Index of Refraction Lab Report

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1 Introduction

In the Index of Refrflipping action Lab, we were missioned to measure the index of refraction of a glycol box and the critical angle for a laser moving into a water container, using provided materials.

2 Experimental Setup

3 Data & Result

Yielded Data for Experiment 1

Angle of Incidence	Angle of Refraction
70°	42°
60°	38°
50°	32°
40°	28°
30°	20°
20°	16°
10°	8°

Table 1: Yielded data for experiment 1, including Angles of Refraction (θ_2) and Angles of Incidence (θ_1)

Yielded Data for Experiment 2

Critical Angle	51°
n of the Container	about 1.49

Table 2: Yielded data for experiment 2, where n is the refractive index of the container

3.1 Sample Calculation

To calculate the index of refraction, we apply Snell's law:

$$n_1 \sin \theta_1 = n_2 \sin \theta_2, \qquad \text{(Snell's Law)}$$

$$n_2 = \frac{n_1 \sin \theta_1}{\sin \theta_2}. \qquad (1)$$

Take row $\theta_1 = 50°, \theta_2 = 32°$ as an example:

$$n_2 = \frac{n_1 \sin \theta_1}{\sin \theta_2}$$
$$= \frac{1 \times \sin 50°}{\sin 32°}$$
$$\approx 1.45$$

4 Discussion Questions

4.1 Do we need to consider the central medium when calculating the index of refraction?

4.2 Why doesn't the critical angle match up with our expectation. Should it?

4.3 2015 AP® Physics 2 FRQ #1

a.

b.

c.