibility of repeated titration results under the same conditions.

Primary Standard: A highly pure, stable substance used to prepare a standard solution of known concentration.

Quantitative Analysis: A method used to determine how much of a substance is present in a sample, as opposed to qualitative analysis, which identifies what is present.

Redox Titration: A titration based on oxidation–reduction reactions, where electrons are transferred between the analyte and titrant.

Repeatability: The ability to obtain consistent results when a titration is repeated under identical conditions.

Secondary Standard: A solution whose concentration is determined by titrating it against a primary standard.

Standard Solution: A solution of precisely known concentration used as the titrant in a titration.

Stoichiometry: The quantitative relationship between reactants and products in a balanced chemical equation; used to calculate unknown concentrations.

Titrant: The standard solution of known concentration that is gradually added from the burette to react with the analyte.

Titration: A quantitative analytical technique in which a solution of known concentration is slowly added to a solution of unknown concentration until the reaction reaches completion, allowing the unknown concentration to be calculated.

Titration Curve: A graph showing how a measurable property (such as pH or potential) changes with the volume of titrant added, used to determine the equivalence point.

Volumetric Analysis: A class of analytical techniques, including titration, that use measured solution volumes to determine concentration.

Volumetric Flask: A flask calibrated to contain an exact volume of liquid, used for preparing precise standard solutions.

White Tile: A light-colored surface placed beneath the flask during titration to make color changes in the indicator easier to see.