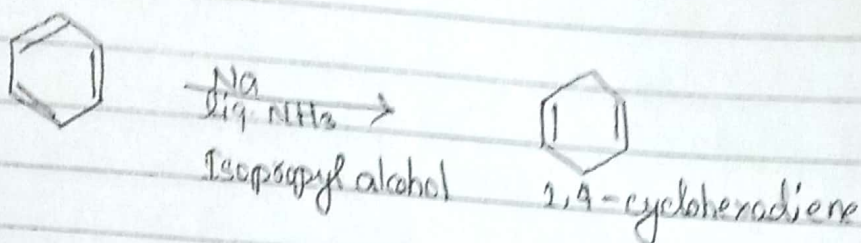


Birch Reduction

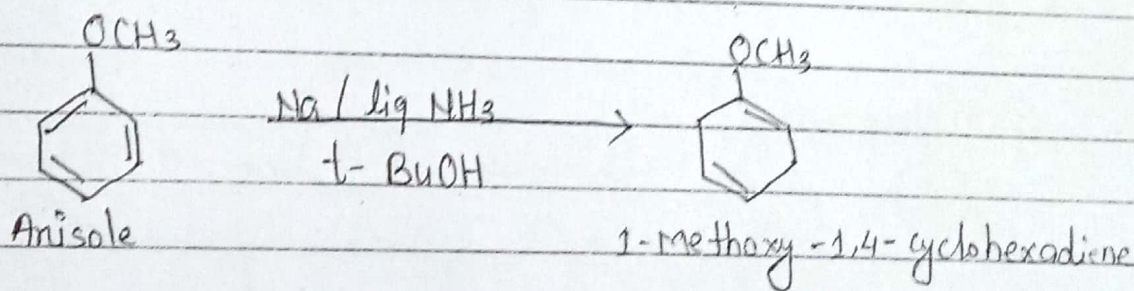
Aromatic rings are reduced by alkali metal (Li, Na or K) in liquid ammonia in presence of alcohol. In this case 1,4-addition of hydrogen takes place and a non-conjugated cyclohexadiene is produced. This reduction is called Birch reduction.



Alcohol is used to supply proton because ammonia is not so much acidic for this purpose.

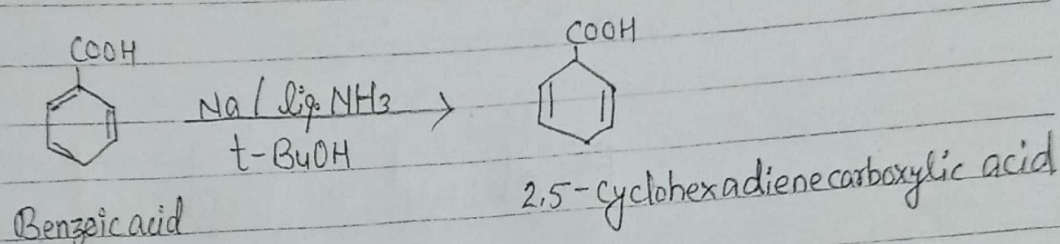
Reaction is influenced by substituted group on the aromatic ring.

⇒ In presence of electron ~~releasing~~ releasing group on aromatic ring, the functional group goes on non-reducible position.



* t-BuOH ⇒ Tertiary butyl alcohol.

1) In presence of electron withdrawing group, functional group goes on reduced position.

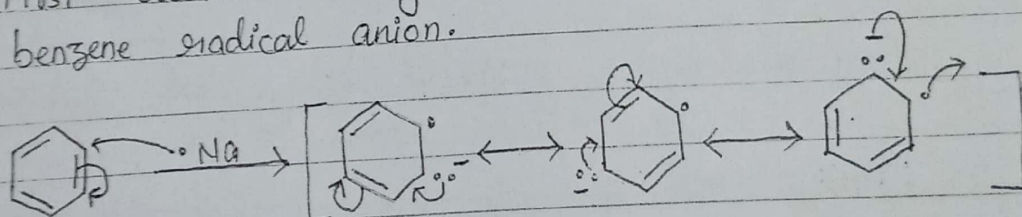


* Mechanism of Birch Reduction :-

A sequence of electron transfer from alkali metal and proton transfer from alcohol takes place.

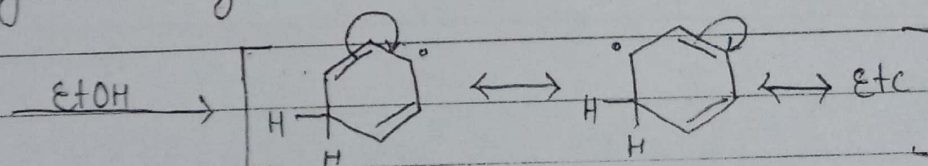
STEP 1 :-

First electron transfer produce a delocalized benzene radical anion.



STEP 2 :-

Proton transfer from alcohol takes place, produce a cyclohexadienyl.



STEP 3 :-

Transfer of another electron leads to the formation of a delocalised cyclohexadienyl anion and protonation of this produces 1,4-cyclohexadiene.

