ASSIGNMENT-9 EXPERIMENT-9

DETERMINATION OF WAVELENGTH OF MONOCHROMATIC LIGHT NEWTON'S RING

AIM: To determine the wavelength of monochromatic light using Newton's ring method.

APPARATUS: Travelling microscope, glass plate, convex lens, monochromatic light.

FORMULA:

$$\lambda = r_{n+m}^{2} - r_{n}^{2}/mR \quad \text{meter}$$
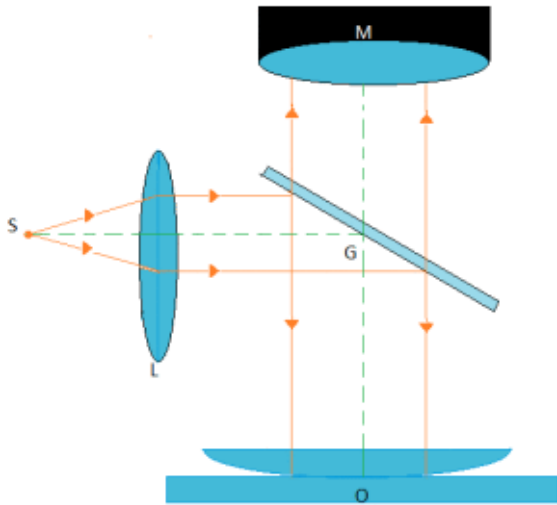

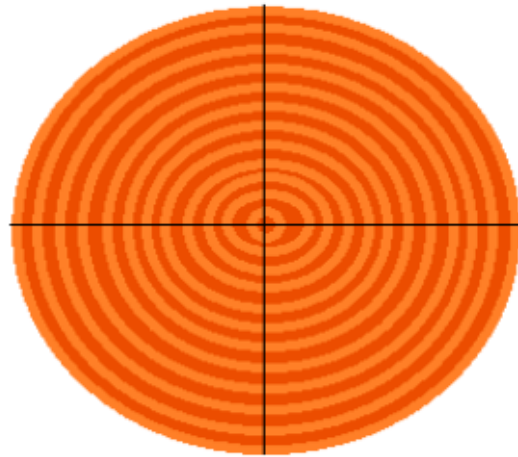Fig. 9.1. Newton's Ring Set up   Fig. 9.2. Newton's Rings

Order of the Ring	Microscope Reading		Diameter of the Ring cm	Radius of the Ring cm	r^2 $\times 10^{-4}$ cm^2	$r_{n+12}^2 - r_n^2$ cm^2	λ (Å)
	Left	Right					
N	5.652	5.755	?	?	?		
N+3	5.605	5.807	?	?	?		
N+6	5.554	5.851	?	?	?		
N+9	5.509	5.903	?	?	?		
N+12	5.455	5.955	?	?	?	?	?
N+15	5.408	5.996	?	?	?	?	
N+18	5.398	6.045	?	?	?	?	
N+21	5.353	6.003	?	?	?	?	
					Mean	?	

OBSERVATIONS

Radius of curvature of the given lens R = 1m

Order of the ring m = 12

Assignment Question:

1. From the microscope readings (Left and Right), find out the difference between these two readings and enter the same in the tabular coloum as diameter of the ring.

2. From the diameter of the ring find out the radius of the ring & square of radius and enter the same in the respective coloums in four decimal points.

3. From square of radius calculate the difference between order of the rings, N & N+12, N+3 & N+15, N+6 & N+18, N+9 & N+21. Let it assume $r_{n+12}^2 - r_n^2$. Also calculate its mean value.

4. From the mean value of $r_{n+12}{}^2 - r_n{}^2$, order of the ring (m) and Radius of curvature of the ring (R), calculate the wave length of the monochromatic ring by using the formula.

5. Write the result in the following order

Wave length of the monochromatic light = ………..Å

Finally, submit the scanned copy of your observation note book in GCR on (or) before THREE working days from the date of experiment.