

Name: _____

Date: _____

AQA A-LEVEL CHEMISTRY

Introduction to Halogenoalkanes: Structure, Naming and Polarity

Learn Pack

This pack is designed to be completed alongside the video to help you build a secure understanding of this topic before moving on to revision and exam practice.

How to use this Learn Pack:

1. Watch the video and complete the activities.
 2. Answer the Fact Recall and Application questions.
 3. Check your work using the Learn Pack
- Answers available at mrcolescience.co.uk.

WATCH THE LESSON



Halogenoalkanes

Halogenoalkanes are alkanes that have had one or more hydrogen atoms substituted with a halogen atom.

Draw an example of a halogenoalkane below:

Lesson Objectives:

- Understand how halogenoalkanes are structured and how they are named using IUPAC rules.
- Explain why carbon-halogen bonds are polar and how their polarity varies between different halogenoalkanes.
- Understand why halogenoalkanes are more reactive than alkanes and why they remain insoluble in water.

Naming Halogenoalkanes

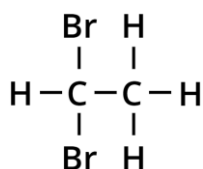
Halogenoalkanes are named using the standard IUPAC rules. Prefixes are used to denote which halogen(s) are present in the molecule and when there is more than one of any type of halogen present another prefix is added to indicate how many are present in the molecule.

Complete the tables below:

Halogen	Prefix
Fluorine	
Chlorine	
Bromine	
Iodine	

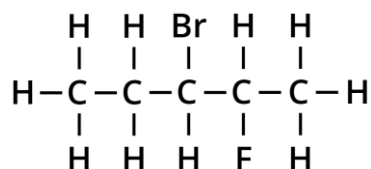
No. of Halogen atoms	Prefix
2	
3	
4	
5	

Name the following halogenoalkanes and identify the common mistakes that are made when naming them:



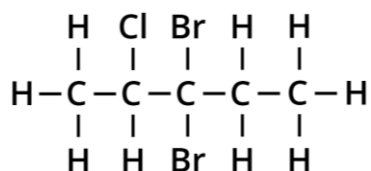
Name:

Common mistakes:



Name:

Common mistakes:



Name:

Common mistakes:

Polarity of Halogenoalkanes

Carbon-halogen bonds are polar and this significantly affects both the physical properties and reactivity of halogenoalkane molecules. Carbon-halogen bonds are polar due to the difference in electronegativity between carbon and the halogens.

Define electronegativity:

All halogens are more electronegative than carbon.

Explain why this causes the carbon-halogen bond to be polar:



The electronegativity value of the halogens decreases as you move down the group. This means that the polarity of the carbon-halogen bond also decreases as you move down the group.

Reactivity

Alkanes are relatively unreactive for two reasons:

- 1.
- 2.

Since carbon-halogen bonds are polar this makes halogenoalkanes significantly more reactive than their alkane equivalents.

Solubility

Halogenoalkanes are also insoluble in water; despite the carbon-halogen bond being polar, it is not polar enough to make them soluble in water.

Practise Questions – Fact Recall

1. What is a halogenoalkane?

2. Which carbon-halogen bond is the most polar?

3. What is electronegativity?

4. What prefix is used to indicate there are three of the same halogen present in a halogenoalkane molecule?

5. What prefix is used to indicate the presence of a bromine atom in a halogenoalkane molecule?

Practise Questions – Application

1. Explain why carbon-halogen bonds are polar.

2. Explain why halogenoalkanes are more reactive alkanes.

Next Steps

*Check your work using the Learn
Pack Answers:*

