

SCH 4C - Flame Testing Lab

Purpose: to strongly heat various compounds or elements in a Bunsen Burner flame in order to observe combined spectral colours and if possible individual lines from the line spectra.

Procedure:

1. Obtain a Nichrome wire inoculation loop and thoroughly heat it in an intense Bunsen burner flame. Make sure the inoculating loop becomes red hot. Continue heating until any bright flame resulting from the inoculating loop dies down. The purpose of this preheating is to remove any contaminants from the inoculation loop.
2. Obtain a sample from the front of the room or alternate location. Make note of the formula of the sample in the observation table. Reheat the inoculating loop and place the loop in the sample such that a small amount of the sample sticks to the loop.
3. Heat the sample in the hottest part of the flame. Pay close attention to the overall colour and record in the observation table. Repeat as many times as necessary. Next attempt to observe the same flame test using the spectra scope. If you are able to observe any spectra lines, verbally record the approximate number and colour of the more prominent lines.
4. Return your sample to the front of the room, obtain the next sample and repeat #3. Take care not to contaminate each sample.
5. Return all equipment etc.

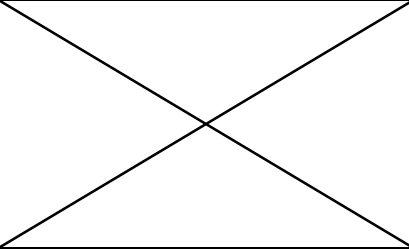
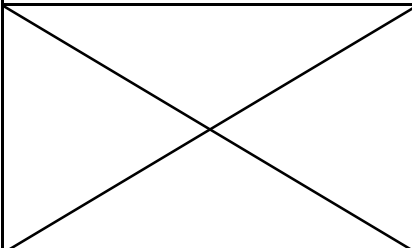
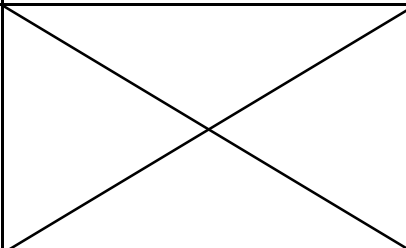
Concluding Questions:

1. Analyze your observation for the sodium, calcium and copper compounds. Compare the differences between the chloride, nitrate and sulphate compounds. Were there significant differences when chlorides, nitrates and sulphates were used? (For example, were there differences between NaCl, NaNO₃ and Na₂SO₄) If so what were the differences?
2. Compare all of the chloride compounds. Make a table (see example below) of the six metals that were tested here and the colours that were observed. Also report any significant spectral lines in the table.

	Observations
NaCl	
MgCl ₂	
KCl	
CaCl ₂	
CuCl ₂	
BaCl ₂	

3. What colour do strontium compounds produce? Were there any significant spectral lines?
4. Why was it necessary to thoroughly heat the inoculation loop between each test?
5. List the different types of electromagnetic radiation from most energetic to least energetic.
6. The line spectra for any given element has been called an elemental fingerprint. What does this mean? How has this fingerprint idea been put to good use.

SCH 4C Flame Testing Lab - Observation Table

NaCl	NaNO ₃	Na ₂ SO ₄
MgCl ₂		MgSO ₄
KCl	KNO ₃	K ₂ SO ₄
CaCl ₂	Ca (NO ₃) ₂	CaSO ₄
CuCl ₂	Cu (NO ₃) ₂	CuSO ₄
	Sr (NO ₃) ₂	
BaCl ₂	Ba (NO ₃) ₂	