



Organic Chemistry Revision Sheets

Alcohols | Elimination to form alkene (dehydration)

Reaction

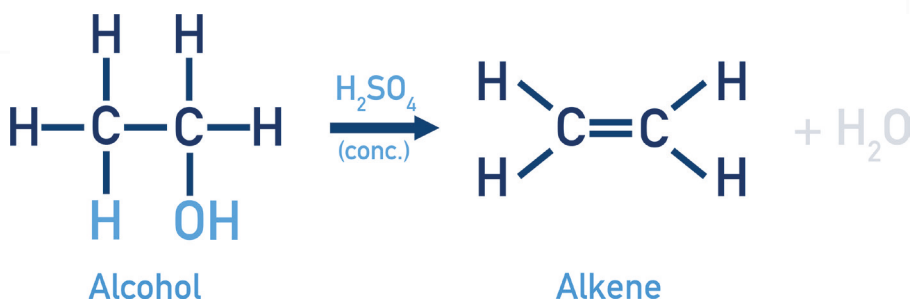
REACTANTS: Alcohol

CONDITIONS: Heat, Acid Catalyst (concentrated H_2SO_4 or concentrated H_3PO_4)

PRODUCT: Alkene

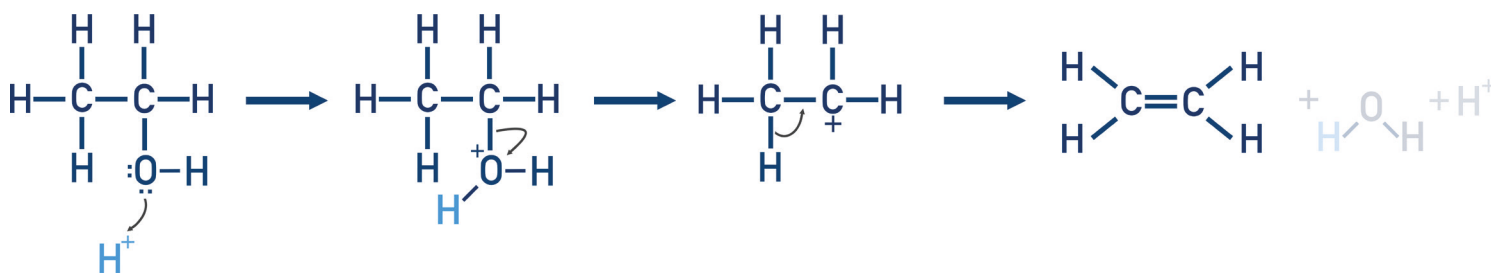
REACTION TYPE: Elimination Reaction, *dehydration*

REACTION:
(example of
ethanol)



Mechanism (simplified)

-OH group on alcohol accepts a H^+ ion from acid*, becoming $-\text{OH}_2^+$ (alcohol is 'protonated'). The carbon-oxygen bond breaks, forming a water molecule and a positively charged carbon atom (carbocation). A neighbouring carbon-hydrogen breaks, giving an electron pair to the carbocation, forming a carbon-carbon double bond. H^+ is released. H_2O is 'removed' from the alcohol - dehydration. ***Elimination reaction.***



Notes:

- The mechanism shown is a simplification as it is highly unlikely a primary carbocation would form (due to its instability as an intermediate).
- *It must be noted the H^+ ion comes from the concentrated acid (not shown in the mechanism), either H_2SO_4 or H_3PO_4 .*
- The removal of a water molecule makes this a **dehydration** reaction.