**Lab-2-** Prepared by MSc.Ala J.Ahmad

**Classical methods for analytical chemistry**

[](https://en.wikipedia.org/wiki/File:Flame_test.jpg)

Although modern analytical chemistry is dominated by sophisticated instrumentation, the roots of analytical chemistry and some of the principles used in modern instruments are from traditional techniques, many of which are still used today. These techniques also tend to form the backbone of most undergraduate analytical chemistry educational labs.

**1.Qualitative analysis**

Qualitative analysis determines the presence or absence of a particular compound, but not the mass or concentration. By definition, qualitative analyses do not measure quantity.

**Chemical tests**

There are numerous qualitative chemical tests, for example, the [acid test](https://en.wikipedia.org/wiki/Acid_test_(gold)) for [gold](https://en.wikipedia.org/wiki/Gold) and the [Kastle-Meyer test](https://en.wikipedia.org/wiki/Kastle-Meyer_test) for the presence of [blood](https://en.wikipedia.org/wiki/Blood).

**Flame test**

Inorganic qualitative analysis generally refers to a systematic scheme to confirm the presence of certain aqueous ions or elements by performing a series of reactions that eliminate ranges of possibilities and then confirms suspected ions with a confirming test. Sometimes small carbon-containing ions are included in such schemes. With modern instrumentation, these tests are rarely used but can be useful for educational purposes and in fieldwork or other situations where access to state-of-the-art instruments is not available or expedient.

**2.Quantitative analysis**

Quantitative analysis is the measurement of the quantities of particular chemical constituents present in a substance. Quantities can be measured by mass (gravimetric analysis) or volume (volumetric analysis).

**Gravimetric analysis**

Gravimetric analysis involves determining the amount of material present by weighing the sample before and/or after some transformation. A common example used in undergraduate education is the determination of the amount of water in a hydrate by heating the sample to remove the water such that the difference in weight is due to the loss of water.

**Volumetric analysis**

[Titration](https://en.wikipedia.org/wiki/Titration)

Titration involves the addition of a reactant to a solution being analyzed until some equivalence point is reached. Often the amount of material in the solution being analyzed may be determined. Most familiar to those who have taken chemistry during secondary education is the acid-base titration involving a color-changing indicator. There are many other types of titrations, for example, potentiometric titrations. These titrations may use different types of indicators to reach some equivalence point.