

LAB: EMISSION SPECTRA OF ELEMENTS

Elements can be identified because each has a unique pattern of lines in its light spectrum. In this experiment you will use a spectroscope to observe the light given off by various elements.

MATERIALS

1 spectrometer

Colored pencils

Element discharge tubes and power source

PROCEDURE

1. Look at **fluorescent light** from the discharge tube. Record the color of the light.
2. View the light from the **fluorescent light** discharge tube through diffraction grating. Use color pencils to draw the vertical emission spectrum lines at the approximate positions where you see them on the scale below.
3. Repeat this process with light from the discharge tubes of different elements.

OBSERVATIONS

1. Fluorescent light

Color of light: _____

V	I	B	G	Y	O	R

2. Element: _____

Color of light: _____

V	I	B	G	Y	O	R

3. Element: _____

Color of light: _____

V	I	B	G	Y	O	R

4. Element: _____

Color of light: _____

V	I	B	G	Y	O	R

5. Element: _____

Color of light: _____

V	I	B	G	Y	O	R

6. Element: _____

Color of light: _____

V	I	B	G	Y	O	R

7. Element: _____

Color of light: _____

V	I	B	G	Y	O	R

ANALYSIS

1. How are electrons "excited" in this part of the lab? What happens when the electrons fall to the ground state?
2. What do the different colors in a line spectrum represent? Why are the spectra for each element unique?
3. Each element has its own unique line emission spectrum, just like fingerprints. Explain how this technique can be used to determine the elemental composition of stars.
4. What gas do you think is found in the fluorescent light bulb? Refer back to your results from the Spectroscopy Lab, Part 2. Explain your reasoning.
5. Look closely at the spectrum below. The last spectrum is a mixture of which two or more elements?

