LAB FIVE

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Name	
Lab Partner(s)	
Section	
Date:	

Flame Tests

Objective

In this experiment you will:

- observe the flame colors emitted from selected ions;
- identify metallic ions by the color emitted during vaporization of the element;
- evaluate the usefulness of this method of metal identification.

Introduction

When elements are heated to high temperatures, they may be placed in an excited state. In an excited state, the electrons move to higher energy levels. Pre-changes in energy that occur when the excited atoms return to their groups are causes the substance to be luminous, or emit light. The observed colored respectrum, of the substance is caused by the set of visible wavelengths of the light emitted. Since each element emits a unique set of wavelengths, emission spectra can be used as a tool to identify the elements.

Or Childred used to demonstruct to exclussion spectrum of a substance is the flame test. Using this method, a small amount of a substance is heated and the characteristic glow of the substance is observed. In this experiment you will perform a flame test on several metallic salts. Based on your observations, you will develop a reference table which lists the flame color for each metal ion. You will then perform a flame test on an unknown substance. By comparing your observations to the data in your reference table, you will be able to identify the metal ion in the unknown substance. Finally, you will use cobalt glass as a tool for identifying the components of a metallic salt mixture.

Pre Lab Questions (answer on separate paper)

- 1. Describe the common characteristics of flame tests that would be observed if a spectroscope were used.
- 2. List *at least five* other means of qualitative analysis that are used to identify metals. (Use the index in your text or other reference sources.)
- 3. Explain the visual difference between emission spectra and absorption spectra.
- 4. Advertising lights are sealed tubes of various excited noble gases which emit colored light. Using references, briefly explain the chemistry behind how these advertising lights function.