

Name: _____

Date: _____

AQA A-LEVEL CHEMISTRY

Elimination of Halogenoalkanes: Mechanism, Reagents & Conditions

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



Elimination Reactions

During an elimination reaction, an atom or a group of atoms is _____ from the starting molecule without being _____.

When halogenoalkanes undergo elimination reactions the _____ is eliminated as a _____ and the halogenoalkane forms an _____.

Lesson Objectives:

- Describe what elimination reactions are.
- Know the reagents and conditions needed for the elimination of halogenoalkanes.
- Be able to outline the mechanism for the elimination of halogenoalkanes.
- Understand how elimination reactions can produce position and E/Z isomers of alkenes.

Give an overall equation for the elimination of halogenoalkanes:

Reaction Conditions

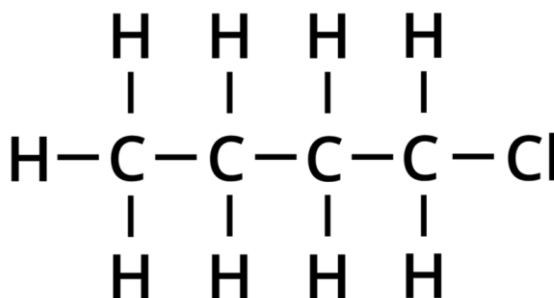
To help ensure that an elimination reaction takes place, rather than nucleophilic substitution, there are three reaction conditions that are used:

- 1.
- 2.
- 3.

Reaction Mechanism

Complete the reaction mechanism below:

1. The hydroxide ion attacks a hydrogen atom that is bonded to a carbon atom that is adjacent to the C-X bond.
2. The C-H bond breaks and those electrons form the C=C double bond.
3. The C-X bond breaks, eliminating a halide ion.



Products of Elimination and Isomerism

During the elimination of halogenoalkanes, it is possible to form a mixture of alkenes that are isomers of one another. There are two types of isomerism that can be demonstrated in the products; position isomerism and E-Z isomerism.

Using 2-chlorobutane as an example, show how elimination reactions can produce both position and E/Z isomers:

Practise Questions – Fact Recall

1. Briefly describe what an elimination reaction is.

2. Name a reagent that can be used in the elimination reactions of halogenoalkanes.

3. What conditions favour elimination reactions over nucleophilic substitution?

Practise Questions – Application

1. Draw the mechanism for the reaction of 1-bromopropane with sodium hydroxide dissolved in ethanol.
2. Outline the mechanism for the reaction of 2-bromopropane with sodium hydroxide to form an alkene that does not demonstrate stereoisomerism.
3. 2-bromo-2-methylpentane is heated with potassium hydroxide dissolved in ethanol. Two structural isomers are formed. Name and draw the mechanism for the formation of one of the isomers.

Next Steps

*Check your work using the Learn
Pack Answers:*

