OCR (B) Chemistry A-Level
OZ5 - Reaction Mechanisms

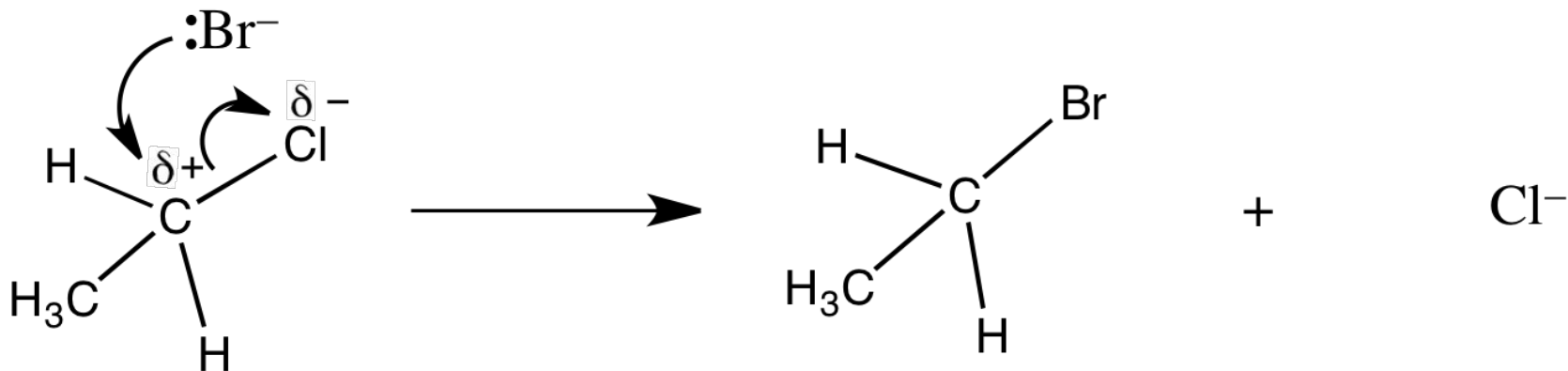Flashcards

What is the mechanism for nucleophilic substitution of haloalkanes.

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What is the most important factor in determining the rate of hydrolysis of haloalkanes?

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The carbon-halogen bond enthalpy is the most important factor as is proven by the increased rate of hydrolysis as we move down group 7 for haloalkanes.

How are polarity of a halogen containing molecule and its boiling point related?

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The greater the polarity of the molecules, the stronger their intermolecular dipole bonds will be. The bonds will take more energy to break so the boiling point of the halogen compound will be higher.
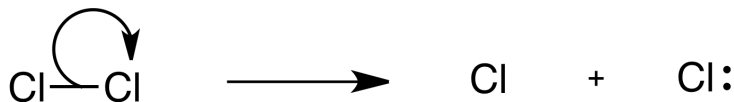
# What is the difference between homolytic and heterolytic bond fission?

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In homolytic bond fission each of the bonded atoms gets one electron from the shared pair producing radicals. In heterolytic bond fission one of the bonded atoms gets both of the shared electrons.

Heterolytic bond fission

Cl—Cl $\longrightarrow$ Cl + Cl:

Homolytic bond fission

Cl—Cl $\longrightarrow$ Cl· + Cl·
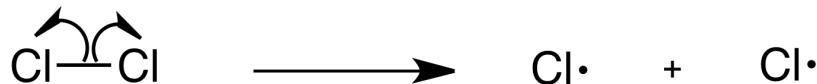
What is a radical?

What is a radical?

A highly reactive atom, molecule or ion due to a single, unpaired electron.

Homolytic bond fission

Cl—Cl ⟶ Cl• + Cl•

What is the mechanism for free radical substitution of methane?

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Initiation: $Cl_2 \rightarrow 2Cl\bullet$

Propagation: $Cl\bullet + CH_4 \rightarrow CH_3\bullet + HCl$

$CH_3\bullet + Cl_2 \rightarrow CH_3Cl + Cl\bullet$

Termination: $2Cl\bullet \rightarrow Cl_2$

$2CH_3\bullet \rightarrow C_2H_6$

$CH_3\bullet + Cl\bullet \rightarrow CH_3Cl$