Q- Red light (n = 1.520) and violet light (n = 1.538) traveling in air are incident on a slab of crown glass. Both colors emerge from the glass at the same angle of refraction. The red light has an angle of incidence of 35.96°. What is the angle of incidence of the violet light? Give your answer to four significant figures.

Solution:

According to Snell's law

$n = \sin i / \sin r$

For red light

$1.520 = \sin 35.960 / \sin r$

For violet light

$1.538 = \sin i / \sin r$

Dividing the two equations

$\sin i = (1.538/1.520) \sin 35.960 = 0.5942$

Gives $i = \sin^{-1}(0.5942)$

$= 36.46^0$.