Identify ions in unknown salts

AQA 8462 Separate Chemistry · Foundation and Higher

Use the test results as evidence for each identification.

Name _____ Date _____

1. Read two flame colours

Two salts contain metal ions covered by your course's flame tests. One gives a crimson flame and the other gives a green flame. Name both ions and give their symbols, including the charges.

2. A green precipitate

Adding sodium hydroxide solution to a sample immediately gives a green precipitate. Choose the ion from Cu^{2+}, Fe^{2+} and Fe^{3+}. State the observation expected for each of the other two ions.

3. Check the white precipitate

Three possible cations are Al^{3+}, Ca^{2+} and Mg^{2+}. Adding a little sodium hydroxide solution gives a white precipitate. What should the student do next to test for aluminium? Explain the result to look for.

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4. Gas and limewater

A solid fizzes when dilute acid is added. The gas turns limewater cloudy. Name the gas and choose the ion from carbonate, chloride and sulfate.

5. A silver nitrate test

A student adds dilute nitric acid and then silver nitrate solution to a sample. A cream precipitate forms. Identify the ion in the sample and name the precipitate.

6. A barium chloride test

A student adds dilute hydrochloric acid and then barium chloride solution to a sample. A white precipitate forms. Identify the ion in the sample and name the precipitate.

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7. Choose the correct acid

A student adds dilute hydrochloric acid before testing an unknown solution for chloride with silver nitrate. Explain why this can give a misleading result and name the acid to use.

8. Put two observations together

A salt gives an orange-red flame. On a fresh sample, dilute nitric acid followed by silver nitrate gives a white precipitate. The anion is chloride, bromide or iodide.

Identify both ions and give the name and formula of the salt.

9. Extra challenge · An inconsistent set of results

One bottle contains aluminium chloride, calcium chloride or magnesium sulfate. A little sodium hydroxide gives a white precipitate that stays in excess. A fresh sample gives a white precipitate with dilute hydrochloric acid and barium chloride.

The flame test gives a faint orange-red colour, but the wire was just used for a known calcium sample. Identify the best-supported salt. Use the results to rule out both alternatives and give a check for the flame test.

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