Name _____

Date _____ Period _____

Flame Tests

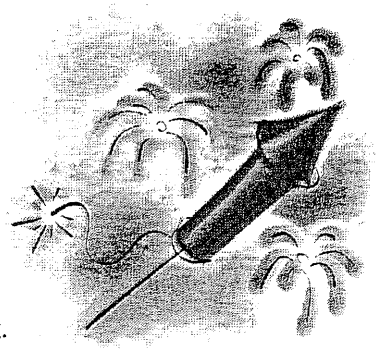
Fireworks produce fantastic combinations of color when they are ignited. The different colors are the results of burning different compounds. Imagine that you are the head chemist for a fireworks company. The label has fallen off one box, and you must identify the unknown compound inside so that the fireworks may be used in the correct fireworks display. To identify the compound, you will use your knowledge that every compound has a unique set of properties.

OBJECTIVE

Observe flame colors emitted by various compounds.
Determine the composition of an unknown compound.

MATERIALS

- Bunsen burner
- chloride test solutions (4) + unknown (1)
- hydrochloric acid, dilute, in a small beaker
- matches
- tape, masking
- test tubes, small (5)
- test-tube rack
- water, distilled, in a small beaker
- wire and holder



SAFETY INFORMATION

ASK A QUESTION

How can you identify an unknown compound by heating it in a flame?

FORM A HYPOTHESIS

Write a hypothesis that is a possible answer to the question above. Explain your reasoning.

PROCEDURE

1. Arrange the test tubes in the test-tube rack. Use masking tape to label each tube with one of the following names: calcium chloride, potassium chloride, sodium chloride, and unknown.

2. Use the table on the other side to record your results. Then, ask your teacher for your portions of the solutions. ***Caution:*** *Be very careful in handling all chemicals. Tell your teacher immediately if you spill a chemical.*

3. Light the burner as instructed by your instructor.

4. Clean the wire by dipping it into the dilute hydrochloric acid and then into distilled water. Holding the wooden handle, heat the wire in the blue flame of the burner until the wire is glowing and it no longer colors the flame. ***Caution:*** *Use extreme care around an open flame.*

5. Dip the clean wire into the first test solution. Hold the wire at the tip of the inner cone of the burner flame. Record in the table the color given to the flame.

6. Clean the wire by repeating step 4. Then, repeat step 5 for the other solutions.

7. Follow your teacher's instructions for cleanup and disposal.

)ATA & OBSERVATIONS

Test Results	
Compound	**Color of Flame**
Calcium chloride	
Potassium chloride	
Sodium chloride	
Strontium chloride	
Unknown	
Copper Chloride	

.NALYZE THE RESULTS

dentifying Patterns Is the flame color a test for the metal (calcium, potassium, sodium, strontium) or for the hloride in each compound? Explain your answer.

nalyzing Data What is the identity of your unknown solution? How do you know?

RAW CONCLUSIONS

/aluating Methods Why is it necessary to carefully clean the wire before testing each solution?

aking Predictions Would you expect the compound sodium fluoride to produce the same color as sodium loride in a flame test? Why or why not?

erpreting Information Each of the compounds you tested is made from chlorine, which is a poisonous gas at)m temperature. Why is it safe to use these compounds without a gas mask?