



Organic Chemistry Revision Sheets

Alkenes | Hydration (with H_2O in presence of acid, H^+)

Reaction

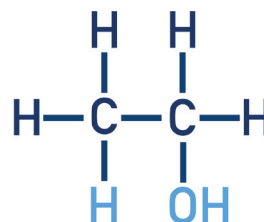
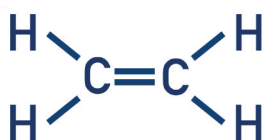
REACTANTS: Alkene and H_2O

CONDITIONS: Acid Catalyst

PRODUCT: Alcohol

REACTION TYPE: Electrophilic Addition, Acid Catalysed Hydration

REACTION:
(example of
ethene)

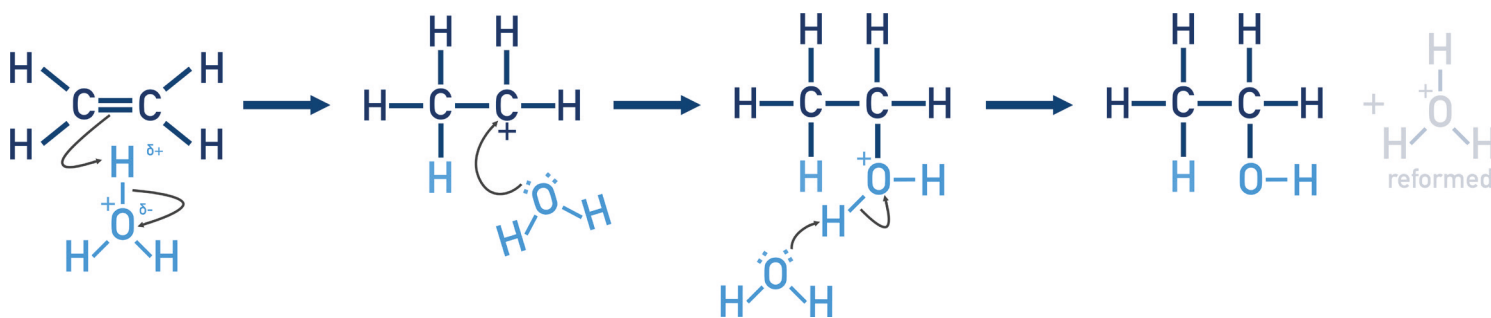


Alkene

Alcohol

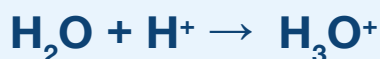
Mechanism

H_3O^+ acts as an electrophile because one of its $\text{H}^{\delta+}$ atoms accepts an electron pair from the carbon-carbon double bond, causing H_2O to form from the H_3O^+ . The carbon-carbon double bond breaks, forming a positively charged carbon (carbocation). The lone pair of electrons on an oxygen atom in H_2O form a bond with the carbocation. Another water molecule removes a H^+ from the $-\text{OH}_2^+$ group and H_3O^+ is reformed. H_2O is 'added' across the carbon-carbon double bond - hydration. **Addition reaction.**



Notes:

- The reaction must be carried out in acidic conditions to form a H_3O^+ (hydroxonium) ion.



- If a primary or secondary carbocation can be formed during the reaction, **the secondary carbocation will form more readily than the primary carbocation** - creating 'major' and 'minor' products*.
- The secondary carbocation is more stable due to an increased positive inductive effect from neighbouring alkyl chains.
- *The product mixture will contain more of the major than the minor product.