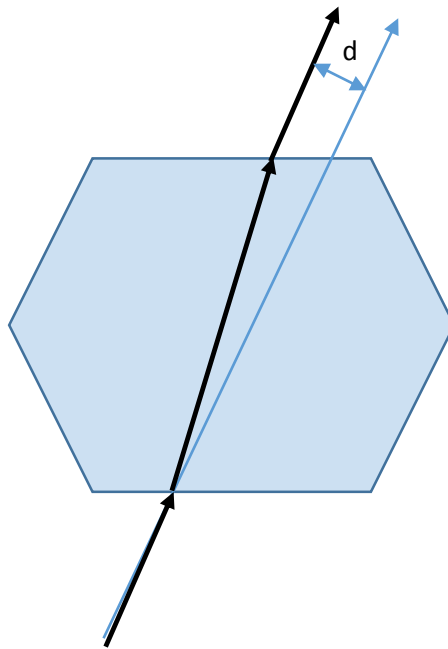


Experiment 8

Measuring index of refraction

A) Measuring the index of refraction from parallel shift

Using the provided hexagon samples, measure the shift of beam for three different angles and determine the refractive index of the material.



The distance between two parallel surfaces of the hexagon:	
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The angle between the surface normal and the incident light:	Deflection amount (d):

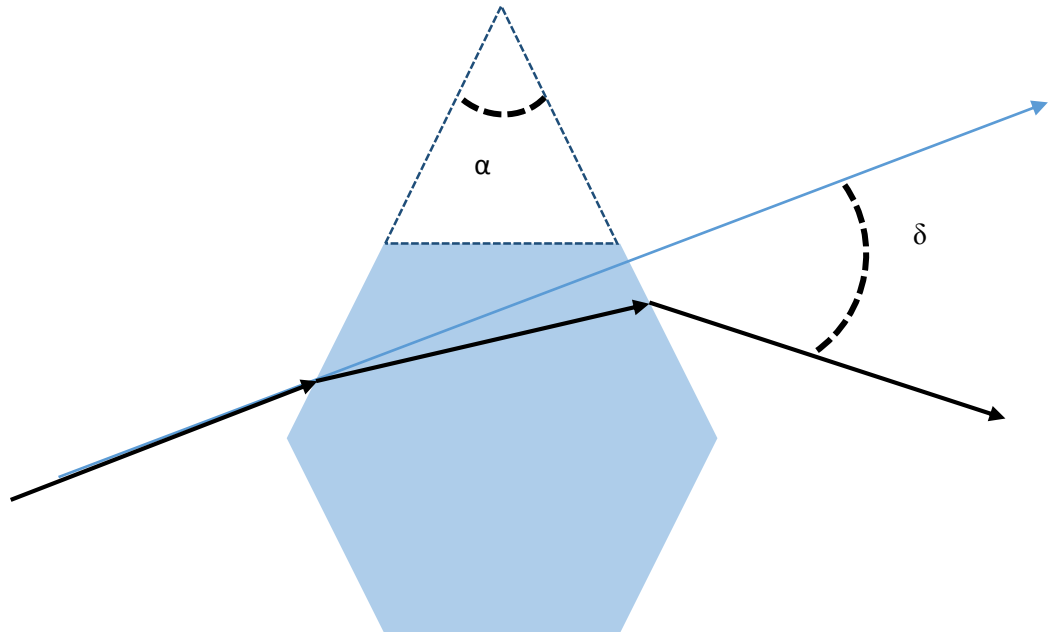
Calculated refractive index:	
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Your calculations:

B) Measuring index of refraction from the minimum deflection angle.

The hexagon structure can be thought as the piece cut from the equilateral prism. Let's define the δ as the deflection angle of the prism with apex angle α . The relationship between the minimum deflection angle, δ_{min} , and the refractive index is as follows:

$$n = \frac{\sin\left(\frac{\alpha + \delta_{min}}{2}\right)}{\sin\left(\frac{\alpha}{2}\right)}$$



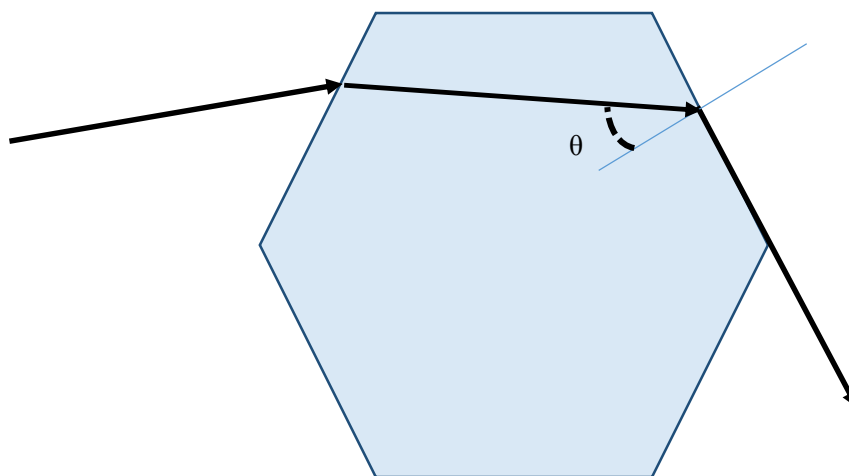
Measured deflection angle:	
Calculated refractive index:	

Your calculations:

C) Measuring the index of refraction with total internal reflection:

Total internal reflection is a phenomenon which occurs when a propagating wave strikes a medium boundary at an angle larger than a particular critical angle with respect to the normal to the surface. With the help of your setup measure the critical angle for total internal reflection and extract the refraction index.

Measured critical angle θ :	
Calculated index of refraction:	



Your calculations: