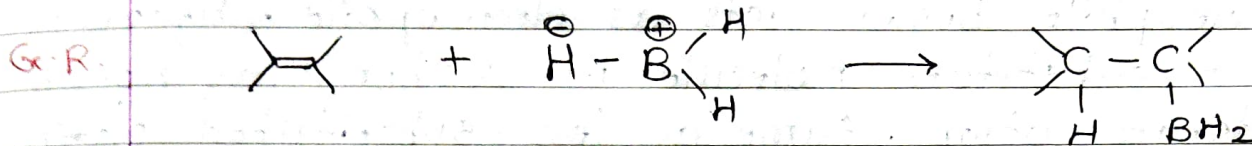
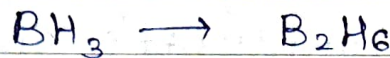


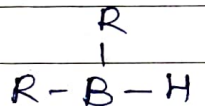
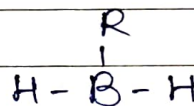
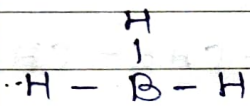
UNIT - II

(A) Hydroboration

Organoborane reagent BH_3 it gives dimer form B_2H_6



statement \rightarrow Addition of BH_2 to unsaturated alkene or alkynes with borane or diborane is called as Hydroboration. Resulting product are known as alkyl borane. The degree of hydroboration depends upon no. of hydrogen on boron & nature of hydrogen.



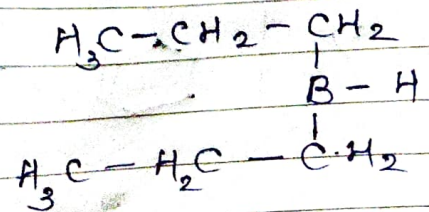
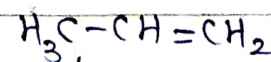
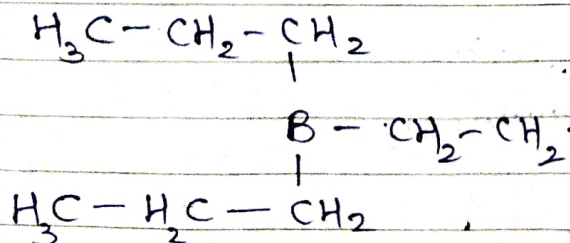
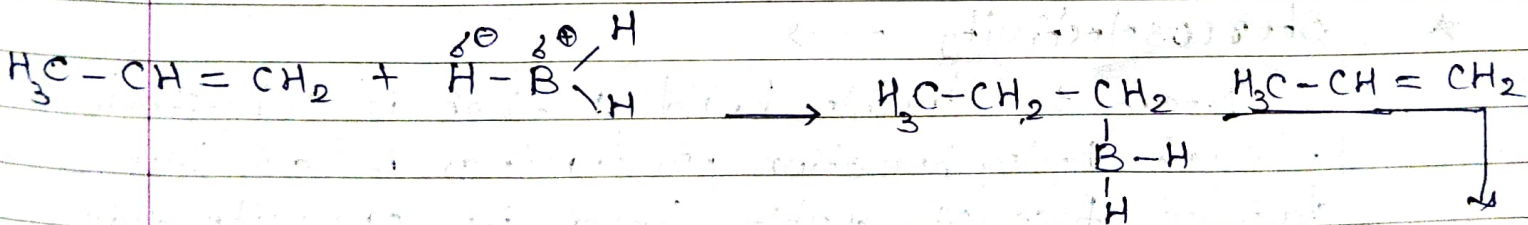
3 step hydroboration

2 step

1 step

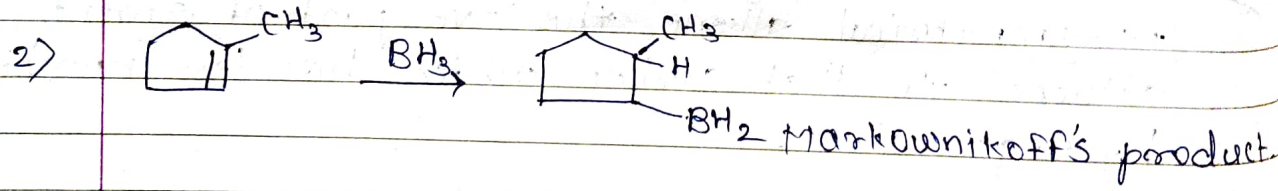
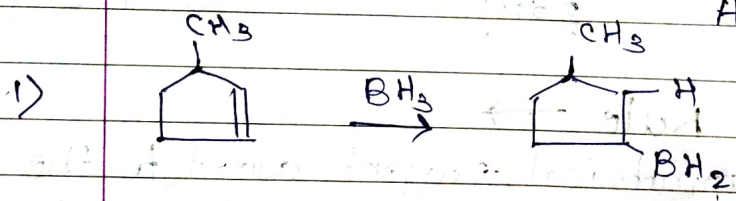
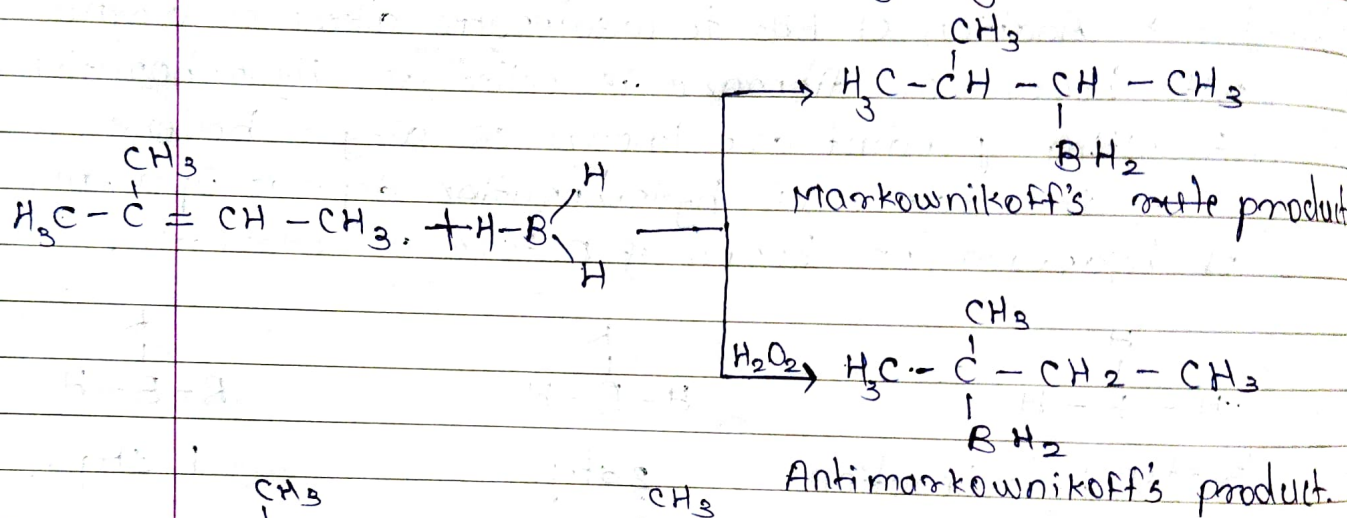
* Markownikoff's Rule \rightarrow

When unsymmetrical reagent added to the unsymmetrical alkene the -ve part of reagent attached to that carbon which has less number of hydrogen atom.



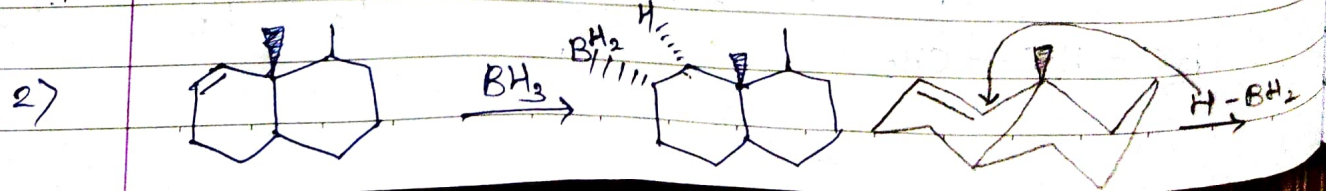
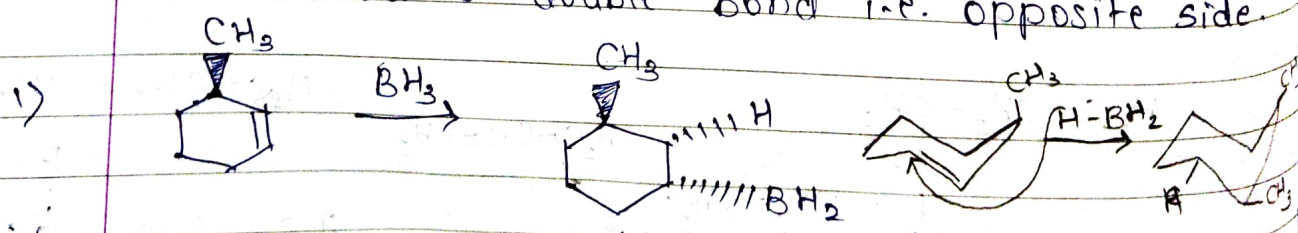
*** Regioselectivity →**

In case of unsymmetrical olefins hydroboration of are to Markownikoff's rule hydrogen acts as nucleophile boron acts as electrophile. Hydrogen more substituted molecule i.e. carbon less no. of hydrogen atom. Same as less substituted olefins that carbon more no. of hydrogen atom.



*** Stereoselectivity →**

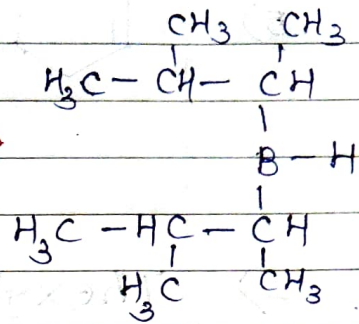
Near to double bond if there is substitution present hydroboration predominantly act less crowded face of double bond i.e. opposite side.



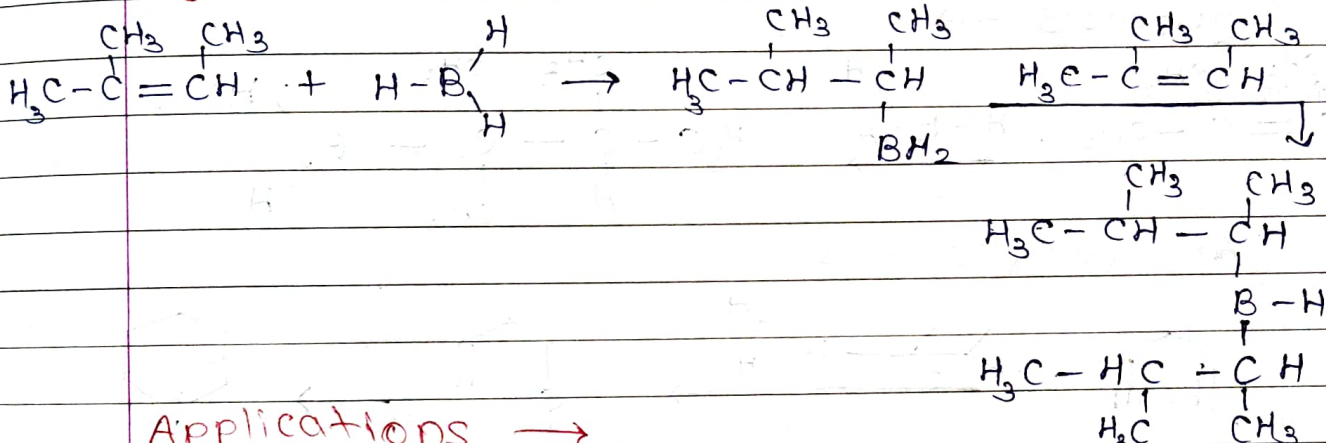
* Types of Borane

1) Diisooamyl borane → structure →

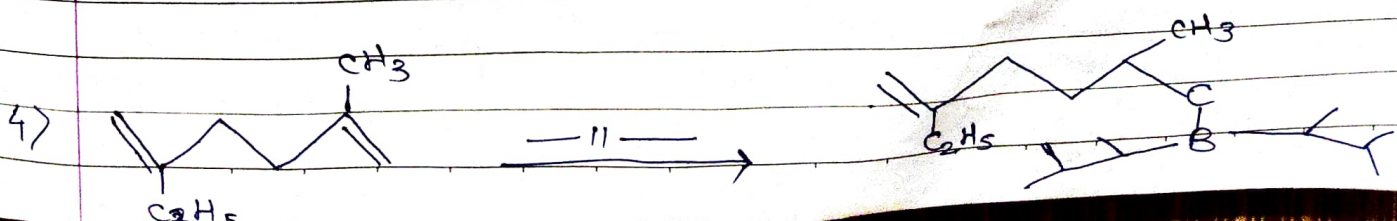
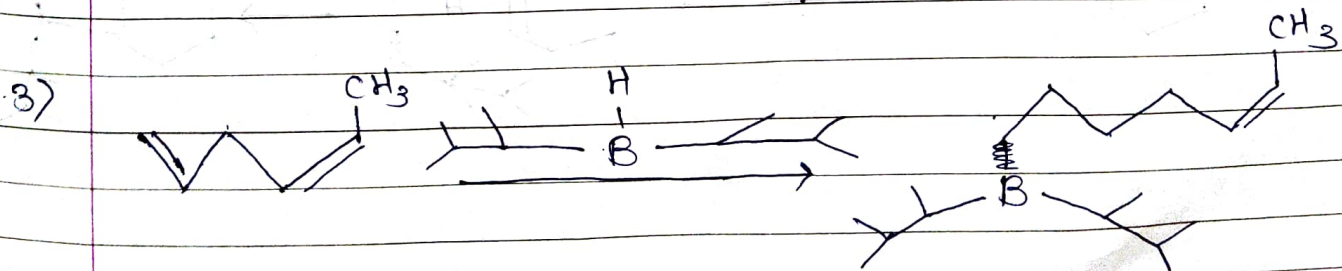
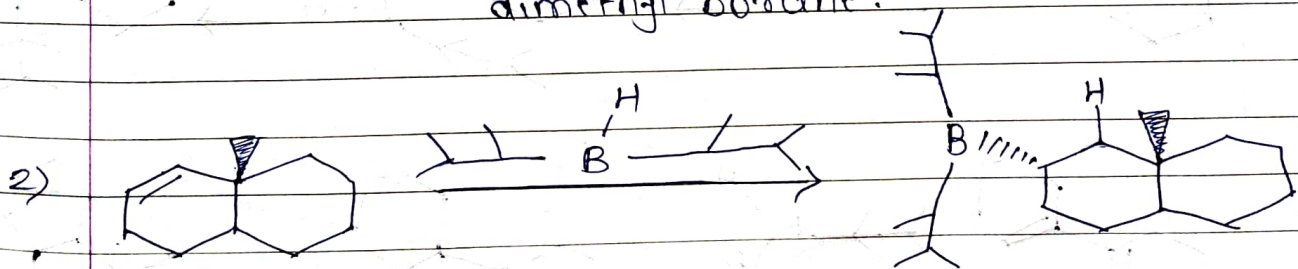
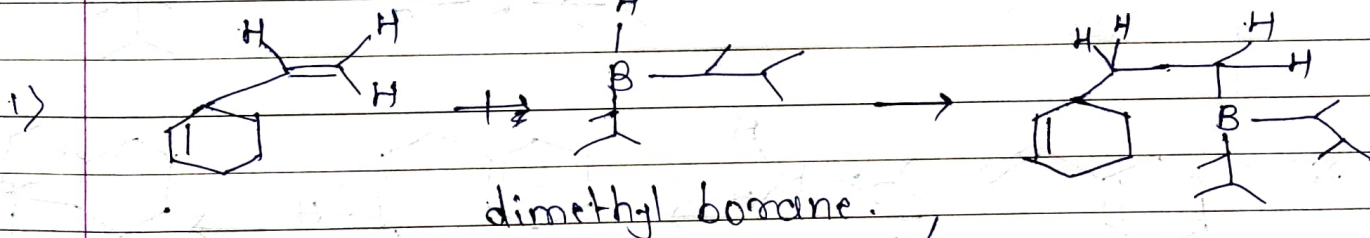
Diisooamyl borane due to the large size mainly used for stereo selective hydroboration.

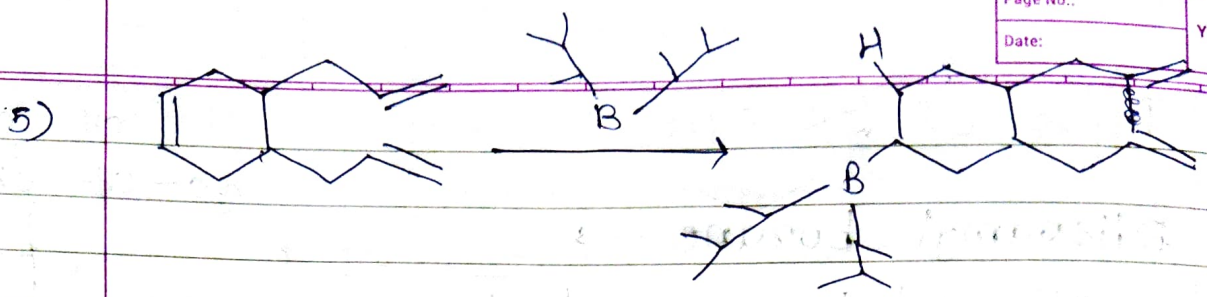


Synthesis →

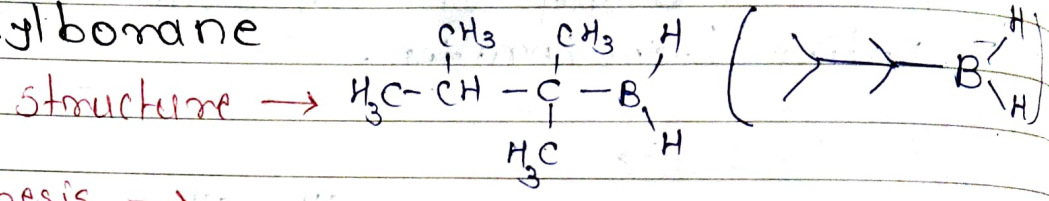


Applications →

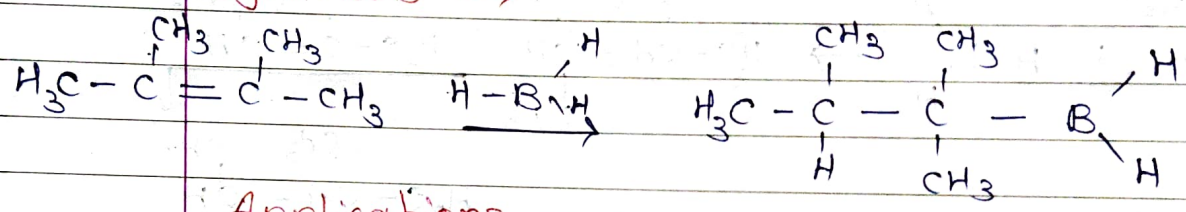




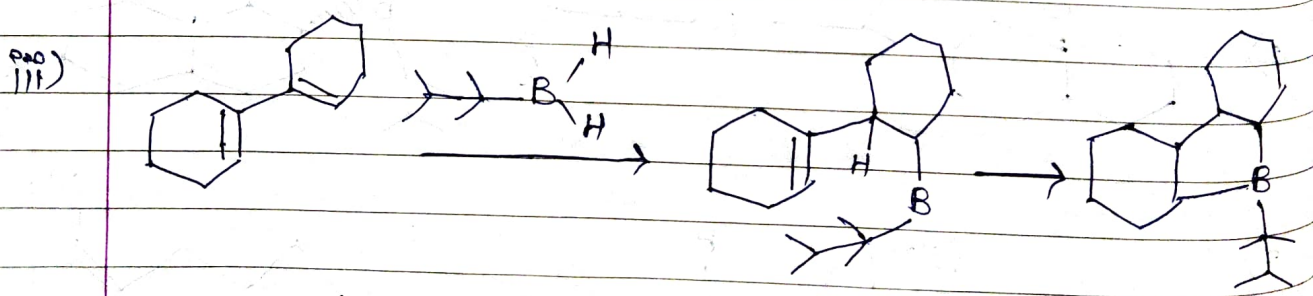
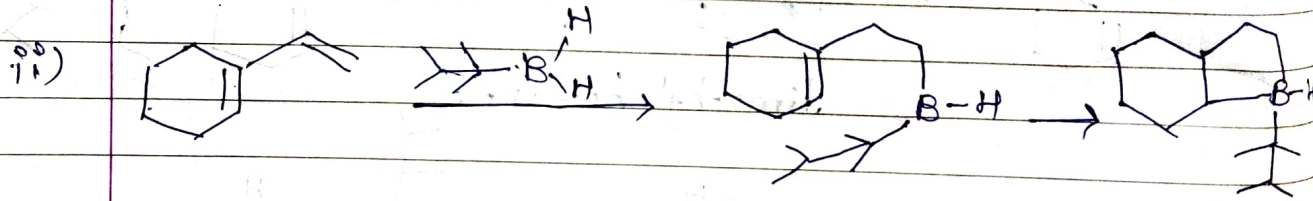
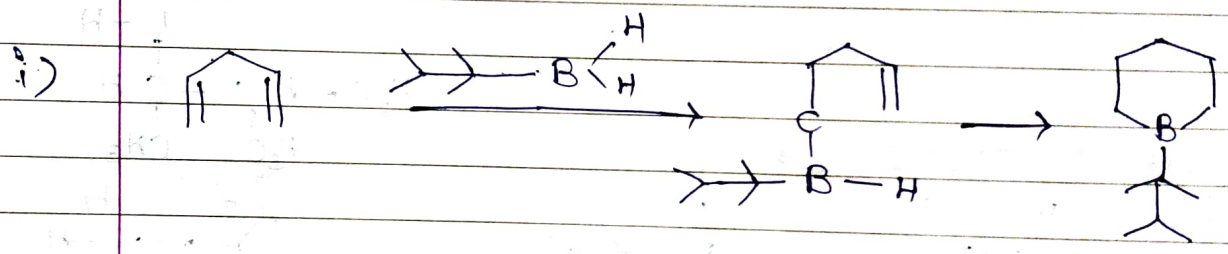
2) **Thexylborane**



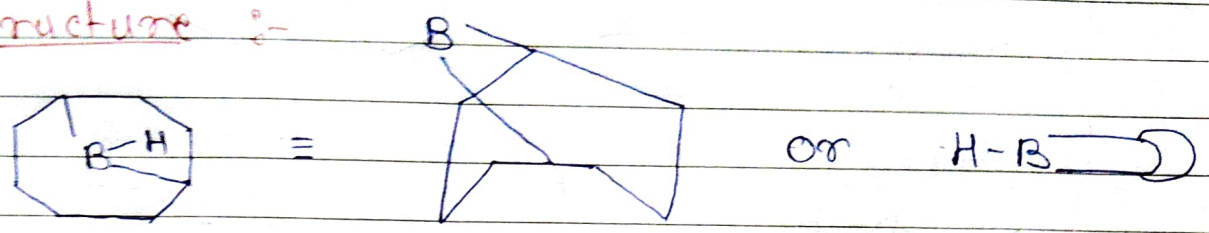
Synthesis \rightarrow



Applications \rightarrow

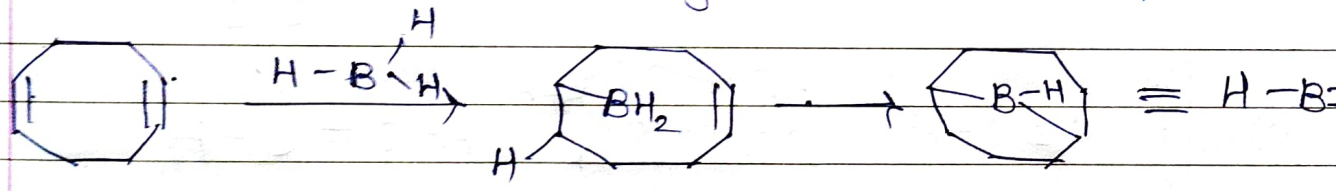


3) 9-borabicyclo [3,3,1] nonane [9BBN]
structure :-



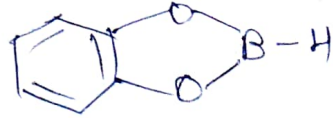
- i) It is organoborane compound
- ii) It is highly selective
- iii) stable hydro-borating agent
- iv) Anti-Markownikoff's hydration of alkane & alkene.
- v) It is colourless solid.

Synthesis → 9BBN is prepared by re^d of 1-5 cyclo octadiene & Borane usually in ethereal solⁿ.

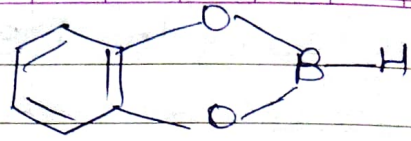


Applications →

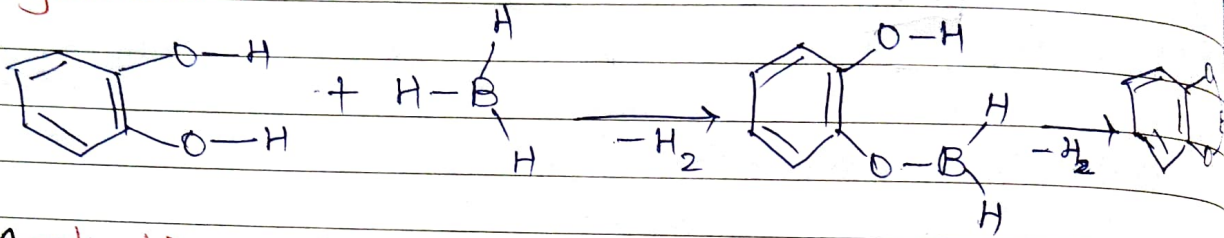
- 1)
- 2)
- 3)
- 4)



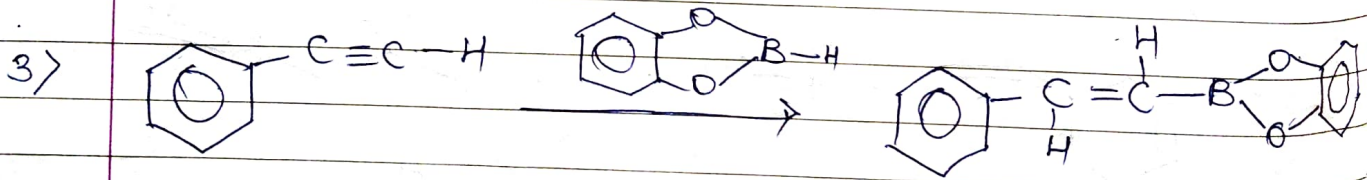
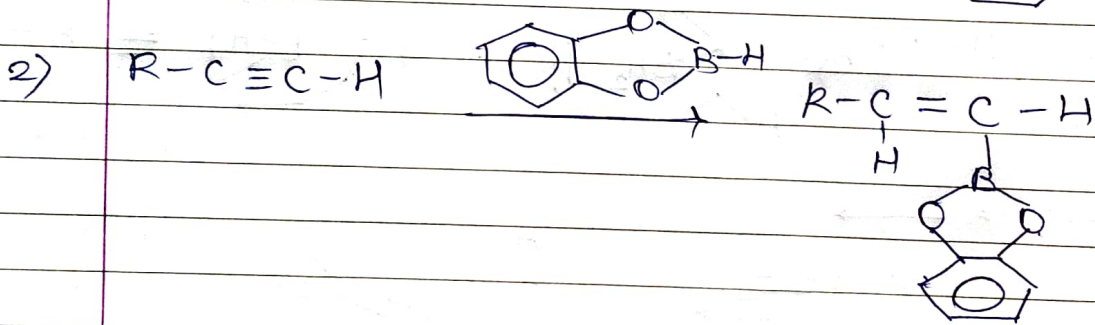
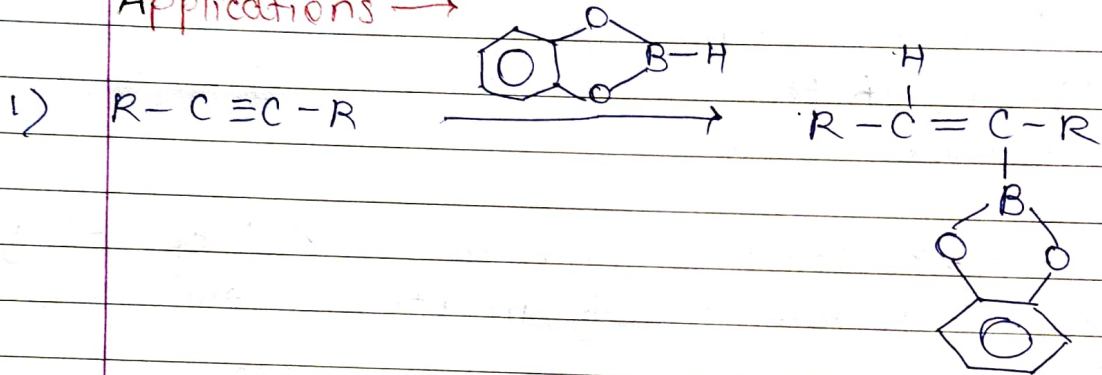
< 4 > Catatol borane
 structure →



Synthesis

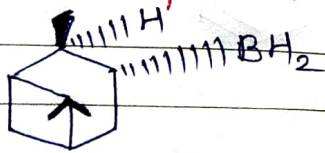


Applications →

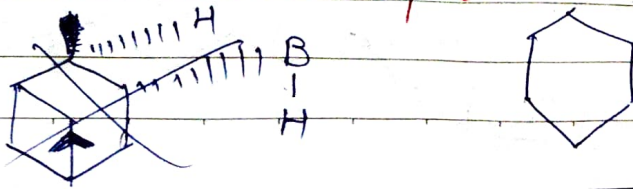


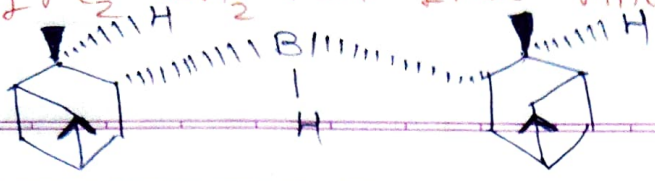
< 5 > Chiral borane

1) IPC - Ipcso Pino Comphanyl Borane

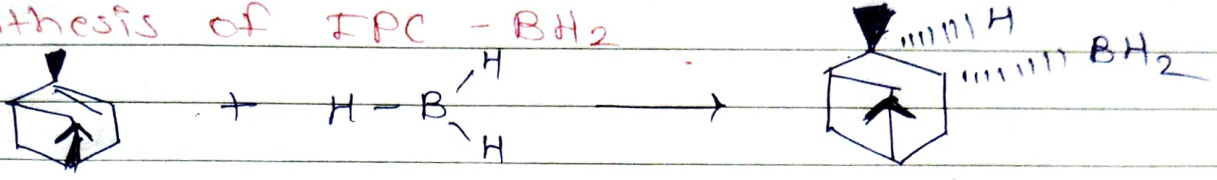


2) ~~IPC₂ BH₂ : Df Ipcso Pino comphanyl Borane~~

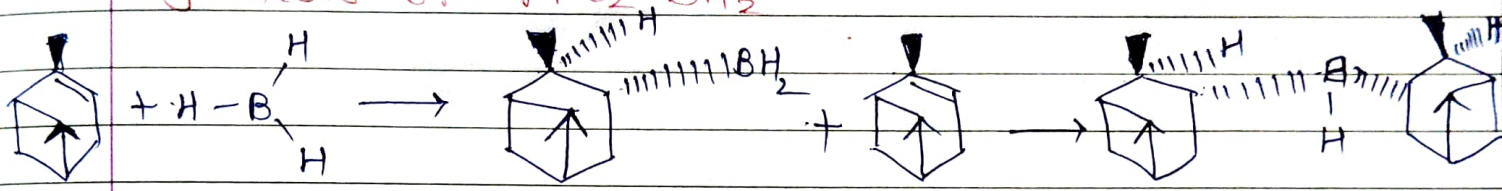




Synthesis of IPC - BH₂



Synthesis of IPC₂BH₂



Applications →

