

Using the Spectrometer

Name _____

Per. _____ Date _____

First use the spectroscope.

1. Observe white light through the spectroscope. Describe what you see.
2. Observe fluorescent light with the spectroscope. Describe what you see.

Use the spectrometer. Aim the slit at the light bulb and look straight ahead or a little to the left of the scale. The various colors are described by wavelength in nanometers (nm) or by the energy of the particle of light, a photon, expressed in electron volts = Volts (eV) = 1.6022×10^{-19} joule.

3. Observe white light through the spectrometer. Read the number on the scale corresponding to the light farthest to the left that you can see and the number corresponding to the light farthest to the right.
 - a. The observed spectrum extends from _____ nm to _____ nm.
 - b. The colors at these places on the scale are _____ and _____.
 - c. Diagram your observation below.



4. Observe a fluorescent light through the spectrometer. Is it different from white light? Explain what you see.
 - a. The colored spectrum extends from _____ nm to _____ nm.
 - b. The spectrum you see includes vertical lines that are images of the slit. Indicate the position of these lines on the scale below.



5. Observe and diagram several other light sources. Label each diagram with the light source.





Critical Thinking

1. What is the gas found in fluorescent light bulbs? Support your conclusion with your observations of the line spectra produced by the spectrum tube gases.

2. In this investigation, you analyzed brightly colored line spectra. Could you still successfully complete this investigation if you were color-blind? Explain.

3. Why do you think that some of the reference lines given for the various gases you observed were not visible to you?

4. Helium was discovered in the Sun's corona during the eclipse of 1868. In 1888, traces of helium were isolated on Earth. Discuss how scientists could tell this was the same gas that had been identified in the Sun's corona.

5. How might film or electronic light sensors, such as those in video cameras enhance spectroscopy data?

6. How are grow lights used for rapid plant growth?

7. Which of the light samples you observed were continuous and which were discontinuous? What is the difference between the two types of light?

8. Why is it important to use red light in dark rooms when developing film?