Flame Tests

Just as a fingerprint is unique to each person, the color of light emitted after excitation of an element is different for each element. When a metallic element’s electrons absorb energy, by heating for example, the electron is said to become “excited”. When an excited electron moves back to its “ground state” (non-excited), energy is emitted in the form of light.

**Materials:**
- Toothpicks or wood splints
- Paper cups
- Large candle
- Metal pie pan
- Distilled water
- Pliers or tongs

*Solutions made from metal compounds:*
- Calcium (calcium chloride)
- Copper (copper chloride)
- Potassium (potassium chloride)
- Sodium (sodium chloride)

**Procedure:**
1. Dissolve a small amount of each metal compound in distilled water. (The concentration is not important) Use a separate paper cup for each metal solution. Label the cups with the names of the metal solutions. Fill and label one cup with plain distilled water to serve as a control.
2. Soak some wood splints or toothpicks in each solution cup.
3. Place a candle securely in the metal pie pan, and pour some water in the pan. Light the candle, remembering flame safety.
4. Use the tongs or pliers to hold a toothpick so the soaked end is in the candle’s flame. Observe the color, and record data in the table below.

<table>
<thead>
<tr>
<th>Metal</th>
<th>Color</th>
<th>Metal</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td></td>
<td>Potassium</td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td></td>
<td>Sodium</td>
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