Edward Heeney Molecular Spectroscopy Lab report

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1 Abstract

2 Results

2.1 Experiment 1

Mercury Discharge Lamp Emission Spectrum
An increase in integration time led to increased peak magnitude, and a decrease in integration time led to a decrease inpeak magnitude. An increase in the average (number of scans over which to average) was found to reduce minor fluctuations of the graph. An increase in boxcar width reduced accuracy of the graph and increased smoothness of the graph. Selecting "correct for electrical dark" brought the minimum of the graph to zero, whereas before it was found to be approximately 5 thousand counts. The Count before saturation is reached was found to be 58,290.65. The saturation occurs due to the use of an ADC(analogue to digital converter), which has a bit limit.. This happens when the power level of the input is too high. When the lamp was moved further away from the fiber, the magnitude of the peaks reduced, however the overall shape of the graph did not change.
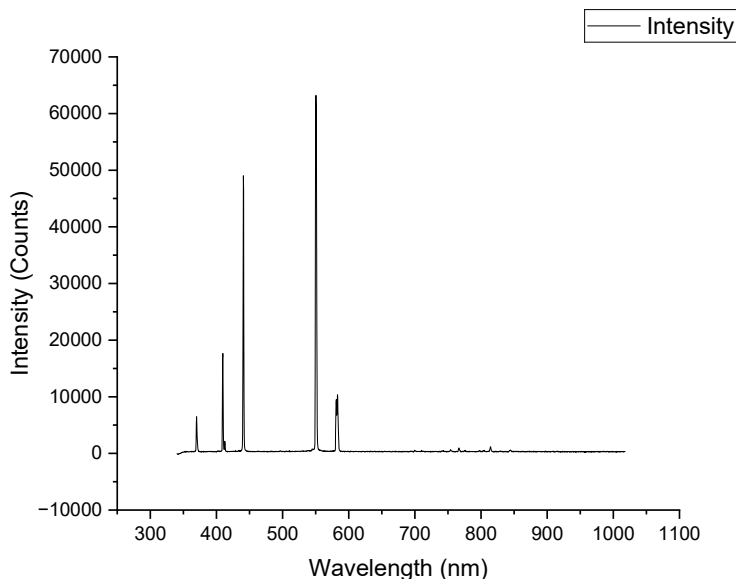

Figure 1: *Mercury Lamp Emission Spectrum Measured by Flame S*

The wavelegths of the largest 5 peaks was found to be (in order of left to right): 370.21nm(FWHM:2.756), 410.837(FWHM: 2.97), 440.626(FWHM:2.982), 550.282(FWHM4.275), 583.259(FWHM:3.1)
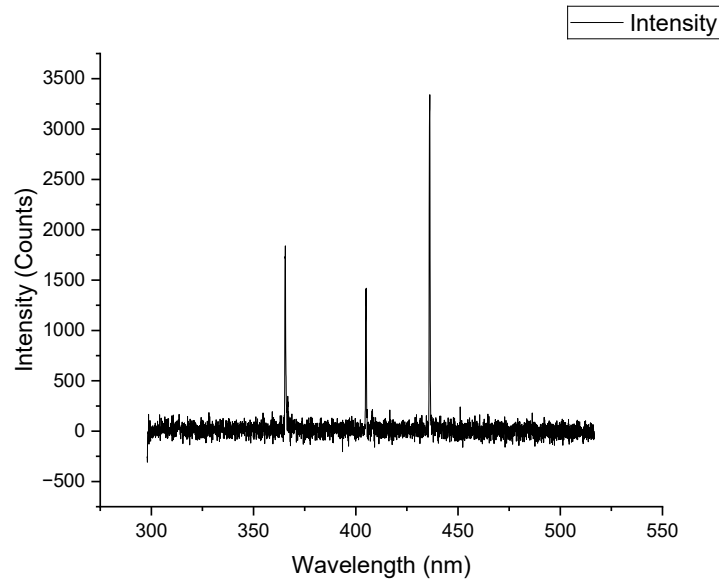

Figure 2: *Mercury Lamp Emission Spectrum Measured by Flame T*
The three largest peaks of this graph were found to have wavelengths (from left to right):
365.604(FWHM:0.565), 405.115(FWHM:0.509), 436.19(FWHM:0.489)

Rayleigh Criterion

2.2 Emission Spectrum of N_2

3 Conclusion