

Flame emission photometry

The determination of some elements, such as sodium, potassium or lithium, can be made by measuring the intensity of light of a certain wavelength emitted after the atoms of the element in question have been excited by the flame. The diluted sample is pulverised into a fine mist. This is fed into a colourless propane or acetylene flame in which the solvent dries, atomization (breaking of the covalent bonds of the molecules), excitation of the atoms and spontaneous de-excitation, which releases a photon, occur in very short succession. This travels through a monochromator to a detector, e.g. a photomultiplier tube. The intensity of the radiation, which is proportional to the concentration of the element to be measured in the sample, is recorded. To ensure reliable results, an internal standard (usually lithium or potassium salts) must be used to compensate for fluctuations in gas pressure and hence flame and detector instability. Due to the difficulty of the measurements, the difficulty of automation and the problematic interpretation of some results, flame photometry is not widely used in clinical biochemistry today, being replaced mainly by electrochemical methods using ion selective electrodes (ISE).