

**Title of Lab:** Spectroscopy Virtual Lab*(From: GVL)***Purpose(s) of Lab:** Learn how flame tests and emission line spectroscopy can be used to identify unknown elements when compared to known elements.**Materials:** <http://www.trschools.com/staff/g/cgirtain/Weblabs/spectrolab.htm>**Procedure:**

1. Read the introduction and answer the following pre-lab questions.
  - a. Define spectroscopy.
  - b. Which color light has the shortest wavelength?
  - c. Which color light has the longest wavelength?
  - d. Compare and contrast the 3 types of spectra.
2. Follow the directions for the Flame test lab and record your data in the appropriate table below.
  - a. Click on each known metal ion and record the color of the flame.
  - b. Click on each unknown and record the color of the flame.
  - c. Based on your observations, identify the unknown metal ions.
3. View the emission line spectra for the provided elements and complete the appropriate table.
4. Answer the analysis questions.

**Data:**

## Flame Tests

Part 1 —Known elements flame tests		Part 2 —Unknowns	
ELEMENT	FLAME COLOR	UNKNOWN FLAME COLOR	ELEMENT
Barium		1	
Calcium		2	
Sodium			
Rubidium			
Potassium			
Lithium			

## Emission spectra

Element with greatest number of clearly visible emission lines (Na, Ne, Hg, He)	
Longest wavelength in the Continuous spectrum (in nanometers)	
Color of light for the longest wavelength	
Element with the fewest number of clearly visible emission lines (Na, Ne, Hg, He)	

## Questions:

1. Why do flame tests produce different colors for different elements?
2. How do the emission spectra compare in terms of colors and line positions?
3. Are they identical?
4. What is similar?
5. What is different?