

Name: _____

Date: _____

AQA A-LEVEL CHEMISTRY

Substitution Vs Elimination: Conditions and Reaction Pathways

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



Substitution Vs Elimination Reactions

During nucleophilic substitution reactions
halogenoalkanes react with _____
to form _____.

During elimination reactions halogenoalkanes
react with _____ to form
_____.

Lesson Objectives:

- Understand concurrent substitution and elimination reactions of halogenoalkanes.
- Be able to explain the role of the hydroxide ions as both a nucleophile and a base.
- Understand how the conditions used can favour one reaction over the other.

Both reactions however use the same reactant, _____, meaning that both reactions tend to occur alongside one another, or _____.

Reaction Conditions

The conditions under which the reaction takes place have a significant impact on which of the two reaction types is more likely to occur.

Complete the table below to summarise which conditions favour which reaction:

Factor	Nucleophilic Substitution	Elimination
Solution Type		
Temperature		
Refluxing		

However, regardless of which conditions are used, it's highly likely that both types of reaction will occur simultaneously, or concurrently and so you're likely to end up with a mixture of products.

Role of the Hydroxide Ions

Depending upon the type of reaction occurring the hydroxide ion will have different roles.

During nucleophilic substitution reactions the hydroxide ions are behaving as a _____ since they are donating a _____. Whereas during an elimination reaction the hydroxide ions are acting as a _____ since they are accepting a _____.

Questions – Fact Recall

1. What conditions favour a nucleophilic substitution reaction between halogenoalkanes and potassium hydroxide?

2. What conditions favour elimination reactions over nucleophilic substitution?

3. What type of reagent does the hydroxide ion act as during an elimination reaction?

4. During a nucleophilic substitution reaction, hydroxide ions behave as what?

5. What does the term concurrent mean?

Questions – Application

1. Explain why changing the solvent from water to ethanol changes the reaction that is favoured when 2-bromopropane reacts with hydroxide ions.

2. A student carries out the reaction between 2-bromopropane and aqueous potassium hydroxide. They obtain both propan-2-ol and propene. Explain why a mixture of products is obtained.

3. A student claims: "If ethanolic potassium hydroxide is used, only elimination occurs because the hydroxide ions are acting as bases." Is the student's statement correct? Explain your answer.

4. Hydroxide ions can behave as either a nucleophile or a base when reacting with a halogenoalkane. Explain how the hydroxide ion behaves differently in the two reactions.

Next Steps

*Check your work using the Learn
Pack Answers:*

