

Name _____

Flame Test Lab

II. Purpose:

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

III. Procedure:

1. Obtain a microwell tray. Clean it.
2. In the microwell tray, fill separate wells with each of the following metal ion solutions: Ba^{2+} , Ca^{2+} , Cu^{2+} , K^{1+} , Li^{1+} , Na^{1+} , and Sr^{2+} . The solutions should be kept in alphabetical order. Be careful not to mix the solutions.
3. Obtain 5 Q-Tips. Break each evenly in the middle, creating 10 swabs of equal length.
4. Soak a clean swab in each solution. Then place the swab in the burner flame and watch for the color changes in the flame. Repeat this process until a good color is obtained. Record the color, being specific.
5. Test the remaining solutions until all seven have been tested and their specific colors have been recorded. Save these solutions for comparison in the next step.
6. Fill new wells with each of the three unknown solutions. Be very careful to keep the solutions separate and know which unknown is which. Test each of the unknowns with the same procedure as in step 3. Use the known solutions to determine the identity of the unknown solutions. Clean up your lab station, including proper disposal of the chemicals, rinsing your well plate, and being certain the gas is turned off.

IV. Data:

Flame Tests of Known Solutions:

<u>Metal Ion</u>	<u>Color</u>	<u>Metal Ion</u>	<u>Color</u>
Ba^{2+}		Li^{1+}	
Ca^{2+}		Na^{1+}	
Cu^{2+}		Sr^{2+}	
K^{1+}			

Flame Tests of Unknown Solutions:

Unknown	Color	Metal Ion
A		
B		
C		

VI. Conclusions:

In this lab, you used heat to excite electrons, causing them to release light. Explain what is happening within the atoms as they release photons of light. Include the terms excited state and ground state.

What do the flame test colors tell us about the changes the electrons are undergoing?

An electron experiences a fall from energy 6 to 1 (a long fall). Will this be a high or low energy photon? What will the wavelength of the released photon be? What will its color be?

An electron experiences a fall from energy 5 to 4 (a short fall). Will this be a high or low energy photon? What will the wavelength of the released photon be? What will its color be?
