

 :- Conditions for Maxima and Minima in Transmitted Light :-

The two rays BT_2 and DT_2 reinforce each other if

$$2\mu t \cos r = n\lambda \quad (\text{Condition of maxima}) \quad \text{--- (4)}$$

When $n = 1, 2, 3, \dots$

The film will therefore appear bright in the transmitted light.

Again the two rays will destroy each other, if

$$2\mu t \cos r = (2n+1)\frac{\lambda}{2} \quad (\text{Condition of minima}) \quad \text{--- (5)}$$

Where $n = 0, 1, 2, 3, \dots$ and the film will appear dark in the transmitted light.

A comparison of equation (2), (3), (4) and (5) shows the conditions for maxima and minima in reflected light are just reverse of those in transmitted light.

Hence the film which appears bright in the reflected light will appear dark in transmitted light and vice-versa.

Production of colours in thin film:

When a thin film is illuminated by monochromatic light and seen in reflected light, it appears bright or dark according to $2\mu t \cos r$ is $(2n+1)\frac{\lambda}{2}$ or $n\lambda$ respectively. If however, the film is exposed to an extended source of white light. It shows beautiful colours