

AQA – Oxidation, reduction and redox equations – AS Chemistry P11. **No.1**

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A student does a series of reactions with aqueous solutions of some potassium halides (**P**, **Q** and **R**) of equal concentration. Each solution contains a different halide ion (chloride, bromide or iodide).

The student adds 3 drops of bromine water to 3 drops of each aqueous solution of potassium halide. The student also adds 3 drops of the bromine water to 3 drops of water.

Table 1 shows the student's observations.

Table 1

	Observation when 3 drops of bromine water are added
Solution P	Orange solution
Solution Q	Brown solution
Solution R	Orange solution
Water	Orange solution

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Identify the halide ion present in **Q**.

Give the ionic equation for the reaction that occurs when bromine water is added to **Q**.
[2 marks]

Halide ion in **Q** _____

Ionic equation

0 1 . 2

Explain, in terms of oxidising ability, why the observations from these reactions do **not** allow the student to identify the halide ion present in **P** and the halide ion present in **R**.

[2 marks]

0 1 . 3

The student does a second experiment to determine the halide ion in each of **P** and **R**.

The student adds a few drops of aqueous silver nitrate solution to 2 cm³ of each potassium halide solution.

Table 2 shows the student's observations.

Table 2

	Student's Observation
P	Precipitate formed
R	Precipitate formed

Describe a further chemical test that the student can complete on the precipitates formed to identify the halide ion present in **P** and the halide ion present in **R**.

Describe how the observations from this test can be used to identify the halide ion present in **P** and the halide ion present in **R**.

[3 marks]

2. No.9

09

This question is about redox reactions.

09.1

State, in terms of electrons, the meaning of the term oxidising agent.

[1 mark]

09.2

Give a half-equation to show the oxidation of copper to copper(II) ions.

[1 mark]

09.3

Give a half-equation to show the reduction of NO_3^- ions in acidic solution to NO_2

[1 mark]

09.4

Use your answers to Question 09.2 and Question 09.3 to deduce an overall equation for the reduction of NO_3^- ions by copper.

[1 mark]
