Answer on Question #48785 - Chemistry – Other

Question

how the flame spectrometer does work?

Answer:

A spectrometer is a tool that scientists use to gather information about a substance based on the visible, ultraviolet or infrared light that it projects, and can be used in different fields of science.

A flame spectrometer heats the atoms of a sample to an excited state and then analyzes the resulting emitted spectra to determine the atomic makeup of the sample. A sample is excited by a burner or nebulizer/burner combination, thereby exciting electrons into a higher energy state (also known as "incandescence"). These excited electrons emit energy waves that are characteristic of the atomic makeup of the material. The spectrometer examines the emitted spectrum of resulting waves to determine the sample's constituent elements. Proper identification depends on comparison of observed spectrum patterns with indexed patterns already stored in some database. The quantity that is measured in flame spectroscopy is an energy level, not a physical substance.

To use a spectrometer, turn it on and wait about five minutes for it to heat up. A reference substance is then loaded and calibrated and a spectrum is determined for sample. The wavelengths are then measured and analyzed. The item in question is loaded. Light is passed through the machine and readings are made based on the colors and information that is reflected.