

WAVELENGTH OF WHITE LIGHT

SPECTROMETER

AIM: (i) To determine the number of lines per milimeter of the grating using the green line of the mercury specterum.

(ii) To calculate the wavelength of other prominent lines of mercury by normal incidence method.

APPARATUS: Spectrometer, diffraction grating element and

THEORY: When a wave train strikes on an obstacle the say light gray will bend at the corners and edges of it, which causes the spreading of light waves into the geometrical shadow

of a obstacle. This phenomenon is turned as diffraction.

Single Slit Diffraction:

When warre pars through a gap, which is about as wide as the wavelength they spread out into the origion beyond the gap.

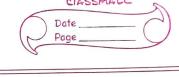
Mygen's considered each point along a wave front to be of a secondary disturbance that forms a semi-circular wavelet.

Dilhaction is due to the superposition of such secondary way

Diffraction is due to the superposition of such secondary waxelosts. This suandary wavelets spread out and overlap each other interjuing with each other to form a pattern of maximum and minimum intensity. The pattern formed on a screen consists of a broad central band of light with dark boards on either ixele

The darks bands are could when the light from the top part of the slit distructively interperes with the bottom half.

HT AM SLAVA. wavefront add as sounces of new cincular waveforts comal out. a le pricop notice fite, intrancingà .: 20 1 1 1 1 1 1 1 1 1 Consider a slit of width 'a'. Let at an angle of the path difference between he top and bottom of the slit is a wavelength. This causes distructive interference to occur to because he part difference between the two tours is of At this angle from top is getting cancelled by bottom hay. The phenomeron is minuted as difference As = asino Intensity minima as will occur if this path length difference is an integral number of wavelength, at sin 00 = n) a order of each minima wave length with and religion with a result to the area of the disposition with the second of the sample of angle of which des trumpte as yours the temps time girtleyens a secury who are to provide a part on a provide Intensity wie given by the of water according I = Is smil(NS) so and whom we arrive a state phase angle.



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	$S = \frac{2\pi \alpha^* \sin(\theta)}{\lambda}$
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h	Diffraction grating is an optical components having a periodic.
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PROCEDURE: Component of the simulator: Telescope Caliberate elider: helps user to change to aus of telescopes drangemen hair. I be to give moderated Start McRuffon Hill have The light toggle button: helps user to switch on or OFF lamp Grating toggle button: pulps user to place or sumore the grating Telescope angle slider: used to change telescope angle Venier angle slider: used to change angles of Kurnenscole Caliberating Tellscope button: helps to recaliberate he telescope if needed much sois broadure for smulatori-To standerable the grating: Turn on the telescope to obtain my image of the stit. Turn by telescope to born side to obtain green ling Note the mading of both the runiers Colculate me difference in moding to obtain me diffrection congle. Then from the equation, number of lines por unt length can be calculated To calculate the warrelength of different lines: Obtain the direct image Telescope is moved to make the cross wire cornide with each line of the spectrum

Note the reading & colculate diffraction angle

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	TABULATION: FIRST & HARV od A											
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