

Refraction of Light

Index of Refraction: $n = \frac{c}{v}$ ($c = 3.00 \times 10^8 \text{ m/s}$)

$$n = \frac{\sin \theta_i}{\sin \theta_r} \quad (\text{only if incident in air/vacuum})$$

Snell's Law: $n_i \sin \theta_i = n_r \sin \theta_r$

MP/399

$$n_i = 1.00$$

$$\theta_i = 65.0^\circ$$

$$n_r = ?$$

$$\theta_r = 42.0^\circ$$

air \rightarrow unk. liquid

$$n_i \sin \theta_i = n_r \sin \theta_r$$

$$(1.00)(\sin 65.0^\circ) = n_r (\sin 42.0^\circ)$$

$$n_r = \frac{(1.00)(\sin 65.0^\circ)}{\sin 42.0^\circ}$$

$$n_r = 1.35 \quad \leftarrow \text{index of refraction of the unk. liq.}$$

MP/404

$$n_i = 1.00$$

$$\theta_i = 45^\circ$$

$$n_r = 1.54$$

$$\theta_r = ?$$

air \rightarrow ruby

$$n_i \sin \theta_i = n_r \sin \theta_r$$

$$(1.00)(\sin 45^\circ) = (1.54) \sin \theta_r$$

$$\sin \theta_r = \frac{(1.00)(\sin 45^\circ)}{1.54}$$

$$\sin \theta_r = 0.459 \dots$$

$$\theta_r = \sin^{-1}(0.459 \dots)$$

$$\theta_r = 27^\circ$$

TO DO

PP/400 + PP/404

Assignment: p444/40-43, 49-54, 56-62

ADN: 52+58