Your notes

GCSE Chemistry: revision notes

Tests for ions and flame tests

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Flame tests

- Dip a clean nichrome wire loop into the sample and hold it in a blue Bunsen flame.
- Lithium: crimson. Sodium: yellow. Potassium: lilac. Calcium: orange-red. Copper: green.
- If a sample contains a mixture of ions, some flame colours can be hidden (masked).

Metal hydroxides

- Add a few drops of sodium hydroxide solution to a solution of the compound.
- Aluminium, calcium and magnesium ions form white **precipitates**. Only aluminium hydroxide dissolves when excess sodium hydroxide is added.
- Copper(II) forms a blue **precipitate**, iron(II) a green **precipitate** and iron(III) a brown **precipitate**.

Carbonates, halides and sulfates

- Carbonates: add dilute acid; carbon dioxide is produced, which turns limewater milky.
- Halides: add dilute nitric acid, then silver nitrate solution. Chloride gives a white **precipitate**, bromide a cream **precipitate** and iodide a yellow **precipitate**.
- Sulfates: add dilute hydrochloric acid, then barium chloride solution. A white **precipitate** forms.
- The acid is added first to remove carbonate ions, which would also form **precipitates**.

Instrumental methods

- Instrumental methods are accurate, sensitive and rapid.

- In **flame emission spectroscopy**, a sample is put into a flame and the light given out is passed through a spectroscope. The **line spectrum** identifies the metal ions and shows their concentration.

Your notes

Key terms

Flame test	Holding a sample in a flame to identify metal ions by the flame colour.
Precipitate	An insoluble solid that forms when two solutions are mixed.
Halide ion	A negative ion from a halogen, such as chloride, bromide or iodide.
Silver nitrate test	The test for halide ions, using nitric acid and silver nitrate solution.
Barium chloride test	The test for sulfate ions, which forms a white precipitate.
Flame emission spectroscopy	An instrumental method that analyses the light given out by ions in a flame.
Line spectrum	The pattern of coloured lines produced by a particular metal ion.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What flame colour does sodium give?
2. What flame colour does potassium give?
3. Which metal ion gives a green flame?
4. What colour precipitate does iron(III) form with sodium hydroxide?
5. Which white hydroxide precipitate dissolves in excess sodium hydroxide?
6. What colour precipitate does a chloride form with silver nitrate?
7. What is the test for sulfate ions?
8. How can you test for carbonate ions?

Answers

1. Yellow
2. Lilac
3. Copper
4. Brown
5. Aluminium hydroxide
6. White
7. Add hydrochloric acid, then barium chloride: a white precipitate forms
8. Add dilute acid and test the gas with limewater

What to do next

Practise 11 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

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