

## Flame Atomic absorption spectroscopy (FAAS)

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Flame Atomic Absorption is a very common technique for detecting metals present in samples. The technique is based on the principle that ground state metals absorb light at a specific wavelength. Metal ions in a solution are converted to atomic state by means of a flame. When light of the correct wavelength is supplied, the amount of light absorbed is measured and a reading for concentration can be obtained. Flame atomic absorption is a very accurate quantitative technique and also a good qualitative technique. This is one of the main reasons it is the most widely used of the atomic absorption methods.

## UV-Visible spectrophotometer

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The instrument functions by emitting a beam of light from a visible and/or UV light source (colored red) is separated into its component wavelengths by a prism or diffraction grating. Each monochromatic (single wavelength) beam in turn is split into two equal intensity beams by a half-mirrored device. One beam, the sample beam (colored magenta), passes through a small transparent container (cuvette) containing a solution of the compound being studied in a transparent solvent. The other beam, the reference (colored blue), passes through an identical cuvette containing only the solvent. The intensities of these light beams are then measured by electronic detectors and compared. The intensity of the reference beam, which should have suffered little or no light absorption, is defined as  $I_0$ . The intensity of the sample beam is defined as  $I$ . Over a short period of time, the spectrometer automatically scans all the component wavelengths in the manner described. The ultraviolet (UV) region scanned is normally from 200 to 400 nm, and the visible portion is from 400 to 800 nm.

## pH Meter

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A pH meter provides a value as to how acidic or alkaline a liquid is. The basic principle of the pH meter is to measure the concentration of hydrogen ions. Acids dissolve in water forming positively charged hydrogen ions ( $H^+$ ). The greater this concentration of hydrogen ions, the stronger the acid is.

## Total Dissolved Solids Meter

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A TDS meter can be a small hand-held device used to indicate the Total Dissolved Solids in a solution, usually water. Since dissolved ionized solids such as salts and minerals increase the conductivity of a solution, a TDS meter measures the conductivity of the solution and estimates the TDS from that reading.

## Hot air Oven

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This is an electrical device which uses dry heat to sterilize or dry. They were originally developed by Pasteur. Generally, they can be operated from 50 to 300 °C, using a thermostat to control the temperature

## Muffle Furnace

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A muffle furnace is a furnace with an externally heated chamber, the walls of which radiantly heat the contents of the chamber, so that the material being heated has no contact with the flame.

Muffle furnaces are most often utilized in laboratories as a compact means of creating extremely high-temperature atmospheres.