Compare your grotrian diagram to Hydrogen - what do you notice (hint look at what happens for different values of L for the same n)

When comparing the experimentally calculated Grotrian for sodium with that of hydrogens, it becomes apparent that unlike hydrogen, the energies of the s, p and d angular momentums differ even for constant principle quantum numbers. This outcome was predicted prior to the experiment, such that the lower orbital electrons cause a change in potential from the coulomb potential found for hydrogen. This explained the constant energy over varying angular momentums displayed in hydrogens Grotrian, such that the constant coulomb potential resulted in no change in energy level values. To quantise the shift found in the sodium Grotrian, it was found that a downshift to n of ($-1.2\pm0.4$), ($-0.6\pm0.2$) and ($-2\pm1$) for s, p and d respectively would account for such a shift.

Explain why L matters for sodium and not for hydrogen.

This is a clear result of

Explain why the sodium lamp does what it does. <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/pressure-broadening> is a great source!! (Hint, it is related to collision frequency and heisenbergs uncertainty principle). Also talk about any colour differences you see in the 2 'yellow' lines for the high pressure. Also investigate other reasons for what you see. This should be a very brief section but is still necessary.

RELIABILITY/VALIDITY:

Have a section where you evaluate all approximations you made and whether they were reasonable or had an effect on your results. (e.g. I found that 8d and 9s were above 0eV which is wrong but it was due to the assumptions I made creating error). This is really important, you should link this to your experimental method, are the decisions you made valid in light of your results and did you estimate your uncertainties well enough?

A circular object with a light in the middle

Description automatically generatedA rainbow colored circle with lines in the middle

Description automatically generatedA circular object with a rainbow colored light

Description automatically generated with medium confidence