

## **Refractive index of water by real and apparent depth using a traveling microscope**

Purpose:

To measure the refractive index of water.

Apparatus:

1. Traveling microscope
2. Slap of glass.
3. object like paper that had written with(x).

Experimental Details:

1. Place the paper that had written(x).
2. Be careful, adjust the cross-hairs of the microscope so that you can be clearly seen without strain.
3. Place the microscope vertically above the object (x) and adjust the height of the instrument until the object (x) is in sharp focus with no parallax between their image and the cross- hair, Read the vertical vernier scale of the microscope and record the reading, this reading is(d1)
4. Place the water vertically above the object(x) and adjust the height of the instrument until the object(x) is in sharp focus with no parallax between their image and the cross-hair, Read the vertical vernier scale of the microscope and record the reading, this reading is(d2)
5. Place the object (x) above the water and place the microscope vertically above the object(x) adjust the height of the instrument until the object(x) is in sharp focus with no parallax between their image and the cross-hair. Read the vertical vernier scale of the microscope and record the reading, this reading is(d3).

### **Readings & Results:**

For first attempt find  $n_1$ , for second attempt find  $n_2$ , for third attempt find  $n_3$ , then find the average of  $n$ . Find the percentage of error of  $n$  compare with the real value of refractive index of glass that equal to ( $n = 1.33$ ) Use this table below to write your reading.

$d_1/\text{mm}$	$d_2/\text{mm}$	$d_3/\text{mm}$	$d_3-d_1$	$d_3-d_2$	$n = (d_3-d_1 / d_3-d_2)$
Average of $n = (n_1+n_2+n_3) / 3$					

Discussion:

Q1. What is the relation between the material like(glass) and the refractive index, is refractive index constant for all types of water? why?

Q2. What is the minim value of refractive index?

Q3. What is Snell's law?

Q4. What is the difference between the refractive and reflective

Q5. Is there another method to find  $n$ ? Write it?

Q6. Is the refractive index for many liquids is constant? why