

C4.1.2 Group 7 - The Halogens

Lesson Objectives

- Recall the physical and chemical properties of group 7 elements
- Predict properties from given trends
- Explain the reactions of group 7 elements

Recall the **physical** and chemical properties of group 7 elements

Halogen	Appearance at room temperature
Fluorine	Pale yellow gas
Chlorine	Pale green gas
Bromine	Orange brown liquid
Iodine	Shiny black solid crystalline solid

Iodine is unusual in that it doesn't melt. Instead it sublimates to give a purple vapour.

Recall the **physical** and chemical properties of group 7 elements

All halogens are diatomic

- The element exists as molecules which contain two atoms
- Their formulae are F_2 , Cl_2 , Br_2 , I_2

Recall the **physical** and chemical properties of group 7 elements

As you go down Group 7, the following trends occur:

The density increases

The melting and boiling points increase

Recall the physical and **chemical** properties of group 7 elements

Group 7 elements have 7 electrons in their outer shell

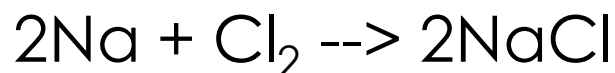
When they react they will gain one electron to gain a full outer shell

This electron will come from a metal

Recall the physical and **chemical** properties of group 7 elements

A typical reaction of a Group 7 element is to react with a Group 1 element to form a salt

e.g. sodium + chlorine \rightarrow sodium chloride



Remember (from C2.2.4)

- The halogen turns into a halide ion
- Its charge is -1
- The **-ine** changes to **-ide** in the name of the salt

Explain the reactions of group 7 elements

Group 7 elements gain an electron when they react

As you go down the group the atom gets larger

Larger atoms will have a weaker attraction between the positive nucleus and the electron they are trying to attract

Larger atoms will therefore find it more difficult to attract an electron

Larger atoms will therefore be less reactive

Therefore the trend in reactivity is that Group 7 elements become less reactive as you go down the group

Predict properties from given trends

We can use trends in data to predict physical properties

- Look at the gaps between the elements below and extrapolate

Halogen	Melting Point (°C)	Boiling Point (°C)	Density (g/cm ³)
Fluorine	-220	-188	0.00155
Chlorine	-101	-15	0.00290
Bromine	-7	59	3.10
Iodine	114	184	4.93
Astatine			

Predict properties from given trends

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Astatine	300	350	7.00