

Synthesis : dehydration of alcohols

(removal of -OH group and H atom)

Catalyst conc. H₂SO₄ / H₃PO₄

Condition heat / 170°C / 180°C

Mechanism Elimination reaction

Equation CH₃CH₂OH → CH₂=CH₂ + H₂O

(every product must be shown)

follow Zaitsev rule

major product : alkene where doubly bonded carbon have **greatest number of alkyl groups**

Addition of hydrogen halides

Reagent HCl / HBr / HI

Mechanism Electrophilic addition

Equation CH₃-CH=CH₂ + HBr → CH₃-CHBr-CH₃

(every product must be shown)

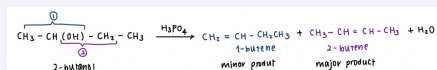
Condition room temperature

add hydrogen peroxide anti-Markovnikov rule

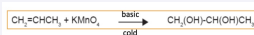
follow Markovnikov's rule

major product : halo group attach to doubly bonded carbon with **least number of H atoms**

Dehydration of alcohols



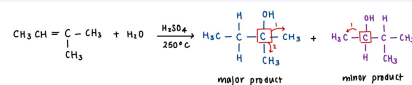
Oxidation / Baeyer test w/ KMnO₄



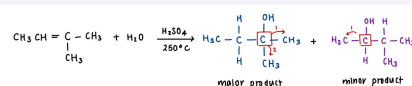
Halogenation



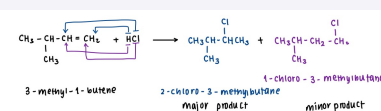
Hydration



Hydration



Addition of hydrogen halides



Polymerisation

n number of monomer join to form polymer

Catalyst Ziegler

Equation alkene → polyalkene

Hydration

Reagent H₂O

Condition 250°C

Catalyst dilute H₂SO₄

Equation CH₃CH=C(CH₃)-CH₃ + H₂O → CH₃CH₂C(OH)(CH₃)-CH₃

(every product must be shown)

produce electrophile H₃O⁺

follow Markovnikov's rule

major product : OH group attach to doubly bonded carbon with **least number of H atoms**

Synthesis : dehydrohalogenation

(removal of H atom and one halo group)

Reagent NaOH / KOH

Condition ethanol (as solvent), reflux

Equation CH₃CHCl-CH₂CH₃ + NaOH → CH₂=CHCH₂CH₃ + H₂O

(every product must be shown)

Synthesis : dehydrohalogenation (cont)

follow Zaitsev rule

major product : alkene where doubly bonded carbon have **greatest number of alkyl groups**

Halogenation

Reagent $\text{Cl}_2 / \text{Br}_2$

Catalyst $\text{CCl}_4 / \text{CH}_2\text{Cl}_2$

Mechanism Electrophilic addition

Equation $\text{CH}_2=\text{CH}_2 + \text{Br}_2 \rightarrow \text{CH}_2\text{BrCH}_2\text{Br}$

Observation brown colour of bromine disappears
green colour of chlorine disappears

Hydrogenation

Reagent H_2

Catalyst Ni / Pt / Pd

Condition heat / 200°C

Equation $\text{CH}_2=\text{CH}_2 + \text{H}_2 \rightarrow \text{CH}_3\text{CH}_3$

Oxidation / Baeyer test

Step 1

Reagent O_2

Catalyst silver

Condition 450 K

Equation $\text{CH}_2=\text{CH}_2 \rightarrow \text{C}_2\text{H}_4\text{O}$ (epoxyethane)

Step 2

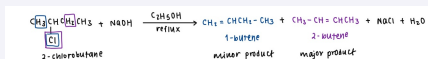
Equation $\text{C}_2\text{H}_4\text{O}$ (epoxyethane) $\rightarrow \text{CH}_2(\text{OH})-\text{CH}_2(\text{OH})$

Reagent H_2O

Catalyst dilute H_2SO_4

Condition 60°C

Dehydrohalogenation



Oxidation / Baeyer test

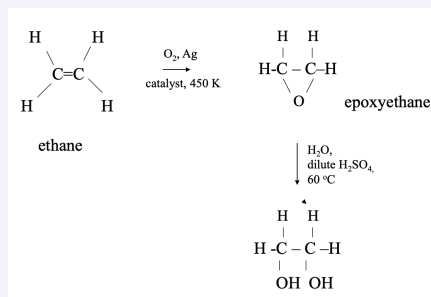
Reagent KMnO_4

Condition cold condition, basic medium

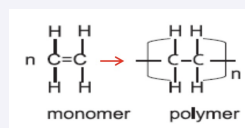
Equation $\text{CH}_2=\text{CHCH}_3 + \text{KMnO}_4 \rightarrow \text{CH}_2(\text{OH})-\text{CH}(\text{OH})\text{CH}_3$

Observation purple colour of KMnO_4 disappears
brown colour precipitate formed

Oxidation / Baeyer test w/ silver catalyst



Polymerisation



By bubblysoul

cheatography.com/bubblysoul/

Not published yet.

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