1/8/16 TRAVELLING MICROSCOPE Exp-3

AIM:

To determine the refractive index of the given transparent liquid using travelling microscope

APPARATUS REQUIED:

Travelling microscope, transparent liquid (water), Reading lens, Glass beaker, pin, Sawdust

FORMULA:

The refractive index of liquid (μ)

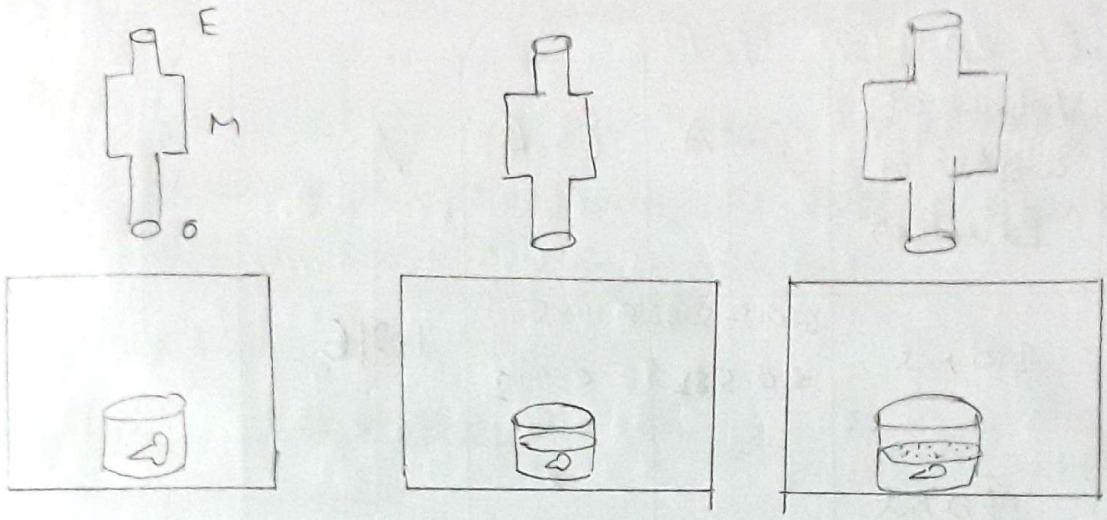
$$\mu = \frac{\text{Real depth of the liquid}}{\text{Apparent depth of the liquid}} = \frac{(C-A)}{(C-B)}$$

where

A is the microscopic reading when tip of the pin is focused directly

B is the microscopic reading when tip of the pin is focused through the liquid

C is the microscopic reading when saw dust sprinkled on the surface of the liquid is focused.



OBSERVATION TABLE:

Least count of Travelling microscope

$LC = 1MSR - 1VSR$

$1MSR = 0.05\ cm$

$50\ VSR = 49\ MSR$

$1VSR = \frac{49}{50} MSR$

$LC = 1MSR - \frac{49}{50} MSR$

$= \left(\frac{1}{50} \times 0.05\right) cm = 0.001\ cm$

Volume (ml)	clear image of tip of the pin (Reading A)			clear image of tip of the pin seen through the liquid (Reading B)			clear image of the saw dust scattered on the surface of liquid. (Reading C)		
	MSR (mm)	VSR (mm)	TR (mm)	MSR (mm)	VSR (mm)	TR (mm)	MSR (mm)	VSR (mm)	TR (mm)
20 ml	4.6	0.010	4.610	5.7	26 × 0.001 = 0.026	5.726	6.2	15 × 0.001 = 0.015	6.215
40 ml	~~4.25~~	0.003	~~4.260~~ 7.263	7.40	0.003	7.403	7.8	0.045	7.845
60 ml	~~4.25~~	0.013	~~4.610~~ 7.263	7.95	0.001	7.951	10.25	0.025	10.375

Volume of water in Breaker	C - A	C - B	μ
20 ml	6.018 - 5.462 = 0.558	5.911 - 5.462 = 0.449	1.246
40 ml			
60 ml	10.35 - 7.45 = 2.90	10.35 - 7.95 = 2.40	1.288

= 3.112

Mean : 1.302

Soft Drink :-

Volume of soft drink in Breaker	(A)			(B)			(C)		
	MSR (mm)	VSR (mm)	TSR (mm)	MSR (mm)	VSR (mm)	TSR (mm)	MSR (mm)	VSR (mm)	TSR (mm)
20 ml	6.35	9	6.369	6.65	9	6.659	7.4	9	7.409
60 ml	6.35	9	6.359	7.3	2	7.302	9.35	3	9.353

Volume of soft drink	C - A	C - B	μ
20	1.05	0.750	1.4
60	2.994	2.053	1.43

Mean : 1.41

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