

Flame Test Lab

Activity Key

Background

The heat from a laboratory burner will cause the ions of some elements to give off light. Electrons will absorb the heat energy from the flame and will “jump” to a higher energy level. When the electrons return to their original energy levels, this absorbed energy is released as light. Different elements absorb and release different amounts of energy and thus produce different kinds of light. This light may be visible or invisible, infrared or ultraviolet radiation. Analysis of this light can be used to identify elements and molecules. In today’s lab, we will observe the visible range of light emission.

Objectives

1. Perform a flame test to identify the characteristic color of metal ions.
2. Identify the metal ion in an unknown solution.
3. Calculate the energy of emitted photons.

Materials: (per lab group)

10 ml dilute solutions of the following:

Barium Chloride
Calcium Chloride
Lithium Chloride
Potassium Chloride
Sodium Chloride
Strontium Chloride
Unknown Solution

7 Wood Splints

1 Bunsen Burner

Safety Goggles & Aprons

Note:

If chloride compounds are not available, metal nitrate compounds may be substituted.

Use dilute or approximately 0.1 M solutions

Unknowns:

Number the beakers 1-12.

Add solutions as follows:

1. Strontium Chloride

2. Calcium Chloride

3. Potassium Chloride

4. Barium Chloride

5. Lithium Chloride

6. Sodium Chloride

7. Calcium Chloride

8. Strontium Chloride

9. Barium Chloride

10. Potassium Chloride

11. Sodium Chloride

12. Lithium Chloride

Procedure

1. Put on your safety goggles and an apron.
2. Obtain a wood splint and the barium chloride solution.
3. Dip the wood splint into the solution and allow it to soak for 1-2 minutes.
4. Light Bunsen Burner. USE CAUTION!
5. Remove the splint from the solution and hold the end of the splint into the flame. Do not burn the splint.
6. Observe and record the color of the flame.
7. Repeat steps 2-6 using the remaining chloride solutions.
8. Obtain an unknown solution from your teacher. Record the number of your unknown.
9. Soak a wood splint in the unknown solution.
10. Hold the splint in the flame and record the color of the flame that is produced.
11. Using your data, identify the metal ion in your unknown solution.

Flame Test Lab Metal Ions Answer Key

Mr. Rohit Manglik



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