HALF WAVEPLATE :-

A plate of doubly refraction crystal i.e. quartz or calcite whose refracting faces are cut parallel to the direction of optic axis and whose thickness is such to produce the path difference '$\frac{\lambda}{2}$' or phase difference 'π' between o-ray and e-ray respectively.

Let 't' be the thickness of half-wave plate and μ_o and μ_E be the refractive indices of o-ray and e-ray then for the negative crystal

Path difference = $(\mu_o - \mu_E)t$

∴ the path difference of half-wave plate is '$\frac{\lambda}{2}$'

Hence the above equation becomes

$$\frac{\lambda}{2} = (\mu_o - \mu_E)t$$

$$\boxed{t = \frac{\lambda}{2(\mu_o - \mu_E)}} \quad \text{---(1.)}$$

and for the positive crystal

$$\boxed{t = \frac{\lambda}{2(\mu_E - \mu_o)}} \quad \text{---(2.)}$$

The quarter and half wave plate are also called retardation plates because they retard the motion of one of the beams they are either made of quartz by cutting it parallel to the optic axis such that whose face parallel to the optic axis

• RESOLVING POWER :-

Defination :-

An optical instrument like a microscope and telescope is said to have resolved the two point ~~sources~~ sources in two images are distinguished from each other then such ability of the instrument is called resoming power of that instrument. Therefore, the resolving power of an optical instrument may be defined as below.

" The ability of an optical instrument to just resolve the images of two nearby point sources is called resolving power in other words. We can say that the resolving power of an optical instrument is defined as its ability to just resolve two close spectral lines. "