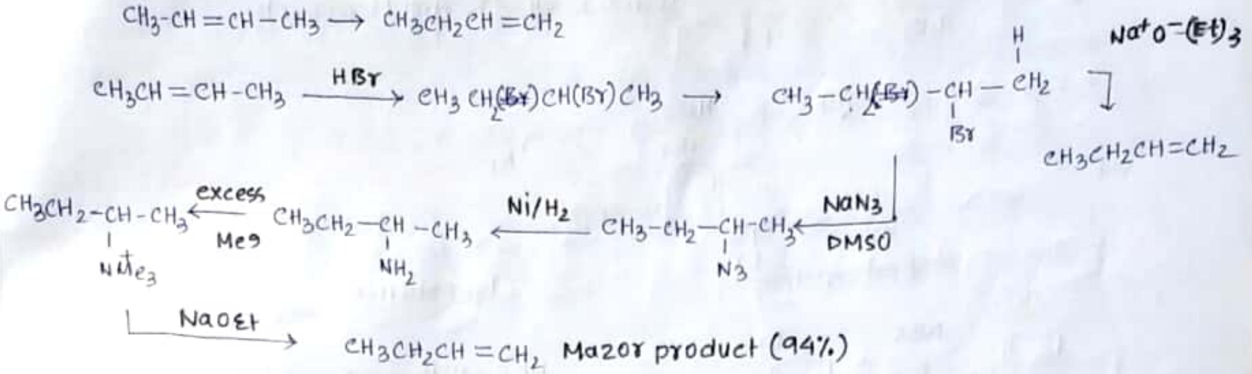
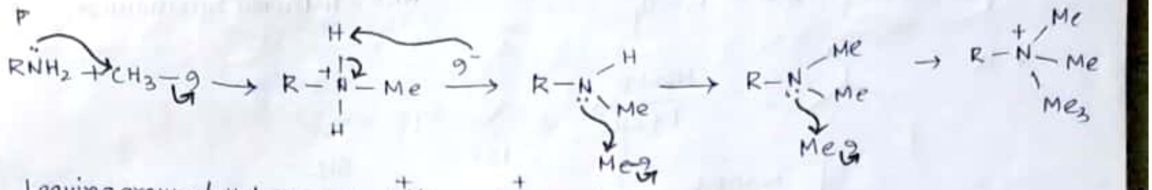
i. 2 butene → 1 butene

$CH_3-CH=CH-CH_3 \rightarrow CH_3CH_2CH=CH_2$





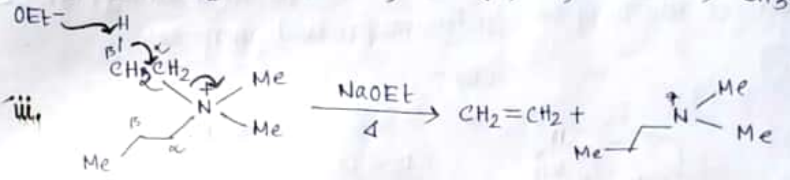
Leaving group of Hofmann :- $\overset{+}{N}Me_3$, $-\overset{+}{S}R_2$, -F

ii. 1 butene → 2 butene

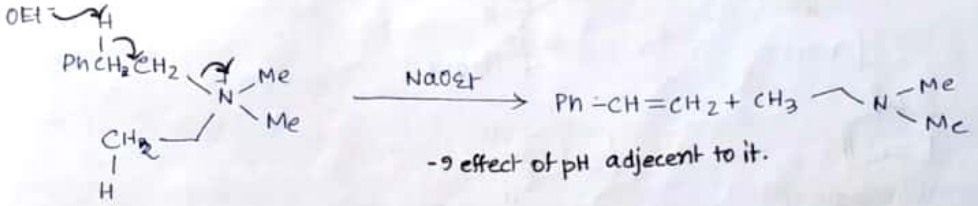
$CH_3CH_2CH=CH_2 \longrightarrow CH_3CH=CHCH_3$

$CH_3CH_2CH=CH_2 \xrightarrow{HBr} CH_3CH_2CH(Br)CH_3 \xrightarrow{Alk.\ KOH} CH_3CH=CHCH_3$

iii.

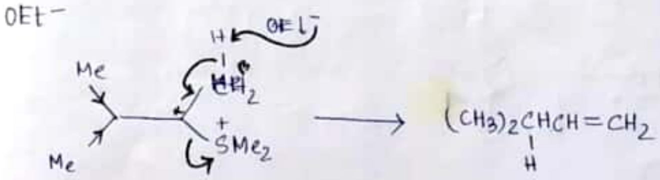


iv.

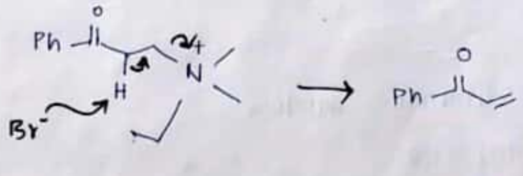


-I effect of pH adjecent to it.

v.

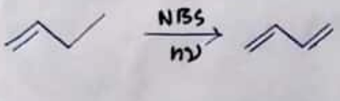


vi.

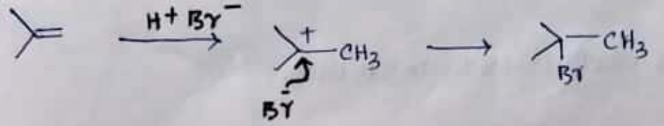


vii.

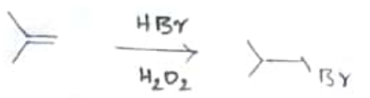
viii.



ix.

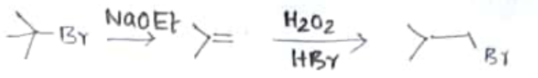


Marconicof reaction

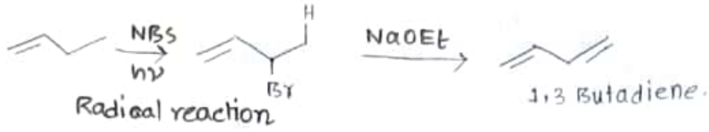


(Peroxide effect) Anti Merconicof

vii.

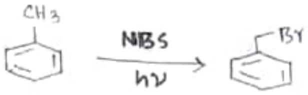


viii.



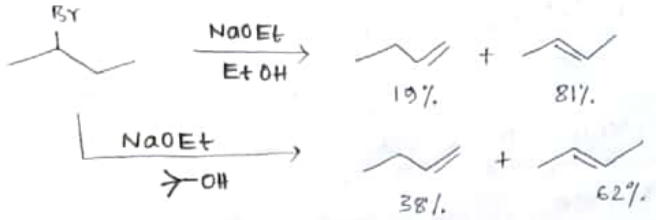
Radical reaction

1,3 Butadiene.



NBS - N-Bromo Succinamide

ix.

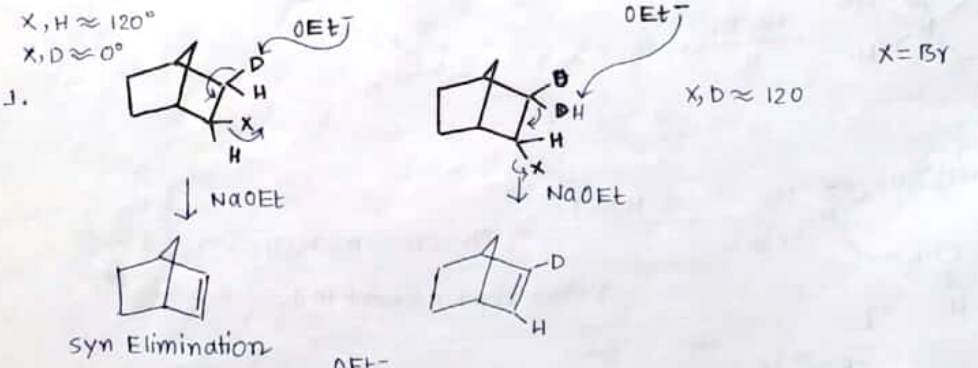


$NaOEt + EtOH \rightleftharpoons \cancel{H}\ EtOH + OEt^{-}$

$NaOEt + \succ\!-OH \rightleftharpoons HOEt^{+} + \succ\!-O^{-}$ large size of attacking base

With increasing the size of attacking base hofmann product increases.

1.

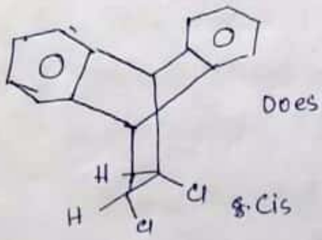


syn Elimination

2.

H, H ≈ 120

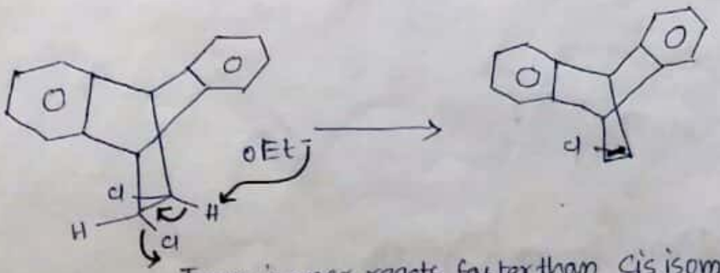
3.



Cis

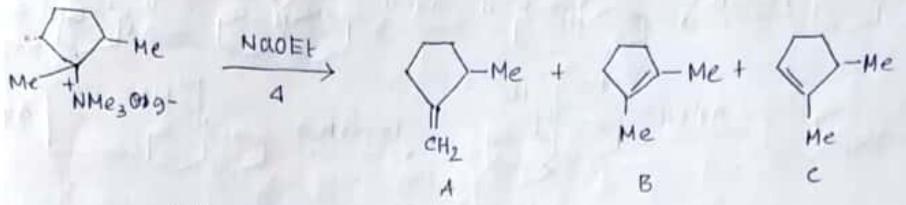
Does not occur elimination reaction

H, Cl ≈ 120°

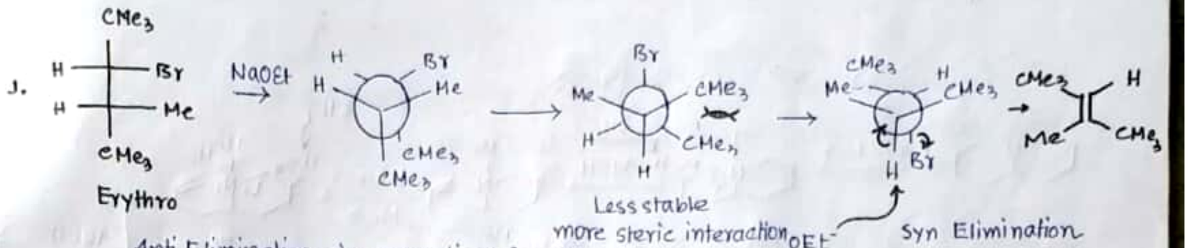


Trans isomer reacts faster than Cis isomer.

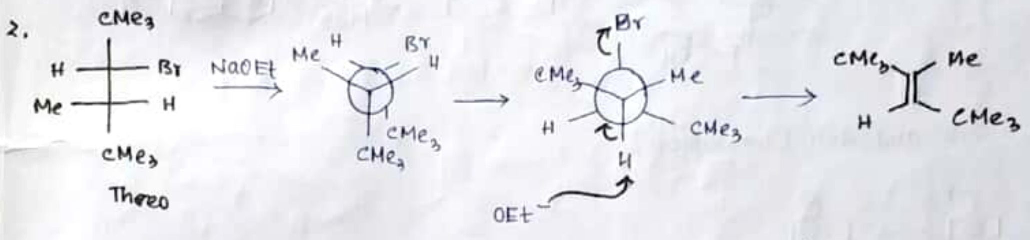
The deuterated Norbornyl system gives 99% of the product containing no deutorium. Similar result are obtained with other leaving groups and with bicyclo [2,2,2] system. In this cases exo -X group can not acheive a dihedral angle of 180° with the endo β-hydrogen atom because of the rigid structure of the molecule. The dihedral angle here is about 120°. These leaving groups preferrs syn elimination with dihedral angle of 0° to anti elimination with an angle of 120°.



Acidity order: A > C > B

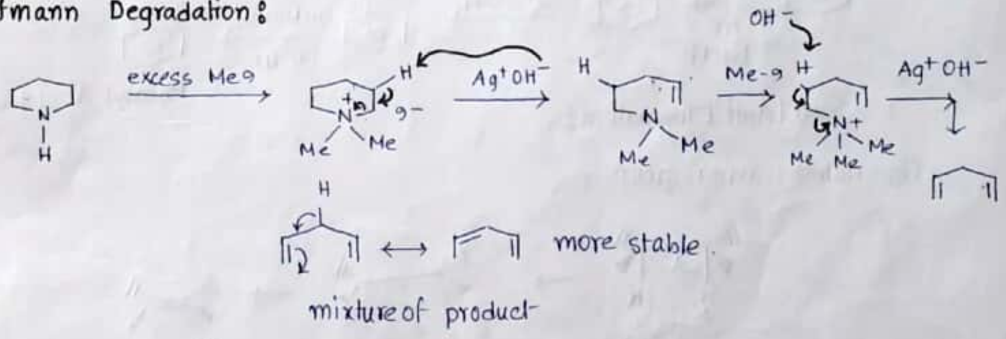


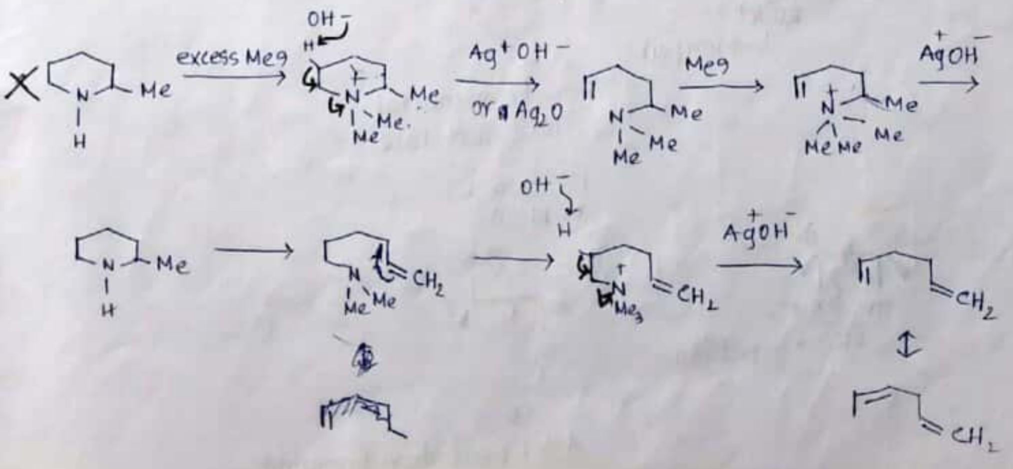
Anti Elimination via energetically unfavourable conformation.



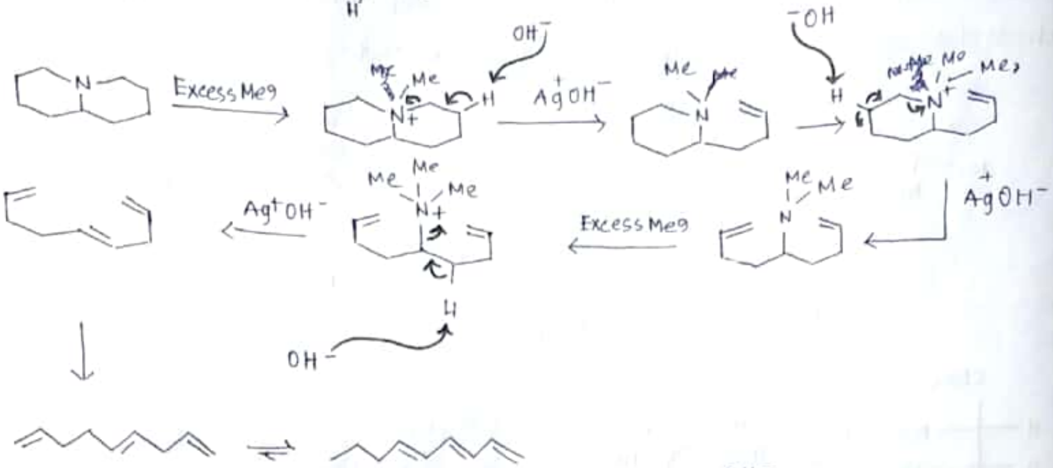
Anti Elimination via energetically favourable conformation.

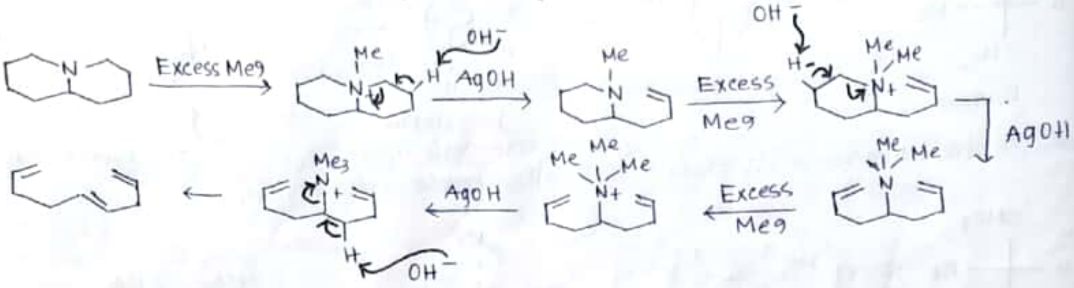
Hofmann Degradation:



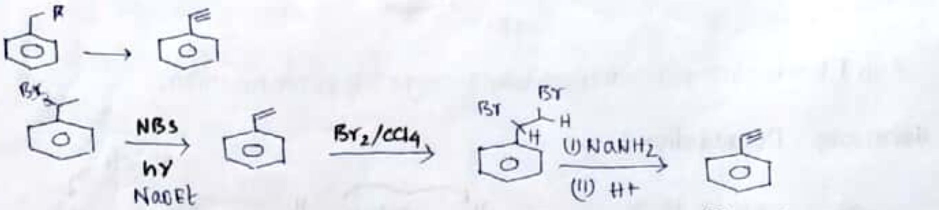


Rathin Jana
Organic chem
Sem-2 cc-4





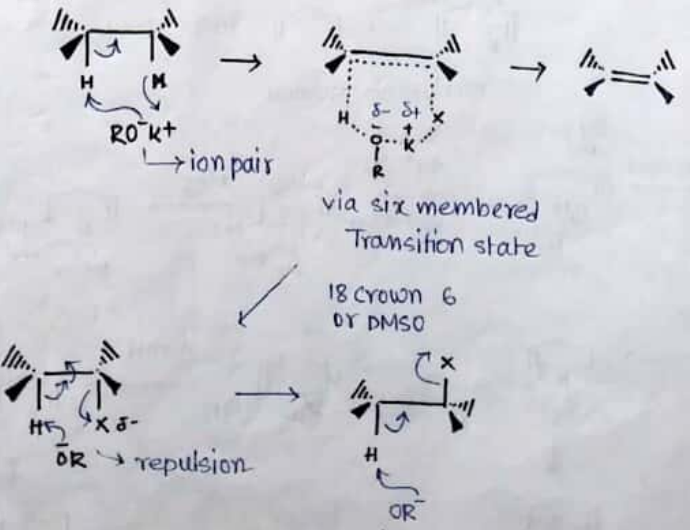
Syn and Anti Elimination:



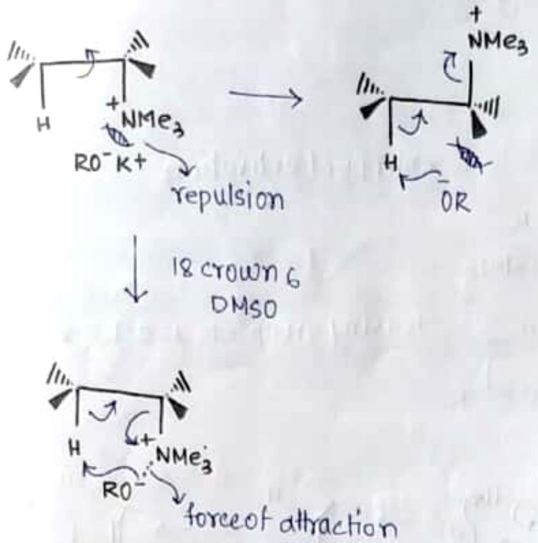
Phenyl Acetelene.

Syn / Anti Elimination:

For Nutral Leaving group :



Anti Elimination favourable.



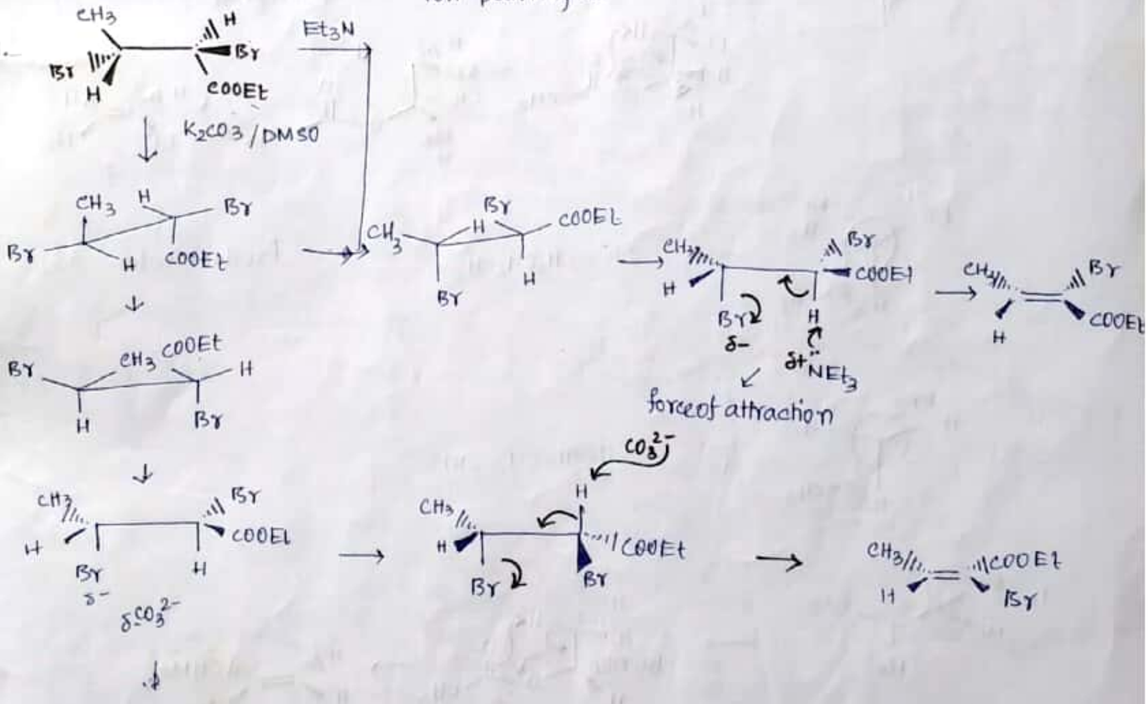
The factors that ditermines whether syn or Anti Elimination are predominent are very complex.

One factor whether the base is free or present as Ion pair

Ion pair promotes the syn Elimination for nutral leaving group. This effect can be explained by the transition state in which anion function acts as a base and the cation assist in the departure of leaving group But when crown ethar it used it traps the cation so syn/anti ratio decreases.

However, for the positive charge leaving group the effect is reversed. Here ion pair increases the anti elimination. In this case relatively free base $\bar{OR}$ can be attracked to the leaving grp, putting it in a favourable position for attack on the β-H atom, while ion pairing would reduces the attraction.

1.



2.