

Flame Test Lab

PSI Chemistry

Name_____

Purpose

Use the flame test to determine the identity of the cation in an unknown solution(slat) based on its characteristic color.

Materials

- Bunsen burner
- Small beaker
- Flame test wire- nichrome wire with loop
- 6 small weighing dishes
- HCl (3M)
- NaCl, KCl, LiCl, BaCl₂, CuCl₂, SrCl₂, CaCl₂

Procedure

1. Make a two-column data table. Label column one Metal and label column two Flame Color.
2. Clean the nichrome wire loop by alternately heating the wire in the burner flame and dipping it in a solution of concentrated hydrochloric acid. Repeat until the flame remains almost colorless when the wire is heated in the flame.
3. Dip the wire loop in the hydrochloric acid then into one of the salts so that a small amount of salt crystals stay on the wire loop. Bring the loop to the edge of the blue flame to produce the color and record in the data table. (Be careful not to drop the salt crystals into the burner).
4. Repeat with the remaining salts. Conclude by performing a flame test with an unknown salt and note the color.

Analysis and Conclusions

1. What is the identity of the metal in the unknown?

2. Each known salt has a unique color. Would you expect this based on the modern view of the atom? Explain?

3. Some commercially available fireplace logs burn with a red and/or green flame. On the basis of your data, what elements could be responsible for these colored flames?

4. Aerial fireworks contain gunpowder and chemicals that produce colors. What elements would you include to produce the following colors?

a. Crimson red

b. Yellow

Metal	Flame Color
Unknown	

For Teacher:

Metal flame color

Ca- Brick red/ red orange

Na- Yellow

Sr- Crimson red

Ba- pale green

Cu- Green

Li- Carmine red

K- Lilac/pale purple

This test can be done using cotton Q-tips also. Heat the Q-tip until no color is imparted to the flame. Recommend to the students that they try sodium last as it can overwhelm the other colors. Wet the tip in water before dipping in the salt. Then introduce it to the flame.