Name: Period:

Flame Test Lab DATA

Objectives:

1. To observe the colors emitted by various metals when heated
2. To calculate the amount of energy emitted by certain wavelengths of different colors

SAFETY:

1. DO NOT MOVE ANY OF THE METAL SOLUTIONS FROM THE FRONT LAB STATION.
2. DO NOT MIX THE METAL SOLUTIONS WITH ONE ANOTHER.
3. DO NOT PLAY AT THE LAB STATIONS.
4. DO NOT BURN THE WOODEN SPLINTS, BUT RATHER BURN THE CHEMICAL.
5. BE CAREFUL WITH BUNSEN BURNER. LISTEN TO INSTRUCTOR FOR DIRECTIONS!

Procedure:

1. In this lab, the student will travel to the front lab station to obtain salt sample to be used in flame test.
2. ONE person front each group will come up to front lab station to pick up one wooden splint with specific salts coated. Make sure you take note of which salt you've picked up. PICK UP ONE SALT AT A TIME!
3. Once you have picked up one particular salt, go back to your lab station.
4. Light the Bunsen burner as instructed by your teacher.
5. Place the wooden splint with the coated salt into the flame of the Bunsen burner. BE CAREFUL not to catch the wooden splint on fire. Just burn the chemical NOT the wooden splint.
6. Blow out the flame from the wooden splint, RINSE THE WOODEN SPLINT WITH WATER, and then dispose of it.
7. Repeat steps 3-6 for the remaining salts that you still need to test.

I. Known elements (salts)

Once you have indicated the color for each particular salt, look up the wavelengths for the corresponding colors of the salt and record it on the table below.

Type of Salt	Observation/ flame color	Wavelength (in meters)
1)Li^{+1}	red	7.00×10^{-7} m
2)Na^{+1}	Orange	6.50×10^{-7} m
3) Ca^{+2}	Yellow red	6.20×10^{-7} m
4) Cu^{+2}	Green-blue	4.90×10^{-7} m
5) Ba^{+2}	Pale green	5.20×10^{-7} m

Once, you have burned all the required salts, determined both the color and wavelength, flip to the back of this worksheet to calculate the frequency and then the energy of each color.

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II. Calculations of each salt and its corresponding color.

Remember we can calculate energy based on the information that was observed. If we know wavelength and frequency we can calculate energy!

$c = \lambda v$ **$E = hv$** **$c = 3.00 \times 10^{8}$ m/s** **$h = 6.63 \times 10^{-34}$ J s**

1. Salt _____ Wavelength (in meters)_____
   a. First calculate the frequency (***v***) of the color of the salt using wavelength from above.
      $c = \lambda v$ **$c = 3.00 \times 10^{8}$ m/s**

   b. Now using, the frequency calculated in part a, calculate the energy (J) using the following:
      $E = hv$ **$h = 6.63 \times 10^{-34}$ J s**

2. Salt _____ Wavelength (in meters)_____
   a. First calculate the frequency (***v***) of the color of the salt using wavelength from above.
      $c = \lambda v$ **$c = 3.00 \times 10^{8}$ m/s**

   b. Now using, the frequency calculated in part a, calculate the energy (J) using the following:
      $E = hv$ **$h = 6.63 \times 10^{-34}$ J s**

3. Salt _____ Wavelength (in meters)_____
   a. First calculate the frequency (***v***) of the color of the salt using wavelength from above.
      $c = \lambda v$ **$c = 3.00 \times 10^{8}$ m/s**

   b. Now using, the frequency calculated in part a, calculate the energy (J) using the following:
      $E = hv$ **$h = 6.63 \times 10^{-34}$ J s**

4. Salt _____ Wavelength (in meters)_____
   a. First calculate the frequency (***v***) of the color of the salt using wavelength from above.
      $c = \lambda v$ **$c = 3.00 \times 10^{8}$ m/s**

   b. Now using, the frequency calculated in part a, calculate the energy (J) using the following:
      $E = hv$ **$h = 6.63 \times 10^{-34}$ J s**

5. Salt _____ Wavelength (in meters)_____
   a. First calculate the frequency (***v***) of the color of the salt using wavelength from above.
      $c = \lambda v$ **$c = 3.00 \times 10^{8}$ m/s**

   b. Now using, the frequency calculated in part a, calculate the energy (J) using the following:
      $E = hv$ **$h = 6.63 \times 10^{-34}$ J s**