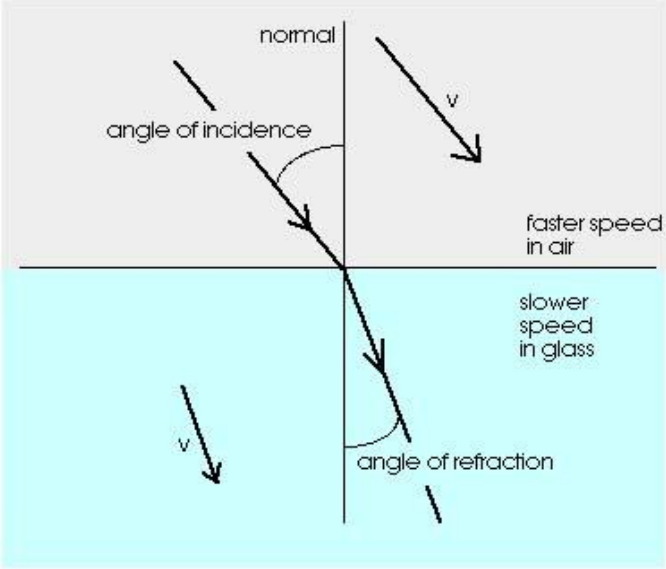
Answer on Question #52421, Physics, Optics

A ray of light travels from air to glass. The incident ray makes an angle of 45 degrees while the refracted ray makes and angle of 30 degrees with the normal to the interface. The speed of light in air is 3.0×10^8m/s. What is the of speed of light in glass?

Solution:



The index of refraction is of glass is

$$n = \frac{c}{v}$$

where c speed of light in air.

The refraction law give

$$\frac{\sin 45°}{\sin 30°} = \frac{n}{1} = \frac{c}{v}$$

$$v = c\frac{\sin 30°}{\sin 45°} = 3 * 10^8 * \frac{\sin 30°}{\sin 45°} = 2.121 * 10^8 \text{ m/s}$$

Answer: $2.121 * 10^8$ m/s.

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