

The 4 Most Important Mechanistic Elements

The following are expressed from the point of view of the carbon-containing molecule taking part in a reaction

- 1) **Make a bond** between a nucleophile and electrophile.
- 2) **Break a bond** to give stable molecules or ions.
- 3) **Add a proton**
- 4) **Take a proton away**

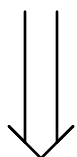
Mechanism Summary

The following questions and mechanistic elements are described from the point of view of the carbon-containing reagent, written in the form of a flowchart.

Is there a strong acid present or is the carbon-containing reagent a strong base?

YES →

Add a proton

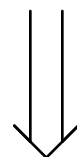


NO

Is there a strong base present or is the carbon-containing reagent a strong acid?

YES →

Take a proton away

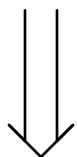


NO

Are there a nucleophile and electrophile present?

YES →

Make a bond

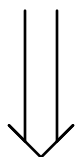


NO

Can a bond be broken to create stable molecules or ions?

YES →

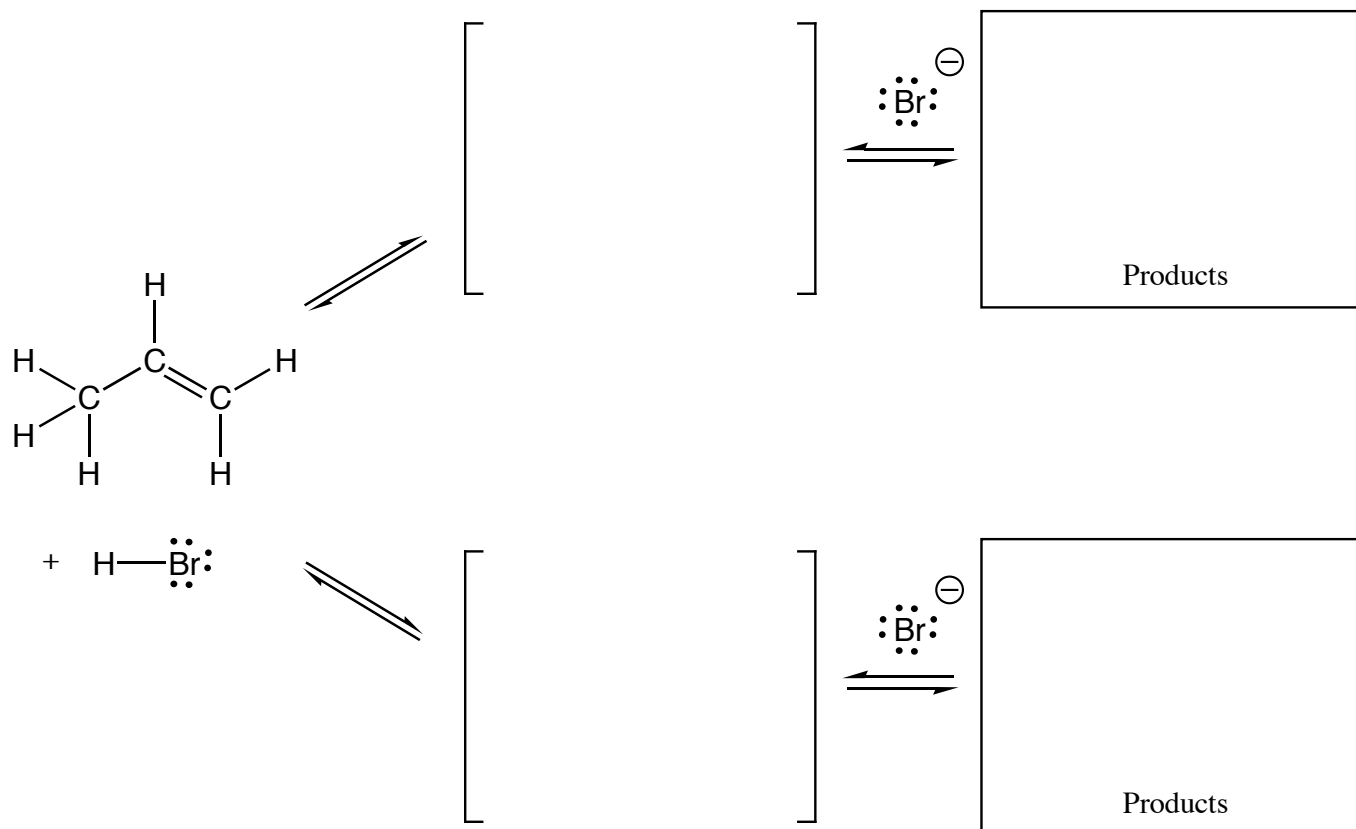
Break a bond



NO

Think about alternative mechanistic elements

Addition of H-X to an Alkene

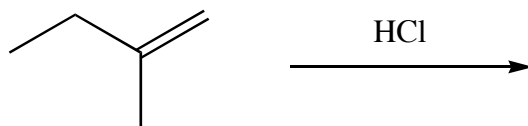


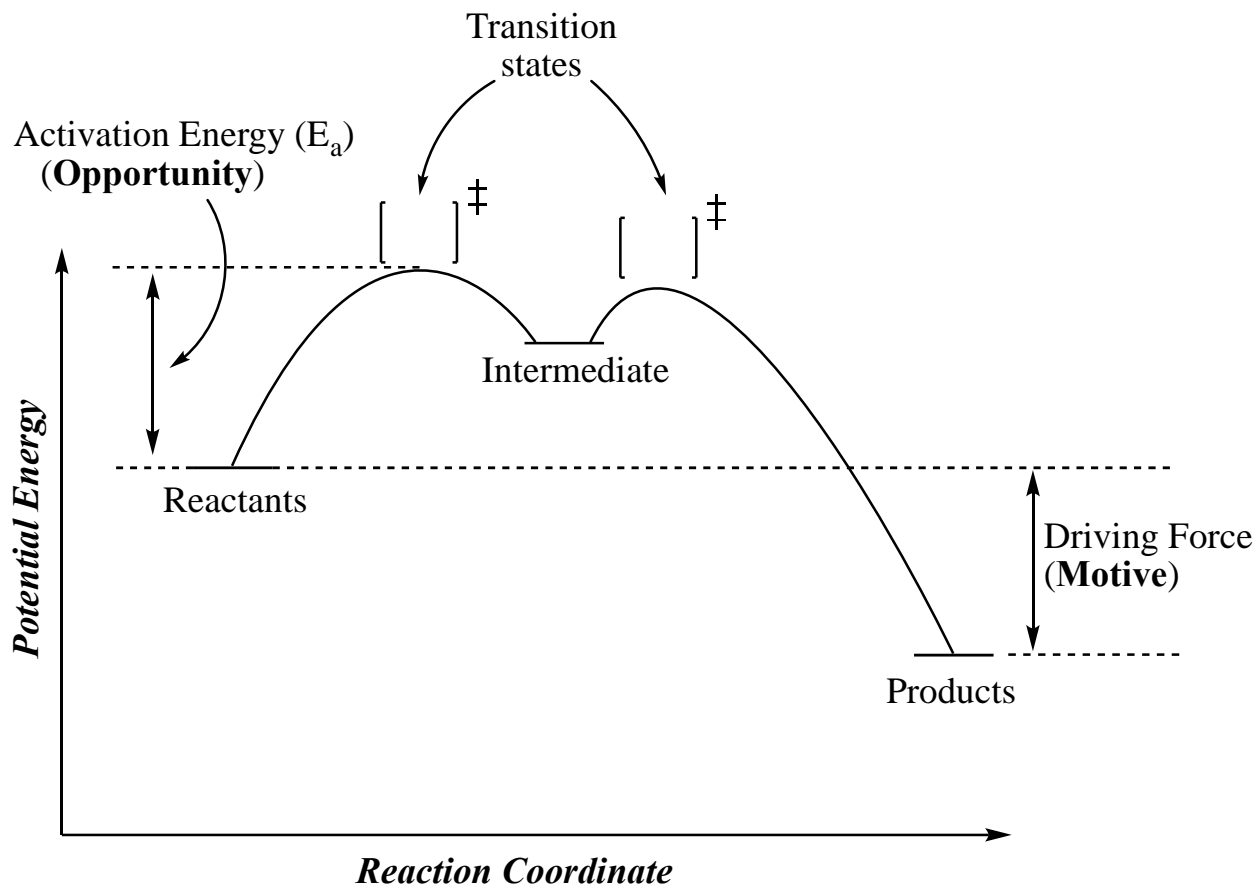
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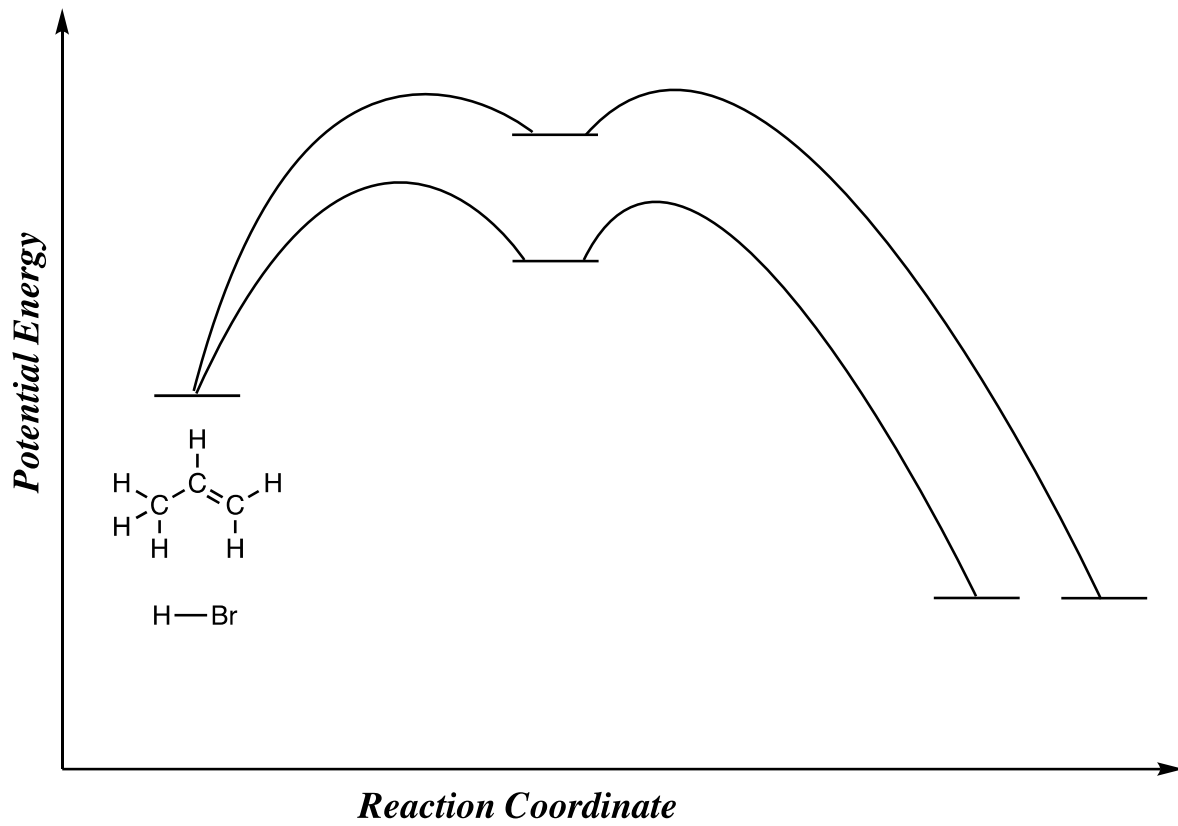
Regiochemistry:

Stereochemistry:

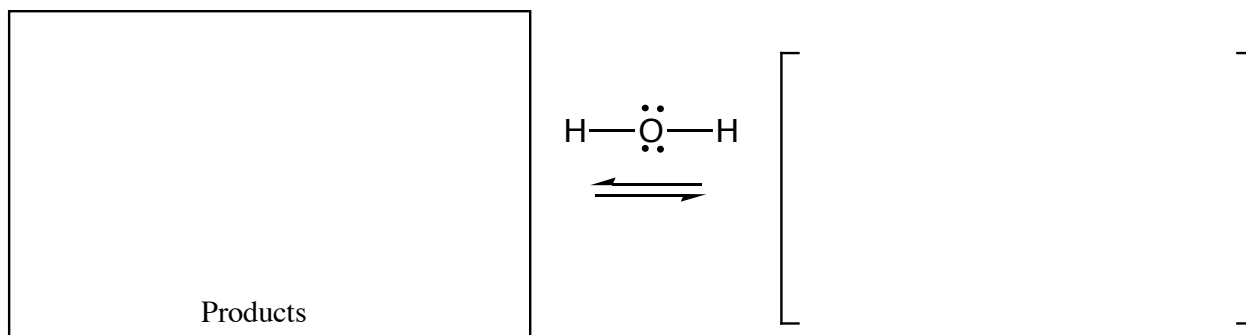
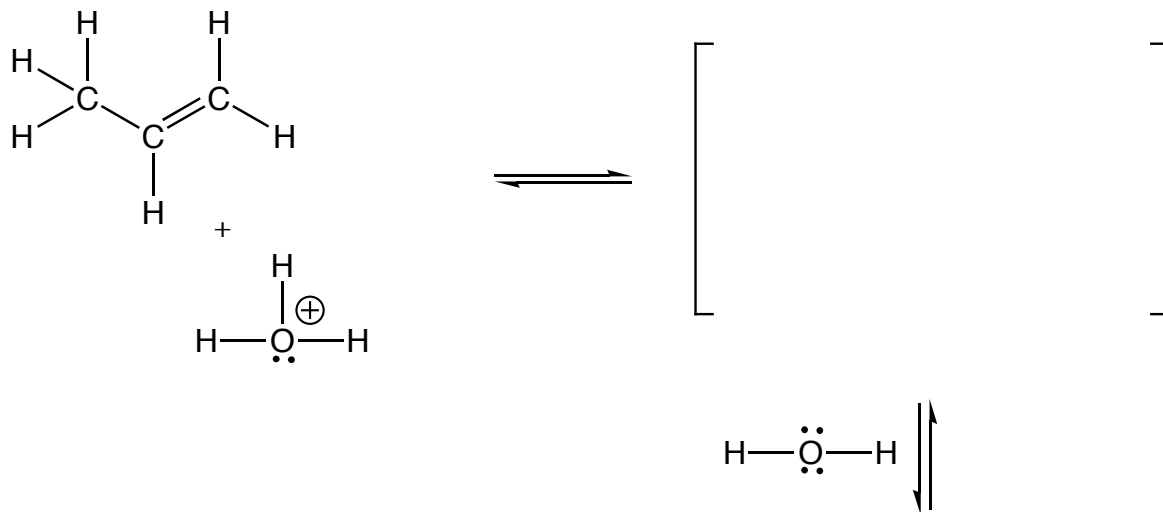
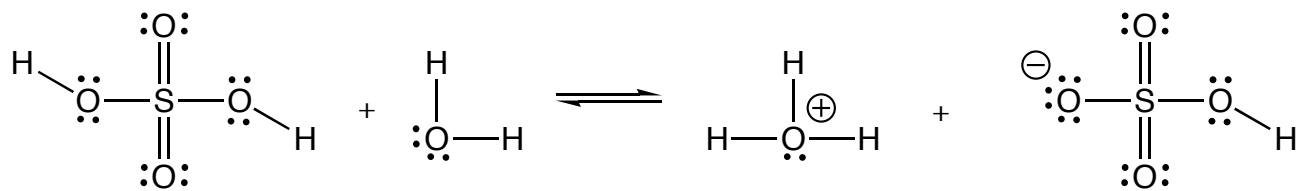
Example:







Acid-catalyzed Hydration of an Alkene

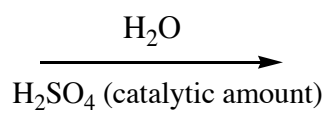
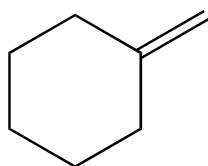


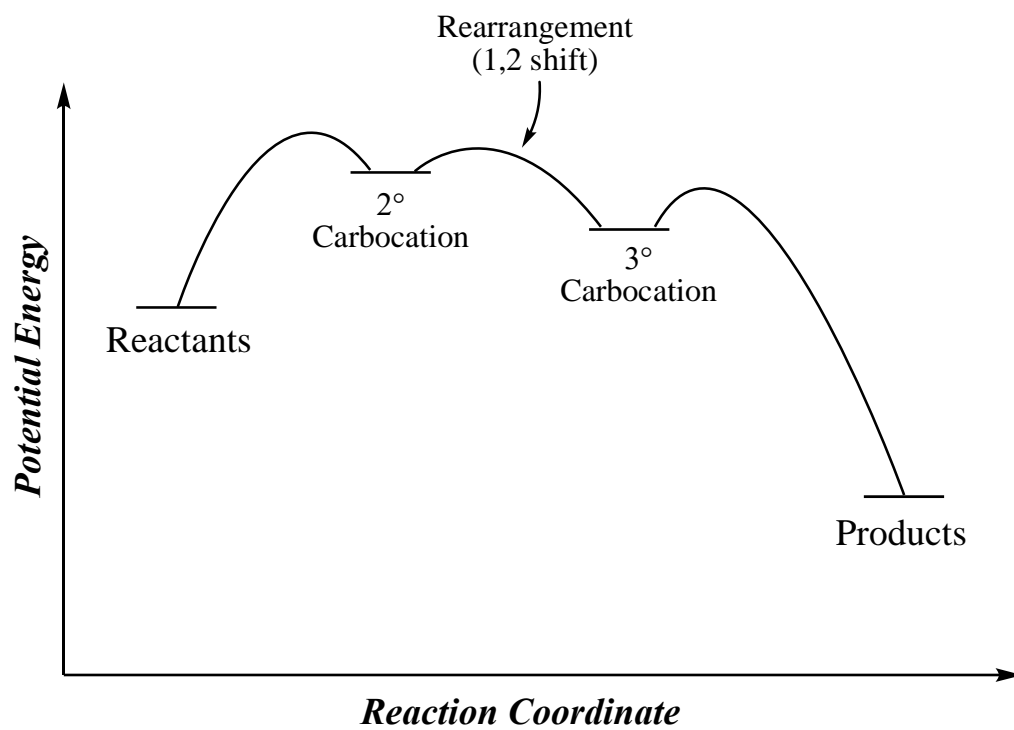
Summary:

Regiochemistry:

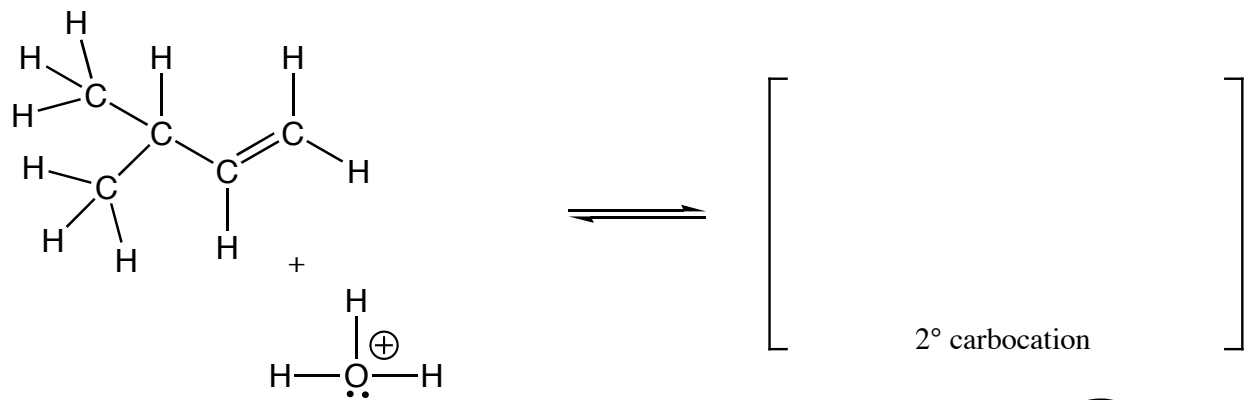
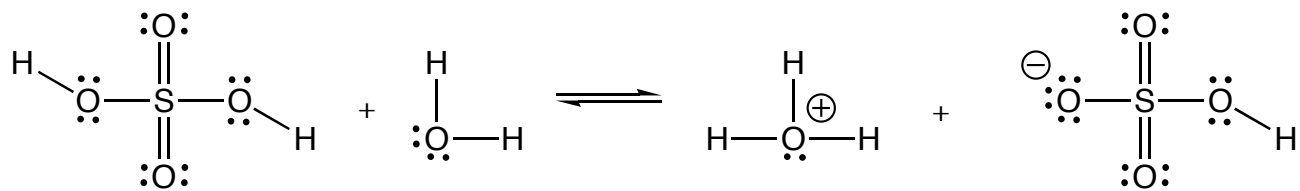
Stereochemistry:

Example:

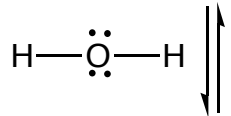
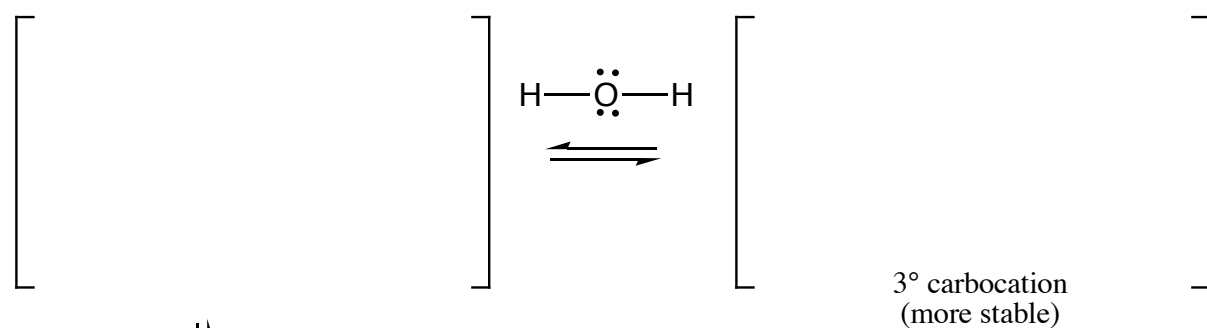




Cation Rearrangement

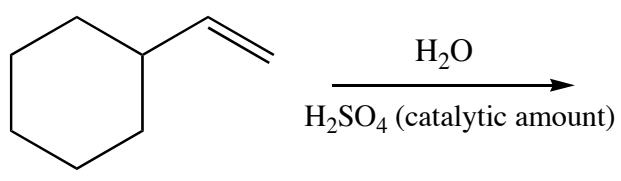


Rearrangement \rightleftharpoons 

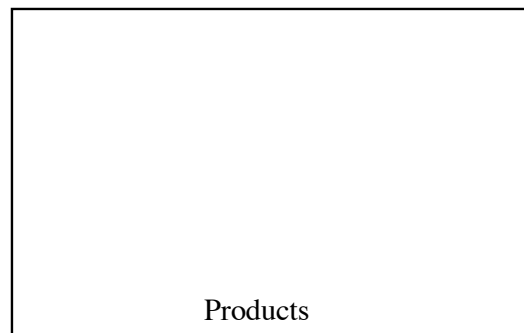
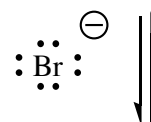
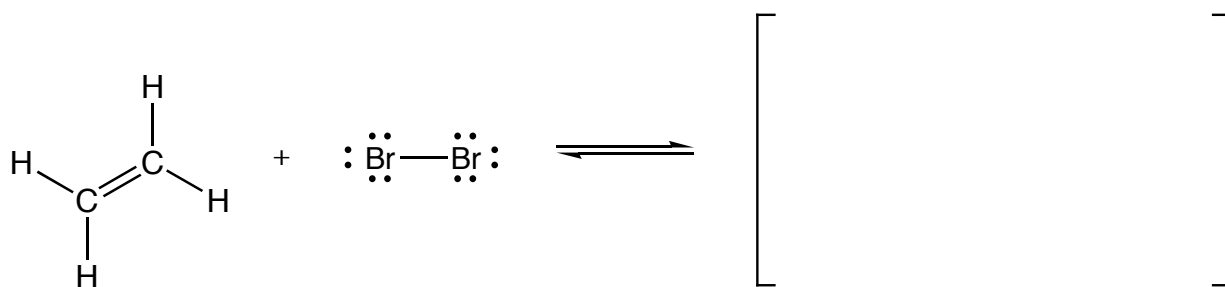


Products

Example:



Alkene Halogenation

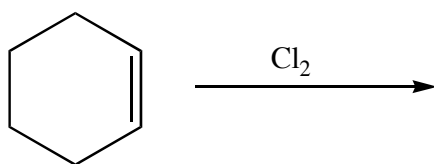


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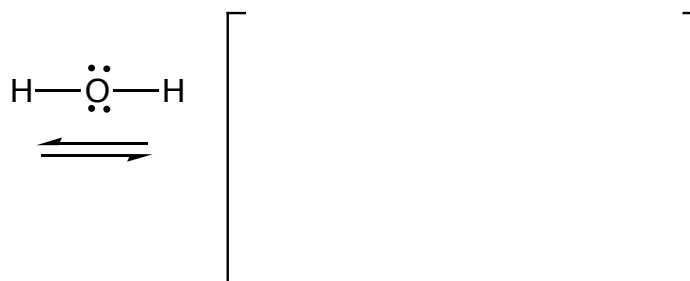
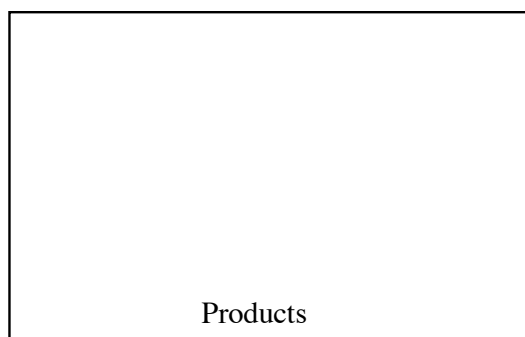
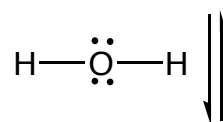
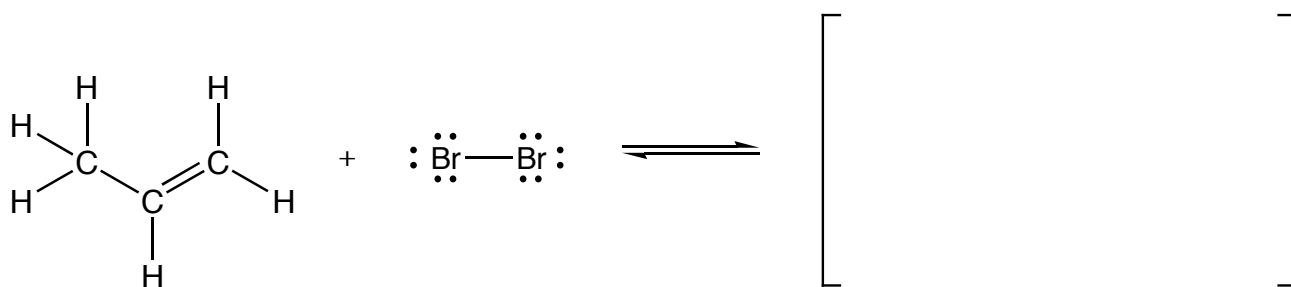
Regiochemistry:

Stereochemistry:

Example:



Alkene Hydrohalogenation



Summary:

Regiochemistry:

Stereochemistry:

Example:

