

### (a) Atomic Spectra

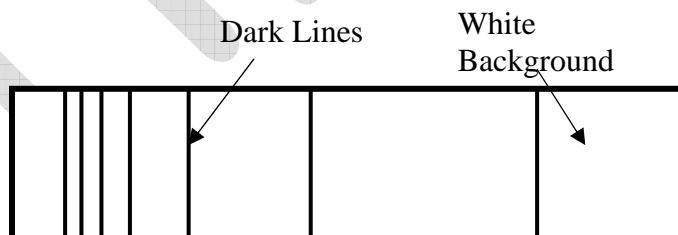
When atoms or molecules are exposed to the electromagnetic radiation, they may absorb photon of certain frequencies and reach to the higher quantum state. While returning to the normal or ground state, they emit radiations of different frequencies. Atoms give discontinuous or line spectrum consisting of bright lines or bands separate from each other by a dark space. There are two types of atomic spectra.

**i. Atomic Emission Spectra:** When a sample of atomic vapours is suitably excited by either heating to high temperature or passing electric current through it, emit radiation of certain wavelength (or frequencies). This emitted radiation produces a spectrum consisting of bright lines in black background known as atomic emission spectra. Each line in the emission spectrum corresponds to a specific wavelength and no two elements give the same



**ii. Atomic Absorption Spectra:** When white light is passed through the same atomic gas, it absorbs light of certain wavelength present in the emission spectrum. The resulting spectrum consisting of dark lines on white background is known as absorption spectrum.

Dark lines in the absorption spectrum and bright lines in the emission spectrum of the same elements appear at the same wavelength.



Since each element gives characteristic line spectrum, hence the atomic spectrum is used for element analysis.