

11 The halogens – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)
halogens	卤素	_____
volatility	挥发性	_____
van der Waals' forces	范德华力	_____
oxidising agent	氧化剂	_____

Recall

At IGCSE you met the **halogens** 卤素 (Group 17) and saw that a more reactive halogen can displace a less reactive one. Now we explain the trends.

- The halogens are **diatomic** molecules: Cl_2 , Br_2 , I_2 .
- Their reactivity (as oxidising agents) changes down the group.

Nothing here is harder than IGCSE — it just adds the reasons.

New ideas

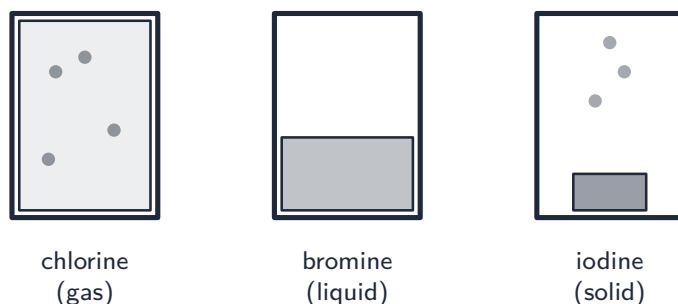
Read these first, then do the Practice.

■ 1 Colour, state and volatility

Halogen	At room temperature
chlorine	pale green gas
bromine	red-brown liquid
iodine	grey-black solid

The **volatility** 挥发性 (how easily it turns to vapour) **decreases** down the group.

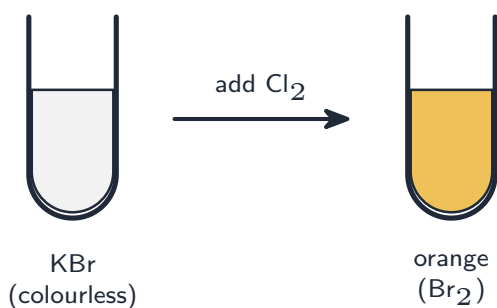
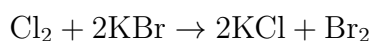
The molecules get larger with more electrons, so the **van der Waals' forces** 范德华力 between them get stronger, raising the boiling point.



■ 2 Oxidising power and displacement

Each halogen gains one electron to form a **1- ion**, acting as an **oxidising agent** 氧化剂. This power **decreases** down the group (larger atoms attract the extra electron less strongly).

So a more reactive halogen **displaces** a less reactive one from its salt:



Watch out: a more reactive (more oxidising) halogen displaces a less reactive one — so chlorine displaces bromine and iodine, but iodine cannot displace chlorine.

Practice

Try these in order.

11.1 Give the colour and state of (a) chlorine, (b) iodine at room temperature. [2]

11.2 Describe and explain the trend in volatility down Group 17. [3]

11.3 Each halogen acts as an oxidising agent. Explain what this means in terms of electrons. [1]

11.4 State the trend in oxidising power down the group. [1]

11.5 Write the equation for chlorine reacting with potassium bromide, and state the colour change. [2]

11.6 Challenge. Predict whether bromine will displace iodine from potassium iodide. Write an equation if it reacts, and explain. [2]