Alkenes can be obtained from haloalkanes (alkyl halides). These haloalkanes are usually bromo and iodo and less commonly, chloro derivatives. Haloalkanes on heating with alcoholic \((\text{KOH})\) loses one molecule of hydrogen halide to give alkene.

\[
\begin{align*}
\text{haloalkane} & \xrightarrow{\text{heat}} \text{alkene} \\
\end{align*}
\]

Example \(\PageIndex{1}\)

Bromoethane gives ethene,

\[
\begin{align*}
\text{H} & \quad \text{H} \\
\text{Br} & \quad \text{H} \\
\end{align*}
\]

\[
\begin{align*}
\text{H} & \quad \text{C} \quad \text{C} \quad \text{H} \quad + \quad \text{KOH} \quad (\text{alcoholic}) \quad \xrightarrow{\text{heat}} \quad \text{H} \quad \text{C} \quad \text{C} \quad \text{H} & \quad \text{H} \\
\text{Br} & \quad \text{H} \quad & \quad \text{Br} \quad & \quad \text{H} \quad & \quad \text{KBr} \quad & \quad \text{H} \quad \text{O} \\
\end{align*}
\]

Example \(\PageIndex{2}\)

Iodopropane yields propene

\[
\begin{align*}
\text{H} & \quad \text{C} \quad \text{C} \quad \text{H} \quad \text{I} \\
\text{Iodopropane} & \quad \xrightarrow{\text{heat}} \quad \text{H} \quad \text{C} \quad \text{C} \quad \text{H} & \\
\text{H} & \quad \text{I} \quad & \quad \text{I} \quad & \quad \text{H} \quad & \quad \text{I} \quad & \quad \text{H} \\
\end{align*}
\]

1-bromopropane gives propene

\[
\begin{align*}
\text{H} & \quad \text{C} \quad \text{C} \quad \text{H} \quad \text{C} \quad \text{Br} \\
\text{1-bromopropane} & \quad \xrightarrow{352-358^\circ} \quad \text{H} \quad \text{C} \quad \text{C} \quad \text{H} \quad \text{C} & \\
\text{Br} & \quad & \quad \text{H} \quad & \quad \text{Br} \quad & \quad \text{H} \quad \text{O} \\
\end{align*}
\]

If two alkenes may be formed due to dehydrohalogenation of a haloalkane, the one which is most substituted is the main product.

Example \(\PageIndex{3}\)

For example, dehydrohalogenation of 2-bromobutane gives,

The order of reactivity of haloalkanes in dehydrohalogenation is, Tertiary > Secondary > Primary. Note: Reactions in which a small molecule like \((\text{H}_2\text{O})\) or \((\text{HX})\) is lost are known as elimination reactions.

**Alkenes from Vicinal Dihaloalkanes**

Vicinal dihaloalkanes are those dihalogen derivatives of alkanes in which two halogen atoms are on the adjacent carbon atoms. Alkenes can be obtained from vicinal dihaloalkanes by dehalogenation. When such a dihaloalkane is heated with zinc in methanol, an alkene is formed.
Example 4

1,2-dibromoethane gives 1,2-dibromoethane ethene

Contributors

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