

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

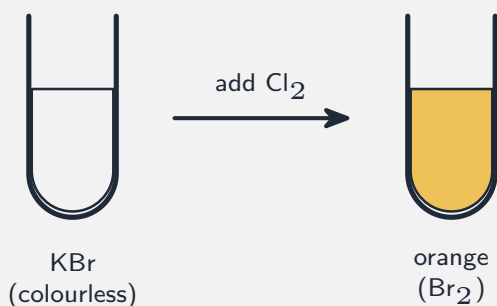
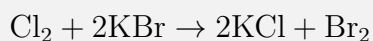
力 between them get stronger, raising the boiling point.



■ 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]