

Name: _____ Pd. _____ Date: _____

Flame Test Lab

Abstract: Explain how light is released in the form of color using the Bohr model.

Purpose

To observe the characteristic colors produced by certain metallic ions when vaporized in a flame; and to identify an unknown metallic ion by means of its flame test.

Materials & Equipment

- wooden splints
- Bunsen burner
- 7 different metals ions in solution
- waste beaker with water

Procedure

1. Fill a beaker two-thirds of the way with water to dispose of used wooden splints.
2. Set up Bunsen burner. Adjust the gas and oxygen flow to produce a hot blue flame.
3. Take a wooden split from the metal ion solution and insert into flame. Before the wooden splint begins to burn, record the color of the flame and the using the spectrometer record the wavelengths of the metal's visible atomic spectrum.
4. Place the used splint in the waste beaker for at least one minute before placing it back in the Solution.
5. Repeat steps 1 through 4 for all 6 ions in the different stations.
6. Obtain a splint from the unknown solution. Repeat steps 1 through 4.

Data

Table 1 – Observed Flame Colors & Visible Atomic Spectrum Wavelengths

Solution	Metal Ion	Formula Name	Flame Color
NaCl	Na ⁺¹	Sodium Chloride	
KCl	K ⁺¹	Potassium Chloride	
Cu(SO ₄)		Copper (II) Sulfate	
CaCl ₂	Ca ⁺²	Calcium Chloride	
SrCl ₂	Sr ⁺²	Strontium Chloride	
CuCl ₂	Cu ⁺²	Calcium Choride	
Unknown 1	—		
Unknown 2		

Data Analysis (no need to copy questions but answer in complete sentences)

1. Based on the flame color what could the unknown solutions be?
2. Why did the flame color change before the wooden splint began to burn?
3. Why did the different metal ion solutions produce different colored flames?
4. Define the following terms:
 - a. Ground state
 - b. Excited state

Discussion of Error- Discuss the effect of any sources of error for the data analyzed in this lab.

Conclusion- Using your own words write a conclusion. The conclusion has the following basic format and should be 7-10 sentences or more in paragraph form.

- a. Claim: Restate your hypothesis; was it correct or incorrect?
- b. Evidence: What evidence is there in your data to support or not support your hypothesis? This is very important, as it connects your results to the conclusion.
- c. Reasoning: How does your data support the scientific principle explored in this lab? This is a research section. Use your text as one reference and you will need one additional reference beyond the text and the notes.
- d. Connections to the Real World: Explain how your results are related to something in the real world or answer questions about this.
- e. Further Experiment: Give an idea for an experiment that tests this concept further. You may not describe the same experiment with different materials.

