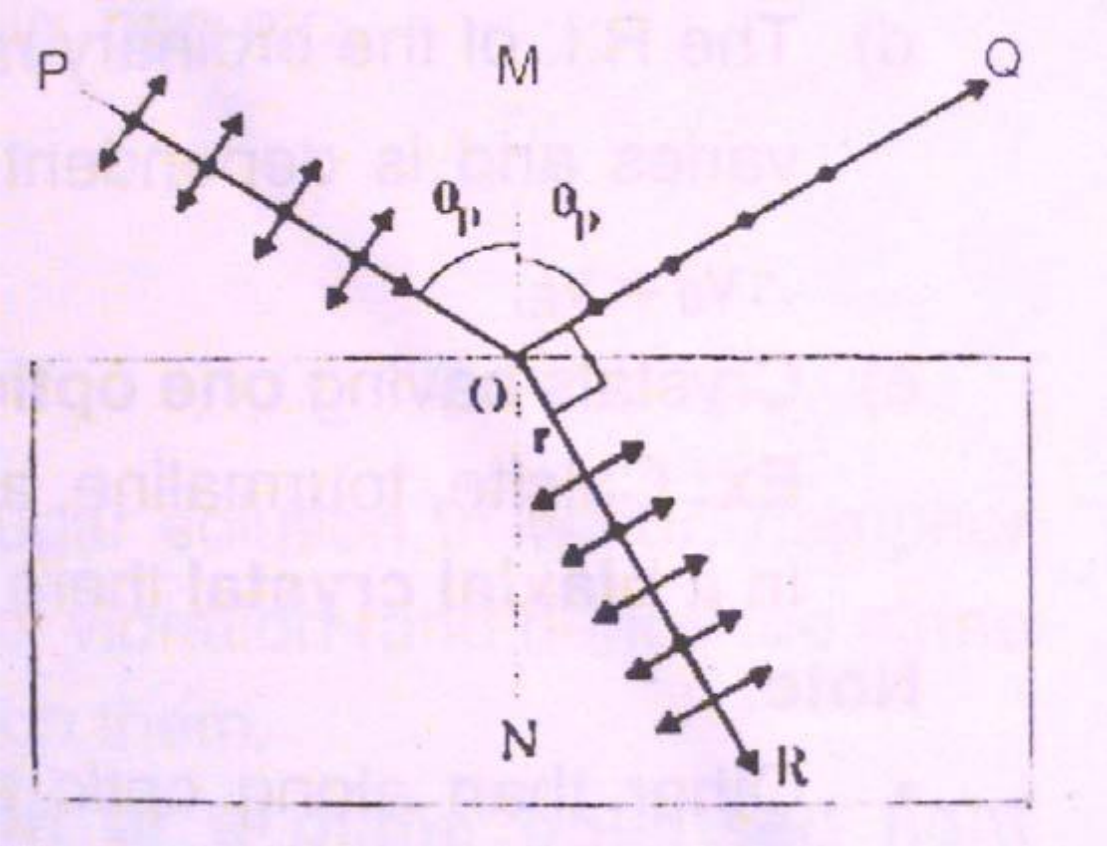
Polarization angle and Brewster's angle

Consider unpolarized light to be incident at an angle(Θ) on a dielectric like glass(PO),as shown in fig. below .there will always be a reflected ray (OQ) and a refracted ray OR .the reflected ray OQ is partially plane-polarized and that only at a certain definite angle. about 57^0 for ordinary glass .it was Brewster who first discovered that at this polarizing angle Θ the reflected and refracted rays are just 90^0,apart.



This remarkable discovery enables one to correlate polarization with the refractive index

where θ_1 is the angle of reflection (or incidence) and θ_2 is the angle of refraction.

Using Snell's law,

$$n_1 \sin(\theta_1) = n_2 \sin(\theta_2),$$

one can calculate the incident angle $\theta_1 = \theta_B$ at which no light is reflected:

$$n_1 \sin(\theta_B) = n_2 \sin(90^\circ - \theta_B) = n_2 \cos(\theta_B).$$

Solving for θ_B gives

$$\frac{\boldsymbol{sin}\theta}{\boldsymbol{cos}\theta} = n$$

$$\tan\theta = n$$ Brewster's law

this is Brewster's law:***The refractive index of the medium is equal to the tangent of the polarizing angle*** ,which shows that the angle of incidence for maximum polarization depends only on the refractive index.