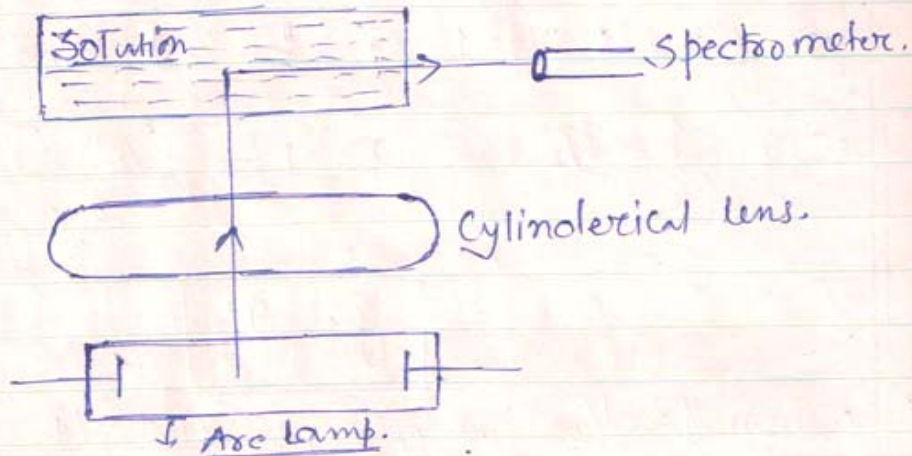




## Raman Effect: (Elementary idea):



A Strong beam of light from an arc lamp. was focused by a cylindrical lens on a glass jar containing a liquid. It was found that when the beam encountered a material medium in the jar, it got scattered in all directions. The wave length of the scattered light was measured by the Spectrometer. Two distinct cases may arise.

(1) If the size of the particle in the material medium which scatters the light is large compared with the wave length, then the scattering is known as elastic scattering or coherent scattering & the frequency of the scattered lines remains same as those.



of the incident lines. This phenomenon is known as Tyndal Effect. Tyndal effect is observed when light is scattered by dust particles or foreign particles present in air or by colloidal solution.

② If the size of the particles are small or comparable to the wavelength of light it is known as Rayleigh's Scattering & the frequency of the lines changes.

In Raman effect it is found that when light is scattered from a pure solution free from dust particles or colloidal suspension. Looking along the forward direction it is found that the spectral lines of the given frequency splits into several lines having frequency on both the sides of the incident frequency. The number of <sup>spectral</sup> lines is more towards the lower frequency side and are more intense than the lines towards the higher frequency. Most of these new lines are strongly polarised and their spacing is symmetrical about the main lines. These are generally known as Raman lines or more specifically lines on the low frequency side are known as Stokes lines and on the high frequency side are known as anti-Stokes lines.

Raman effect was originally studied with dust free Benzene or toluene was also found with solids and gases.