

8.3 Group VII properties

Name: _____ Class: _____ Date: _____

Total: 9 marks

KEY WORDS chlorine 氯气 • iodine 碘 • bromine 溴 • halogens 卤素 • displacement reaction 置换反应

Objective

Build the skills to answer exam questions on **Group VII — the halogens** 卤素 — their appearance, trends, and **displacement reactions** 置换反应.

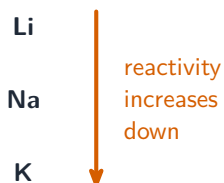
You must be able to:

- describe the halogens (diatomic, colours/states) and the trends down the group
- write and explain a halogen displacement reaction
- predict the products of a displacement

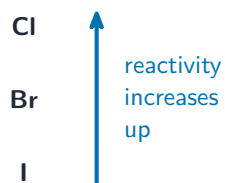
1 Worked examples

■ Displacement

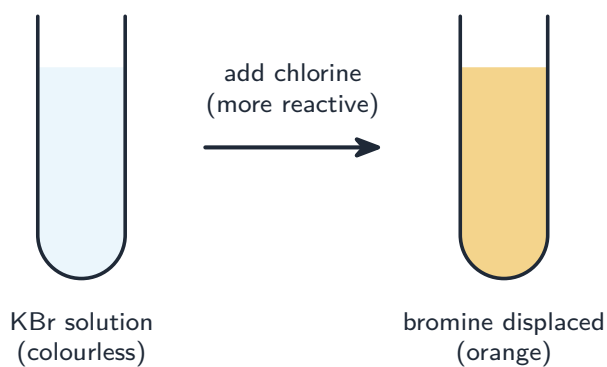
Group I



Group VII



Down Group VII the reactivity decreases (opposite to Group I)



A more reactive halogen displaces a less reactive halide from its solution

$\text{Cl}_2 + 2\text{KBr} \rightarrow 2\text{KCl} + \text{Br}_2$ — chlorine (more reactive) displaces bromine.

2 Practice

2.1 State the colour and state of chlorine at room temperature. [1]

2.2 State the trend in reactivity down Group VII. [1]

3 Exam-style questions

3.1 Which halogen is the most reactive? [1]

- **A** chlorine
 - **B** bromine
 - **C** iodine
 - **D** they are equal
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3.2 Chlorine is bubbled into colourless potassium iodide solution.

(a) Write the equation for the reaction. [2]

(b) State and explain the colour change. [2]

3.3 Predict whether bromine will displace chlorine from potassium chloride, and explain your answer. [2]

Solutions

2.1 a pale yellow-green gas.

2.2 reactivity decreases.

3.1 A. Chlorine is the most reactive (reactivity decreases down the group).

3.2 (a) $\text{Cl}_2 + 2\text{KI} \rightarrow 2\text{KCl} + \text{I}_2$.

(b) the solution turns brown/orange; because iodine has been displaced/formed.

3.3 no — bromine will not displace chlorine; because chlorine is more reactive than bromine, so only a more reactive halogen can displace a less reactive one.