



What are stars and planets made of? Teacher Notes

This is a very exciting lab! Materials include a power supply, 5 spectrometers and 11 tubes; hydrogen, iodine, air, mercury, argon, neon, xenon, oxygen, carbon dioxide, water, and krypton. (Unfortunately, helium and nitrogen were out of stock.) To prepare for the experiment please do the following:

- 1) View DVD, Atomic Spectra
- 2) Look over product pamphlet for tubes
- 3) Look over product pamphlet for the spectrometers
- 4) Read the student's instructions.

In the demonstration you first put in some of the gases for which there are spectra in the book and have the students identify them. You then proceed to insert other gases. You now tell the student what the gas is and have the students draw the lines. The equipment can be used for many other experiments. It also gives the students the opportunity for a more advanced learning experience that they should be able to relate to and enjoy.

A few notes:

- 1) When inserting the tubes, start from the bottom and push down firmly. Then insert the top. This seems to work better than the other way around. Best to handle the tubes with a clean cloth. Also, try not to leave them on too long. If the tubes heat up, it will contaminate the spectrum. In the instructions they say 30 seconds on and 30 seconds off. Not sure how practical this is, but you should be mindful of this and do your best.
- 2) When using the spectrometer, it is easy to confuse stray reflections for the spectrum. To see the spectrum you will need to point the spectrometer at the light source and then look at the scale. Make sure you are able to distinguish between the spectrum (on scale) and reflections to the left side. When you start working with the students, make sure they understand this before starting the lab. Once you know what to look for, this is not an issue. Another tip – you can cover the left opening of the spectrometer. This will significantly cut down the reflections and you will be able to see the lines well. However, the scale is not visible and you will have to take off your hand to see it. However, once you know what you're looking for, you will be able to see the spectral lines.