

Chemguide – questions

ALKENES: MAKING ALKENES

- Alcohols can be dehydrated to alkenes using aluminium oxide.
 - What is the role of the aluminium oxide?
 - Give the conditions for the dehydration of an alcohol using aluminium oxide.
 - Write the equation for the dehydration of propan-1-ol, $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$, using aluminium oxide.
- Give the conditions for the dehydration of ethanol using concentrated sulphuric acid.
 - The ethene produced from this reaction has to be passed through sodium hydroxide solution to remove gaseous impurities. What are these impurities, and why are they formed during the reaction?
 - If you use concentrated phosphoric(V) acid, H_3PO_4 , instead of concentrated sulphuric acid, you don't get these impurities. Why not?
 - Write the equation for the dehydration of cyclohexanol using concentrated phosphoric(V) acid. (Cyclohexanol is a cyclohexane ring with one of the hydrogens replaced by an -OH group.)
- Draw the structures of the alkene(s) that might be produced if you dehydrate:
 - butan-1-ol, $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$
 - butan-2-ol, $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_3$
 - pentan-3-ol, $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{CH}_3$