IMPORTANT QUESTION 1.

DEGREE-I (HONS.)

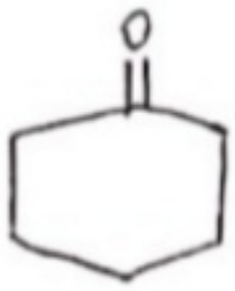
24/11/2020

Predict the product giving the mechanism of the following :-

Revision

ⓐ $CH_3 - CH = CH_2 \xrightarrow{HBr}$

ⓑ  $\xrightarrow[\text{Conc. } H_2SO_4]{\text{Conc. } HNO_3}$

ⓒ  $\xrightarrow[NaOH]{HCN}$

ⓓ $(CH_3)C - Cl \xrightarrow{aq.\ KOH}$

SOLUTION

ⓐ $H_3C - CH = CH_2 \xrightarrow{HBr} H_3C - \underset{\underset{Br}{|}}{CH} - CH_3$

2-bromopropane (major)

+

$H_3C - CH_2 - CH_2 - Br$ Minor

* This is an electrophilic addition reaction.

Addition to unsymmetrical alkene follow Markownikov's rule.

Mechanism

$HBr \longrightarrow H^+ + Br^-$

$H_3C - CH = CH_2$

$\downarrow H^+$

$H_3C - \overset{\oplus}{C}H - CH_3$

2° Carbocation

(More stable)

$\downarrow Br^-$

$H_3C - \underset{\underset{Br}{|}}{CH} - CH_3$

(Major Product)

$H_3C - CH_2 - \overset{\oplus}{C}H_2$

1° carbocation

(Less stable)

$\downarrow Br^-$

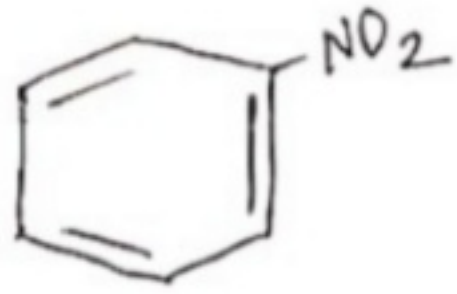
$H_3C - CH_2 - CH_2 - Br$

(Minor Product)

(b)

Benzene

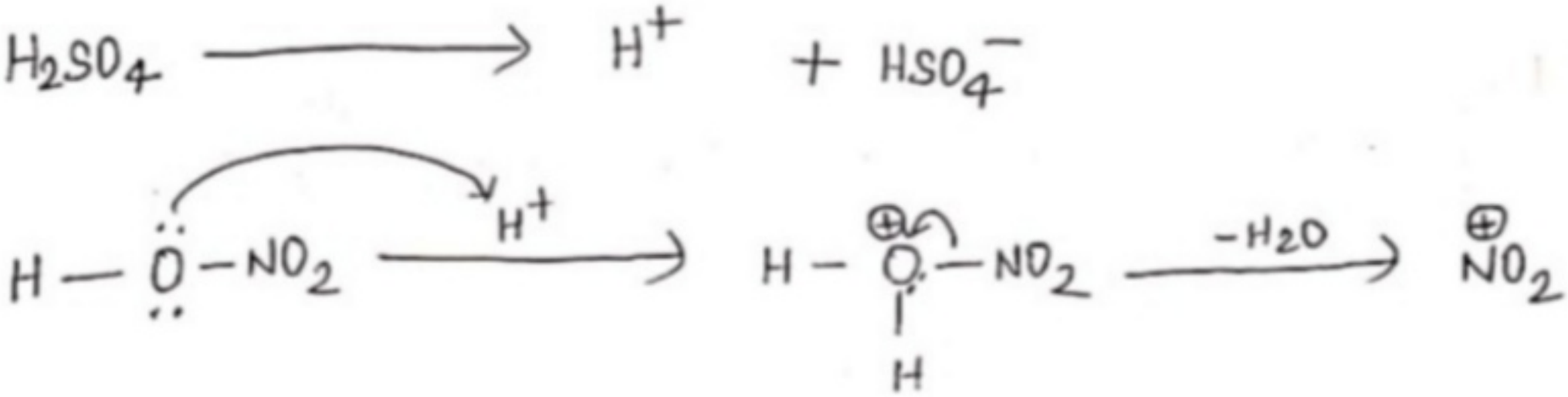
$\xrightarrow[\text{Conc. } H_2SO_4]{\text{Conc. } HNO_3}$

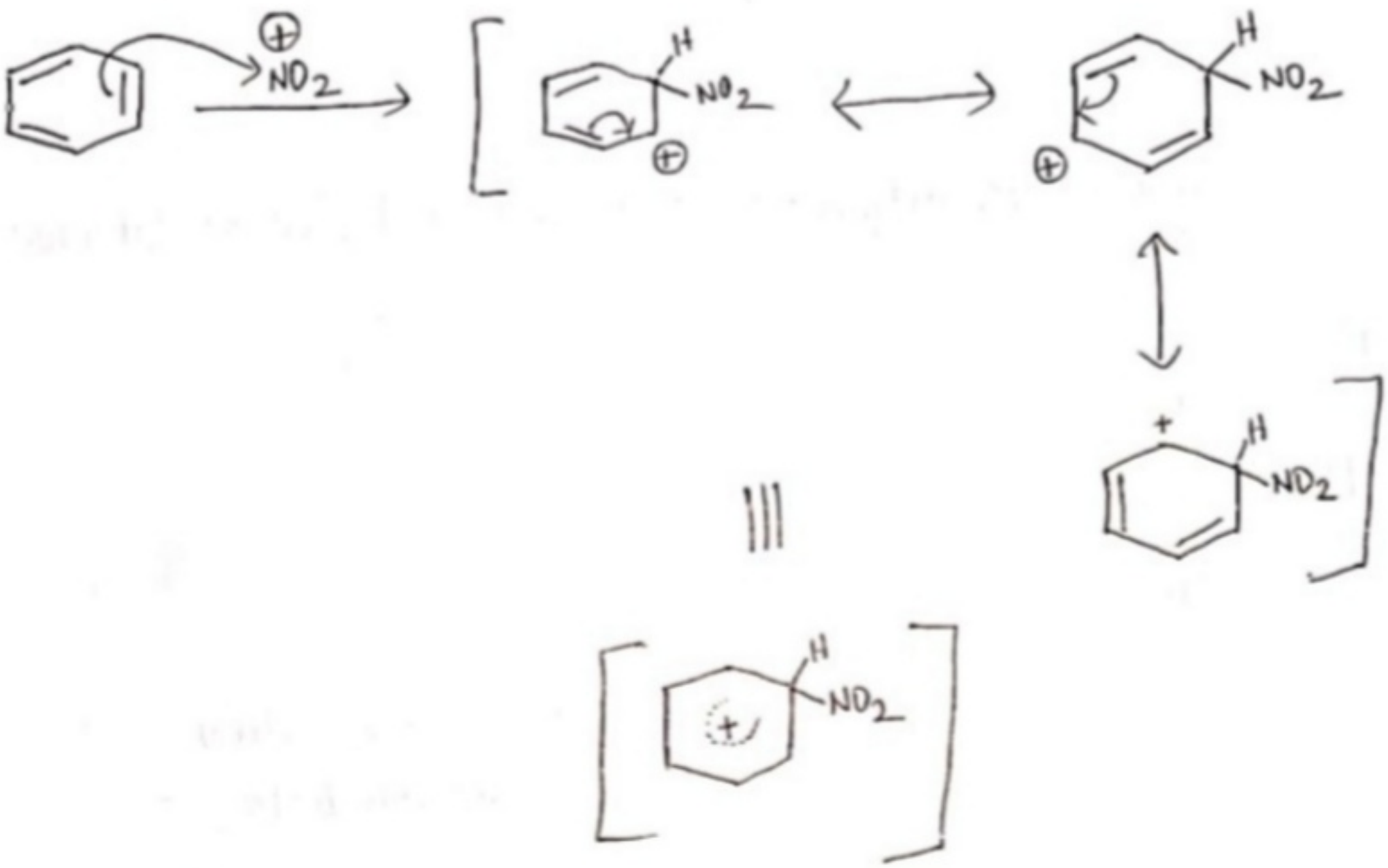


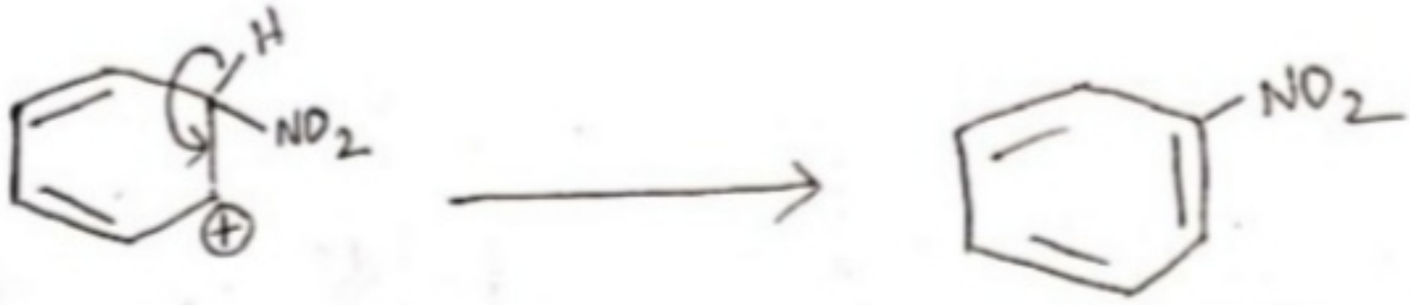
Nitrobenzene

Mechanism

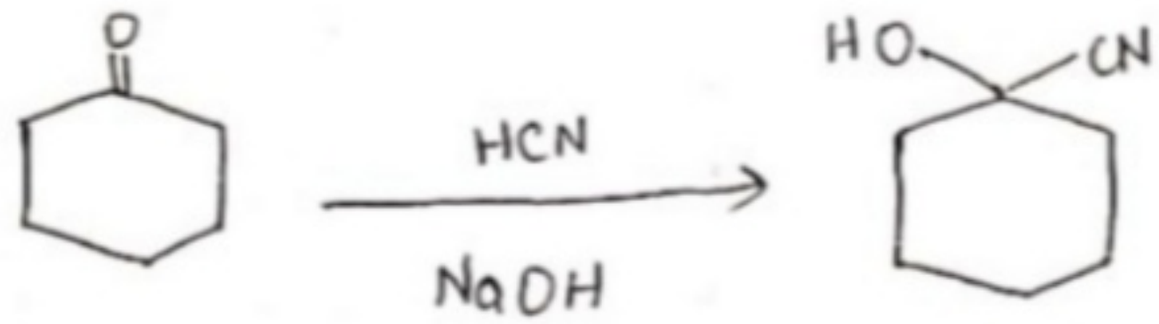
3.







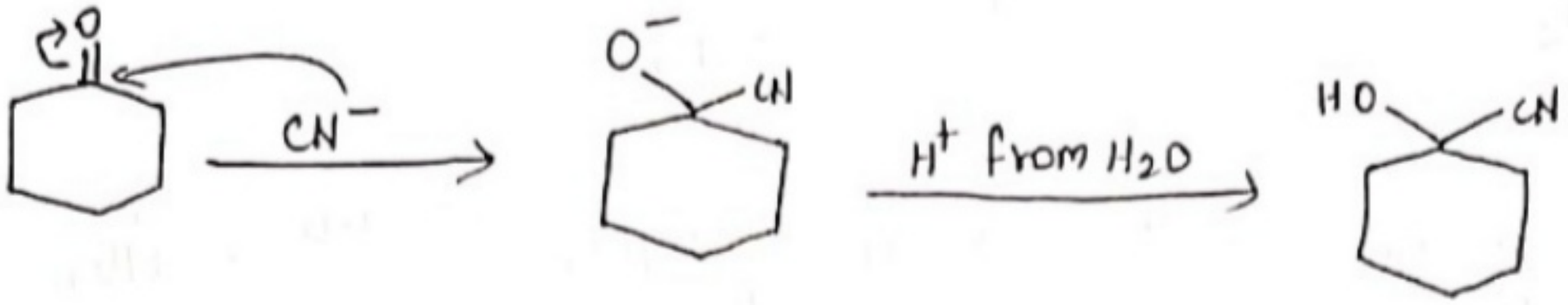
Nitrobenzene

© 

Mechanism

4.

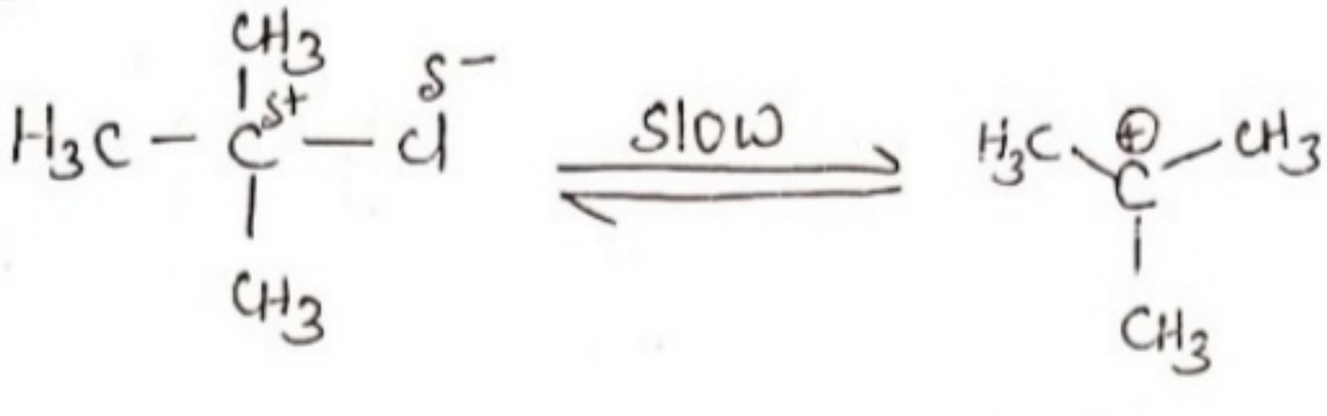
$OH^- + H^+ \longrightarrow H_2O$



(d) $(H_3C)Cl \xrightarrow{aq.\ KOH} (H_3C)_3C-OH$

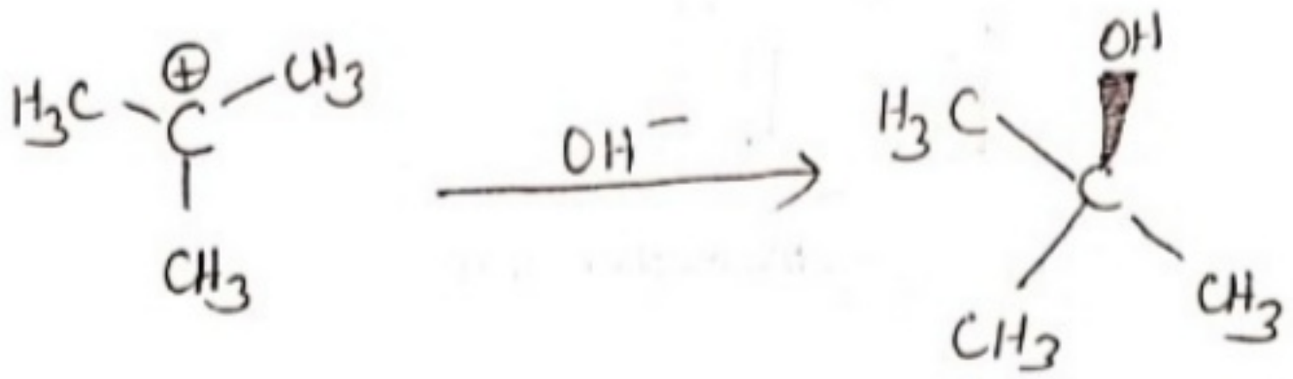
This reaction is Nucleophilic Substitution and follow S_N1 mechanism.

Step: 1



Planar carbocation intermediate

Step: 2



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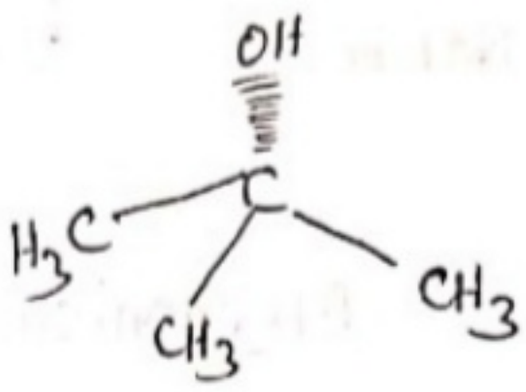

In this reaction racemisation of configuration takes place hence, product will be racemic mixture.

Completed..