The Periodic Table – properties of Group 2 elements – student sheet

In this experiment you will be observing and interpreting the changes when drops of solutions of various anions are added to drops of solutions of Group 2 element cations. Students must wear eye protection.

**Procedure**

- Cover the worksheet with a clear plastic sheet.
- Put one drop of magnesium solution into each box in the magnesium ions row.
- Repeat using calcium solution in the next row, then strontium solution in the next row and barium solution in the last row.
- Add one drop of fluoride solution to each drop in the fluoride ions column. Observe what happens.
- Repeat step 4 using each of the other solutions of anions in the subsequent columns. Observe each reaction carefully and record your observations.

<table>
<thead>
<tr>
<th></th>
<th>Fluoride ions</th>
<th>Chloride ions</th>
<th>Bromide ions</th>
<th>Iodide ions</th>
<th>Hydroxide ions</th>
<th>Sulfate ions</th>
<th>Carbonate ions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium ions</td>
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<td>Calcium ions</td>
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<td>Strontium ions</td>
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<td>Barium ions</td>
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</tbody>
</table>

**Question**

What explanations can you give for your observations?

**Health, safety and technical notes**

- Read our standard health and safety guidance here [https://rsc.li/3LNbkfo](https://rsc.li/3LNbkfo).
- Students must wear suitable eye protection (Splash resistant goggles to BS EN166 3).
- Magnesium nitrate, Mg(NO₃)₂.⁶H₂O(aq), 0.5 mol dm⁻³. Calcium nitrate, Ca(NO₃)₂.⁴H₂O(aq), 0.5 mol dm⁻³, Strontium nitrate, Sr(NO₃)₂ 0.5 mol dm⁻³. ⁴H₂O(aq) and Barium nitrate, Ba(NO₃)₂, 0.2 mol dm⁻³ are skin/eye irritants (see CLEAPSS Hazcard HC059b, HC019b, HC019d, HC011).
- Sodium hydroxide solution, NaOH(aq), 1 mol dm⁻³ is CORROSIVE (see CLEAPSS Hazcard HC091a).
• Sodium carbonate, Na₂CO₃·10H₂O, 0.5 mol dm⁻³ is an IRRITANT (see CLEAPSS Hazcard HC095a).
• Sodium sulfate, Na₂SO₄, 0.5 mol dm⁻³, Sodium chloride, NaCl(aq), 0.5 mol dm⁻³, Sodium fluoride, NaF(aq), 0.5 mol dm⁻³, Potassium iodide, KI(aq), 0.2 mol dm⁻³ and Potassium bromide, KBr(aq), 0.2 mol dm⁻³ are of low hazard (see CLEAPSS Hazcard HC098b, HC047b, HC089, HC047b).