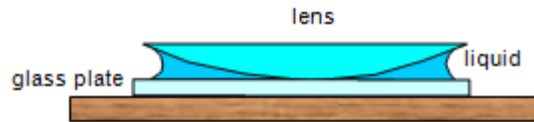


Answer on Question #47769, Engineering, Other

Newton's rings are observed with two different media between the glass surfaces. The n th rings have diameters as 10:7; Find the ratio of the refractive indices of the two media

Solution:

Newton's rings is a phenomenon in which an interference pattern is created by the reflection of light between two surfaces—a spherical surface and an adjacent flat surface.



For a dark ring viewed by reflection:

$$n\lambda = \frac{\mu r_n^2}{R}$$

where $n = 0, 1, 2, 3$, etc, r_n is the radius of the n th ring and μ is refractive index.

Thus,

$$r_n = \sqrt{\frac{n\lambda R}{\mu}}$$

In our case,

$$\frac{r_{n1}}{r_{n2}} = \sqrt{\frac{\mu_2}{\mu_1}} = \frac{10}{7}$$

Thus,

$$\frac{\mu_2}{\mu_1} = \frac{100}{49}$$

$$\frac{\mu_1}{\mu_2} = \frac{49}{100} = 0.49$$

Answer: $\frac{\mu_1}{\mu_2} = \frac{49}{100} = 0.49$