

Date 16/9/19.....

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Expt. No. 7

Integrated Optics - Refractive IndexApparatus

Spectrometer, spirit level, magnifying glass, glass prism, Sodium vapour lamp.

SLO/Aim: To determine the refractive index of the glass prism using a spectrometer.

Formula:

$$\mu = \frac{\sin\left(\frac{A + \delta_m}{2}\right)}{\sin\left(\frac{A}{2}\right)} \quad (\text{No units})$$

μ = Refractive index of glass prism,
 A = Angle of prism.
 δ_m = Angle of min. deviation

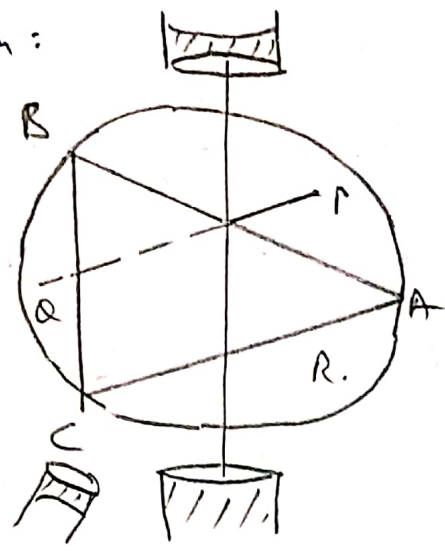
Result:

The refractive index (at 589.3nm) of the given glass prism is 1.5345 (unitless)

Teacher's Signature :

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Ray diagram :



Diffract of angle of min. deviation

Tabulation :

Least count 1°

Angle of Prism, A (as obtained earlier) = 60°

Vernier	Reading of min. deviation (R ₁)			Reading for direct ray (R ₂)			S _m = R ₁ - R ₂	M
	MSR (degree)	VS (min)	TR (degree)	MSR (degree)	VS (min)	TR (degree)		
A	199° 2'	8'	199° 33'	159° 59'	60'	199° 10'	40° 28'	1.534
B	199° 0'	5'	199° 55'	339° 0'	21'	339° 32'	40° 20'	1.534

$$\sin \left(\frac{60^\circ + 40^\circ 28'}{2} \right) = 1.534$$

$$\text{Mean} = \frac{1.534 + 1.534}{2} = 1.534$$

$$\sin \left(\frac{60^\circ + 40^\circ 20'}{2} \right) = 1.534$$