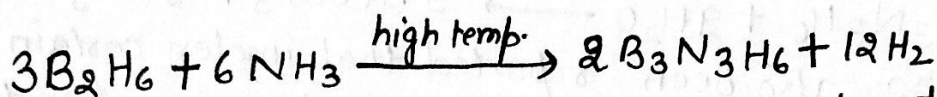


## Borazine

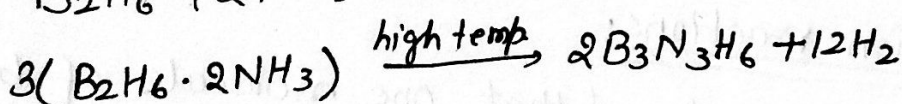
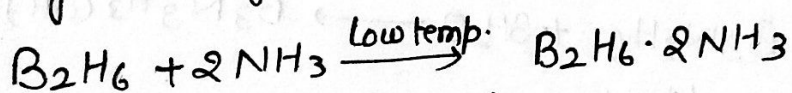
### Preparation:

i) Heating a mixture of  $B_2H_6$  and  $NH_3$

This compound is formed when diborane and ammonia are reacted at high temperature in 1:2 molar ratio.

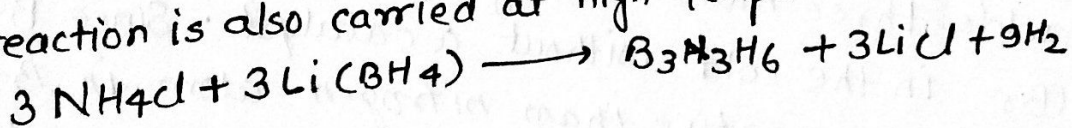


Diammoniate of diborane formed at low temperature by mixing  $B_2H_6$  and  $NH_3$  may also be converted to borazine by heating at high temperature.



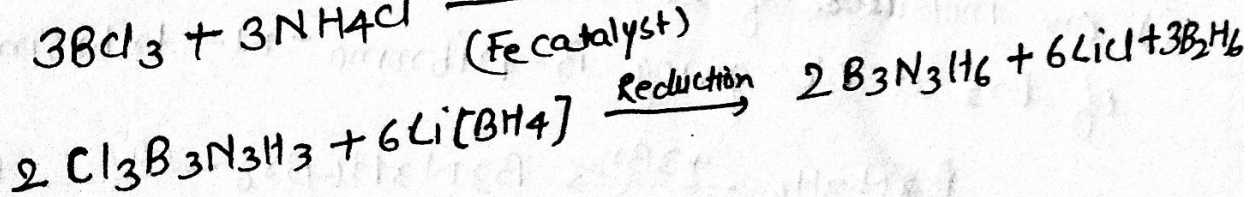
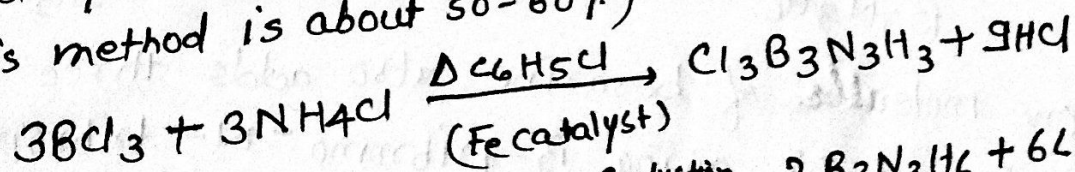
ii) Reaction of  $Li(BH_4)$  on  $NH_4Cl$

This reaction is also carried at high temperature.



iii) Heating  $BCl_3$  with  $NH_4Cl$ .

When  $BCl_3$  is heated with  $NH_4Cl$  in chlorobenzene ( $C_6H_5Cl$ ) in presence of a catalyst (eg. Fe, Ni, Co etc) at  $133^\circ C$ , trichloroborazine is obtained which on being reduced by  $Li(BH_4)$  in polyether gives borazine. (yield by this method is about 50-60%)



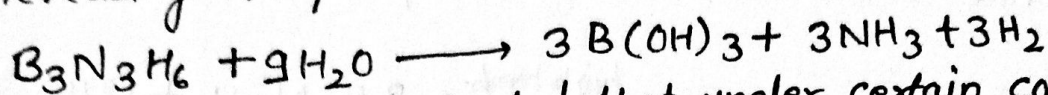
## Properties

Borazine is a colourless and volatile liquid.

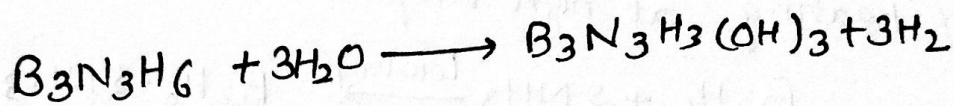
Its important chemical properties are:

### A) Hydrolysis

- (i) It is slowly hydrolysed by water to produce boric acid,  $H_3BO_3$ , ammonia and  $H_2$  which is favoured by increasing temperature.

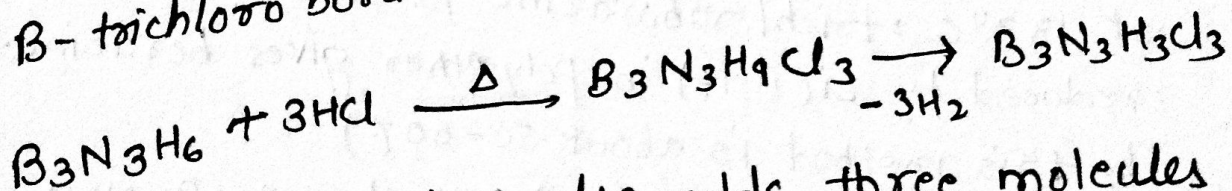


- (ii) It has also been reported that under certain conditions borazine reacts with three molecules of water to produce trihydroxyborazine  $(OH)_3B_3N_3H_3$ , in which OH groups are attached with B atoms.

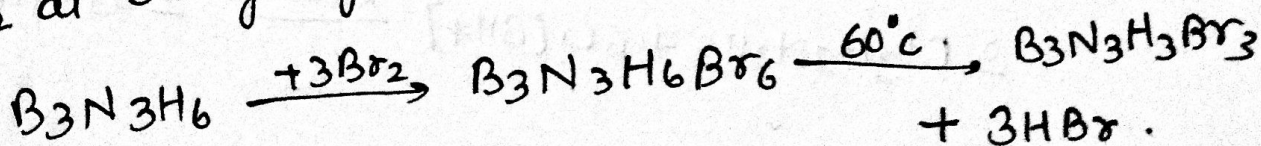


### B) Addition reactions:

- i) It has been found that one molecule of borazine adds three molecules of  $H_2O$ ,  $CH_3OH$ ,  $CH_3I$ ,  $HCl$  or  $HBr$  in the cold without a catalyst. Since B-atom is less electronegative than nitrogen atom in B-N bond, more negative groups or atoms of these molecules are generally attached with boron. HCl derivative of this compound when heated at  $50-100^\circ C$  loses  $H_2$  molecules to give B-trichloro borazine (Cl-atoms attached to B-atoms)



- ii) One molecule of borazine also adds three molecules of  $Br_2$  at  $0^\circ C$  giving B-tribromo-N-tribromoborazine.



C Hydrogenation

Borazine can be converted to cyclotriborazine,  $B_3N_3H_{12}$  as shown below:-

