Lab #8

The Index of Refraction of Glass

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3/30/2016

Purpose

To determine the index of refraction of a glass sample.

Theory

Index of Refraction:

1) Speed of light in a vacuum divided by the speed of light in a medium.

Materials

1) Paper
2) Glass square
3) Protractor
4) Ruler

Procedure

1) Trace the glass square.
2) Draw a (non-perpendicular) line that meets a square.
3) Look at where the line would appear to come out from the square and draw a line parallel to the original line at that point.
4) Connect the points where each of the lines meet the square.
5) Determine the angle of incidence of the exterior line to the square.
6) Determine the angle of refraction.
7) Divide the sin of the exterior angle by the sin of the angle of refraction.

Diagrams
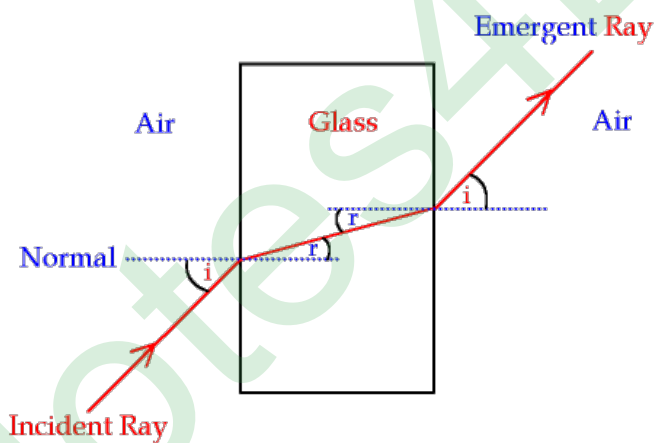
Data

Exterior angle of incidence (i): 48°

Angle of Refraction (r): 39°

Index of Refraction: $\frac{\sin (48)}{\sin (39)}$=1.181

Known Index of Refraction: 1.52

Percent Error: $\frac{1.52-1.181}{1.52}$=22.3%

Conclusions and Discussion of Result

We determined the index of refraction of a glass sample by dividing the angle of incidence of a ray to the glass sample by the angle of refraction.