Reet Sharma 106030 **Performed On 04/01/2022**

Experiment 2: Diffraction grating

AIM: To measure the wavelengths of spectral lines of a Mercury (Hg) source using diffraction grating and a Spectrometer.

APPARATUS: 1.Diffraction grating
2.Spectrometer
3.Mercury source(Hg)
4.Spirit level
5.Reading lamp and reading lens

OBSERVATIONS:

Table (2.1) Observations, Calculation and Results

d = grating element = $d = \frac{2.54*10^8}{N}$ Å = $\frac{2.54*10^8}{15000}$ Å = 16933.333 Å

m = order of spectrum = 1

Sr. No.	Spectral Line	Angular Positions		2θ (deg.min.)	Angle of Diffraction θ (deg.min.)	Experimental wavelength $\lambda_e(A^o)$	Standard Wavelength $\lambda_s(A^o)$	% deviation %
		Left,θ1 (deg.min.)	Right,θ2 (deg.min.)					
1.	Blue	198°	165.25°	32.75	16.375	4773.50	4720	1.133%
2.	Violet	138.10°	170.05°	32.16	16.8	4705.32	4387	7.255%
3.	Cyan	167°	203°	35	17.5	5079	5000	1.5998 %
4.	Green	135.21°	176.06°	39.44	19.5	5754.49	5400	5.393%
5.	Yellow	160.5°	202°	41.5	20.75	5994.38	5800	3.35%

RESULT

1. The percent deviation of Blue is **1.133%**
2. The percent deviation of Violet is **7.255%**
3. The percent deviation of Cyan is **1.5998%**
4. The percent deviation of Green is **5.393%**
5. The percent deviation of Yellow is **3.35%**

My Understanding Of the Experiment:

In this experiment, we have understood that when light waves overlap they create interference and patterns caused by this can be used to determine the wavelength of light. By using closely spaced slits, the light is diffracted to large angles so, by doing this we can get more accurate measurement.