NCERT Solutions for Class-XI Chemistry

Chapter-11
NCERT Chemistry Class 11

1. Discuss the pattern of variation in the oxidation states of
(i) B to Tl and (ii) C to Pb.

1. **(i) B to Tl**

The electric configuration of group 13 elements is $ns^2\ np^1$. Therefore, the most common oxidation state exhibited by them should be +3. However, it is only boron and aluminum which practically show the +3 oxidation state. The remaining elements, i.e., Ga, In, Tl, show both the +1 and +3 oxidation states. On moving down the group, the +1 state becomes more stable. For example, Tl (+1) is more stable than Tl (+3). This is because of the inert pair effect. The two electrons present in the s-shell are strongly attracted by the nucleus and do not participate in bonding. This inert pair effect becomes more and more prominent on moving down the group. Hence, Ga (+1) is unstable, In (+1) is fairly stable, and Tl (+1) is very stable.

Group 13 element	Oxidation state
B	+3
Al	+3
Ga, In, Tl	+1, +3

The stability of the +3 oxidation state decreases on moving down the group.

(ii) C to Pb

The electronic configuration of group 14 elements is $ns^2\ np^2$. Therefore, the most common oxidation state exhibited by them should be +4. However, the +2 oxidation state becomes more and more common on moving down the group. C and Si mostly show the +4 state. On moving down the group, the higher oxidation state becomes less stable. This is because of the inert pair effect. Thus, although Ge, Sn, and Pb show both the +2 and + 4 states, the stability of the lower oxidation state increases and that of the higher oxidation state decreases on moving down the group.

Group 14 element	Oxidation state
C	+4
Si	+4
Ge, Sn, Pb	+2, +4

stability of +2 state increase →

C Si Ge Sn Pb

→ stability of +4 state decrease

2. How can you explain higher stability of BCl_3 as compared to $TlCl_3$?

2. BCl_3 is quite stable. Because there is absence of d- and f-electrons in boron three valence electrons ($2s^2\ 2p_{x1}$) are there for bonding with chlorine atom. In Tl the valence

s-electron ($6s^2$) are experiencing maximum inert pair effect. Thus, only $6p^1$ electron is available for bonding. Therefore, BCl_3 is stable but $TlCl_3$ is comparatively unstable.

3. Why does boron trifluoride behave as a Lewis acid?

3. The electronic configuration of boron is ns^2, np^1. It has three valance shell electrons. It can form only three covalent bonds. It means Boron has only 6 electrons and its octet is not complete, boron needs 2 more electrons to complete its octet. In BF_3, its octet is incomplete. Hence it is an electron deficient molecules so it acts as a Lewis acid.

4. Consider the compounds, BCl_3 and CCl_4. How will they behave with water? Justify.

4. Being a Lewis acid, BCl_3 readily undergoes hydrolysis. Boric acid is formed as a result.

$BCl_3 + 3H_2O \rightarrow 3HCl + B(OH)_3$

CCl_4 completely resists hydrolysis. Carbon does not have any vacant orbital. Hence, it cannot accept electrons from water to form an intermediate. When CCl_4 and water are mixed, they form separate layers.

$CCl_4 + H_2O \rightarrow$ No reaction

5. Is boric acid a protic acid? Explain.

5. Boric acid is a Lewis acid, it is not a protonic acid.

Boric acid accepts electrons from hydroxyl ion of H_2O molecule.

$B(OH)_3 + 2HOH \rightarrow [B(OH)_4]^- + H_3O^+$

6. Explain what happens when boric acid is heated.

6. On heating boric acid around 370 K, it converts to metaboric acid (HBO_2). If we continue the heating process, it becomes boric oxide.

$$H_3BO_3 \xrightarrow[370\,K]{\Delta} HBO_2 \xrightarrow[\text{red hot}]{\Delta} B_2O_3$$

7. Describe the shapes of BF_3 and BH_4^-. Assign the hybridisation of boron in these species.

7. The hybridisation of Boron in BF_3 and BH_4^- is sp^2 and sp^3 respectively.

8. Write reactions to justify amphoteric nature of aluminium.

8. A substance is called amphoteric if it displays characteristics of both acids and bases. Aluminium dissolves in both acids and bases, showing amphoteric behaviour.

(i) $2Al_{(s)} + 6HCl_{(aq)} \longrightarrow 2Al^{3+}_{(aq)} + 6Cl^-_{(aq)} + 3H_{2(g)}$

(ii) $2Al_{(s)} + 2NaOH_{(aq)} + 6H_2O_{(l)} \longrightarrow 2Na^+\left[Al(OH)_4\right]^-_{(aq)} + 3H_{2(g)}$

9. What are electron deficient compounds? Are BCl_3 and $SiCl_4$ electron deficient species? Explain.

9. Electron deficient species are those in which the central atom in their molecule has the tendency to accept one or more electron pairs. They are also known as Lewis acid.

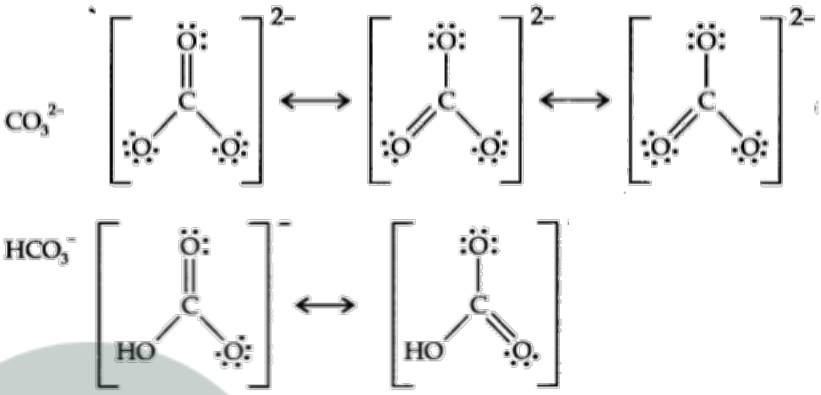
BCl_3 and $SiCl_4$ both are electron deficient species. Since, in BCl_3, B atom has only six electrons. Therefore, it is an electron deficient compound.

In $SiCl_4$ the central atom has 8 electrons but it can expand its covalency beyond 4 due to the presence of d-orbitals.

Thus, $SiCl_4$ should also be considered as electron-deficient species.

10. Write the resonance structures of CO_3^{2-} and HCO_3^-.

10.



11. What is the state of hybridisation of carbon in (a) CO_3^{2-} (b) diamond (c) graphite?

11. The state of hybridisation of carbon in:

(a) CO_3^{2-}

C in CO_3^{2-} is sp^2 hybridised and is bonded to three oxygen atoms.

(b) Diamond

Each carbon in diamond is sp^3 hybridised and is bound to four other carbon atoms.

(c) Graphite

Each carbon atom in graphite is sp^2 hybridised and is bound to three other carbon atoms.

12. Explain the difference in properties of diamond and graphite on the basis of their structures.

12. The difference in the properties of carbon and graphite-

Diamond	Graphite
It has a crystalline structure	Layered structure
Each carbon atom is sp^3 hybridised	Carbon has sp^2 hybridisation
Made up of tetrahedral units	Planner in geometry
Act as an electrical insulator	Good conductor of electricity
C-C bond length is 154 pm	C-C bond length is 141.5 pm

13. Rationalise the given statements and give chemical reactions:

"¢ Lead (II) chloride reacts with Cl_2 to give $PbCl_4$.

"¢ Lead (IV) chloride is highly unstable towards heat.

”¢ Lead is known not to form an iodide, PbI_4.

13. (a) Lead belongs to group 14 of the periodic table. The two oxidation states displayed by this group is +2 and +4. On moving down the group, the +2 oxidation state becomes more stable and the +4 oxidation state becomes less stable.

This is because of the inert pair effect. Hence, $PbCl_4$ is much less stable than $PbCl_2$. However, the formation of $PbCl_4$ takes place when chlorine gas is bubbled through a saturated solution of $PlCl_2$.

$$PbCl_{2(s)} + Cl_{2(g)} \longrightarrow PbCl_{4(l)}$$

(b) On moving down group IV, the higher oxidation state becomes unstable because of the inert pair effect. Pb(IV) is highly unstable and when heated, it reduces to Pb(II).

$$PbCl_{4(l)} \xrightarrow{\Delta} PbCl_{2(s)} + Cl_{2(g)}$$

(c) Lead is known not to form PbI_4. Pb (+4) is oxidising in nature and I-is reducing in nature. A combination of Pb(IV) and iodide ion is not stable. Iodide ion is strongly reducing in nature. Pb(IV) oxidises I^- to I^2 and itself gets reduced to Pb(II).

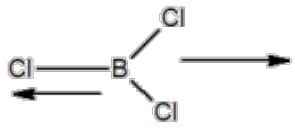
$$PbI_4 \longrightarrow PbI_2 + I_2$$

14. Suggest reasons why the B–F bond lengths in BF_3(130 pm) and BF_4^- (143 pm) differ.

14. In BF_3 ‘B’ is sp^2 hybridised and in BF_4^- ‘B’ is sp^3 hybridised. Thus, the difference in bond length is due to the state of hybridisation.

15. If B-Cl bond has a dipole moment, explain why BCl_3 molecule has zero dipole moment.

15. Due to differences in electronegativities of Boron and chlorine, the partial charges develop in B-Cl bond. BCl_3 is a non-polar compound. This molecule is trigonal planner shape (symmetrical) and we know that dipole moment is a vector quantity. In fig. we can see that, they can cancel out each other.



16. Aluminium trifluoride is insoluble in anhydrous HF but dissolves on addition of NaF. Aluminium trifluoride precipitates out of the resulting solution when gaseous BF_3 is bubbled through. Give reasons.

16. Since, anhydrous HF is covalent compound and weak acid due to high bond dissociation energy.

AlF_3 does not dissolve in HF.

Whereas NaF is ionic compound.

$3NaF + AlF_3 \rightarrow Na_3[AlF_6]$

$Na_3[AlF_6] + 3BF_3(g) \rightarrow AlF_3 + 3Na + [BF]^-$

17. Suggest a reason as to why CO is poisonous.

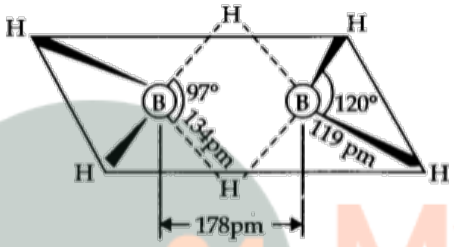
17. Carbon monoxide is highly-poisonous because of its ability to form a complex with haemoglobin. The CO-Hb complex is more stable than the O_2-Hb complex. The former prevents Hb from binding with oxygen. Thus, a person dies because of suffocation on not receiving oxygen. It is found that the CO-Hb complex is about 300 times more stable than the O_2-Hb complex.

18. How is excessive content of CO_2 responsible for global warming?

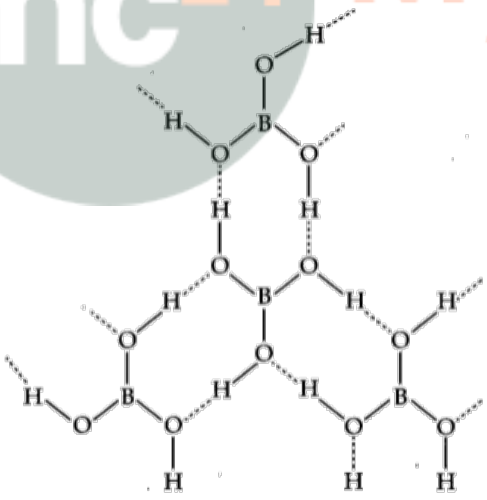
18. Carbon dioxide can ability to trap the heat emitted by the sun radiation. Higher the amount of CO_2, higher the amount of heat trapped. Therefore, this results in an increase in temperature of the atmosphere causing global warming. Hence, excessive content of carbon dioxide is a threat to us.

19. Explain structures of diborane and boric acid.

19. Boric acid contains planar BO_3^{3-} ions which are linked together through hydrogen bonding shown in the figure.



Structure of Diborane (B_2H_6) molecule



Structure of boric acid

20. What happens when

(a) Borax is heated strongly,

(b) Boric acid is added to water,

(c) Aluminium is treated with dilute NaOH,

(d) BF_3 is reacted with ammonia?

20. The molecular formula of borax is $Na_2B_4O_7.10H_2O$. On heating, it loses water molecules and converts into sodium metaborate ($Na_2B_4O_7$) and if we continue the heating process it becomes anhydride, called as boric anhydride.

$Na_2B_4O_7.10H_2O \rightarrow Na_2B_4O_7 \rightarrow 2NaBO_2 + B_2O_3$

(b) When boric acid is added to water it accepts electrons from the water molecule (OH^-) and forms ($[B(OH)_4]^-$)

$B(OH_3) + H_2O \rightarrow [B(OH)_4]^- + H_3O^+$

(c) Aluminium is treated with dilute NaOH hydrogen gas is liberated and form sodium tetrahydroxy aluminate (III).

$2Al + 2NaOH + 6H_2O \rightarrow 2Na^+ [Al(OH)_4]^- + 3H_2$

(d) When BF_3 is reacted with ammonia they form an borane adduct and due to that, the boron atom completes its octet.

$F_3B + :NH_3 \rightarrow F_3B \leftarrow :NH_3$

21. Explain the following reactions

(a) Silicon is heated with methyl chloride at high temperature in the presence of copper;

(b) Silicon dioxide is treated with hydrogen fluoride;

(c) CO is heated with ZnO;

(d) Hydrated alumina is treated with aqueous NaOH solution.

21. (a) A mixture of mono-, di- and trimethyl chlorosilianes along with a small amount of tetramethyl silane is formed.

$$\underset{\text{Methyl chloride}}{CH_3Cl} + Si \xrightarrow[373\,K]{\text{Cu powder}} CH_3SiCl_3 + (CH_3)_2SiCl_2 + (CH_3)_3SiCl + (CH_3)_4Si$$

(b) The initially formed silicon tetrafluoride dissolves in HF to form hydrofluorosilicic acid.

$$SiO_2 + 4HF \longrightarrow SiF_4 + 2H_2O$$

$$SiF_4 + 2HF \longrightarrow H_2SiF_6$$

(c) ZnO is reduced to zinc metal.

$$ZnO + CO \longrightarrow Zn + CO_2$$

(d) Alumina dissolves to form sodium meta-aluminate.

$$\underset{\text{Hydrated alumina or Bauxite}}{Al_2O_3 \cdot 2H_2O(s)} + 2NaOH(aq) \xrightarrow{\text{Heat}} \underset{\text{Sod. meta-aluminate}}{2NaAlO_2} + 3H_2O$$

22. Give reasons:

(i) Conc. HNO_3 can be transported in aluminium container.

(ii) A mixture of dilute NaOH and aluminium pieces is used to open drain.

(iii) Graphite is used as lubricant.

(iv) Diamond is used as an abrasive.

(v) Aluminium alloys are used to make aircraft body.

(vi) Aluminium utensils should not be kept in water overnight.

(vii) Aluminium wire is used to make transmission cables.

22. (i) Concentrated HNO_3 can be stored and transported in aluminium containers as it reacts with aluminium to form a thin protective oxide layer on the aluminium surface. This oxide layer renders aluminium passive.

(ii) Sodium hydroxide and aluminium react to form sodium tetrahydroxoaluminate(III) and hydrogen gas. The pressure of the produced hydrogen gas is used to open blocked drains.

$$2Al + 2NaOH + 6H_2O \longrightarrow 2Na^+\left[Al(OH)_4\right]^- + 3H_2$$

(iii) Graphite has a layered structure and different layers of graphite are bonded to each other by weak van der Waals' forces. These layers can slide over each other. Graphite is soft and slippery. Therefore, graphite can be used as a lubricant.

(iv) In diamond, carbon is sp^3 hybridised. Each carbon atom is bonded to four other carbon atoms with the help of strong covalent bonds. These covalent bonds are present throughout the surface, giving it a very rigid 3-D structure.

It is very difficult to break this extended covalent bonding and for this reason, diamond is the hardest substance known. Thus, it is used as an abrasive and for cutting tools.

(v) Aluminium has a high tensile strength and is very light in weight. It can also be alloyed with various metals such as Cu, Mn, Mg, Si, and Zn. It is very malleable and ductile. Therefore, it is used in making aircraft bodies.

(vi) The oxygen present in water reacts with aluminium to form a thin layer of aluminium oxide. This layer prevents aluminium from further reaction. However, when water is kept in an aluminium vessel for long periods of time, some amount of aluminium oxide may dissolve in water. As aluminium ions are harmful, water should not be stored in aluminium vessels overnight.

(vii) Silver, copper, and aluminium are among the best conductors of electricity. Silver is an expensive metal and silver wires are very expensive. Copper is quite expensive and is also very heavy. Aluminium is a very ductile metal.

Thus, aluminium is used in making wires for electrical conduction.

23. Explain why is there a phenomenal decrease in ionisation enthalpy from carbon to silicon?

23. Ionisation enthalpy of carbon is quite high because it is small in size. However, on going down the group to silicon, there is a sudden decrease in the enthalpy of the silicon. This is due to the large increase in the atomic size of the silicon element.

24. How would you explain the lower atomic radius of Ga as compared to Al?

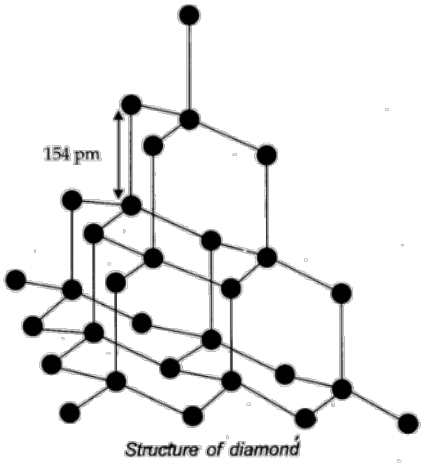
24.

Atomic radius (in pm)	
Aluminium	143
Gallium	135

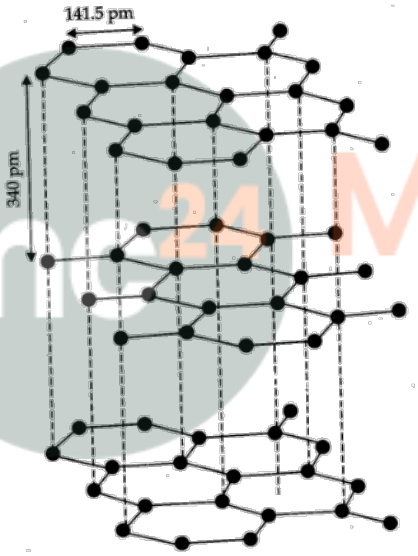
Although Ga has one shell more than Al, its size is lesser than Al. This is because of the poor shielding effect of the 3*d*-electrons. The shielding effect of *d*-electrons is very poor and the effective nuclear charge experienced by the valence electrons in gallium is much more than it is in the case of Al.

25. What are allotropes? Sketch the structure of two allotropes of carbon namely diamond and graphite. What is the impact of structure on physical properties of two allotropes?

25. **Allotropes:** Allotropes are the different forms of an element which are having same chemical properties but different physical properties due to their structures.



Structure of diamond



Structure of Graphite

In diamond, carbon is SP^3 -hybridized. Since, diamond is three dimensional network solid, it is hardest substance with high density whereas graphite has a layered structure. The various layers are formed by van der Waals forces of attraction that's why graphite is soft and slippery.

26. (a) Classify following oxides as neutral, acidic, basic or amphoteric:
CO, B_2O_3, SiO_2, CO_2, Al_2O_3, PbO_2, Tl_2O_3
(b) Write suitable chemical equations to show their nature.

26. CO is a neutral

Acidic oxides-

Being acidic, the oxides react with bases to form a salt. So take base = sodium hydroxide (NaOH)

B_2O_3, SiO_2, CO_2

these compounds react with a base to form salts. ex.- sodium metaborate, sodium silicate and sodium carbonate respectively.

Basic Oxides-

It reacts with an acid to form salts. let acid = hydrochloric acid (HCl). for example thallium chloride.

$Tl_2O_3 + 6HCl \rightarrow 2TlCl_3 + 3H_2O$

Amphoteric Oxides-

These oxides have a tendency to react with acid as well as with the base.

PbO_2, Al_2O_3

The reaction of lead oxide with acid and base-

$PbO_2 + 2NaOH \rightarrow Na_2PbO_3 + H_2O$

$PbO_2 + 2H_2SO_4 \rightarrow 2PbSO_4 + 2H_2O + O_2$

The reaction of aluminium oxide with base and acid-

$Al_2O_3 + 2NaOH \rightarrow NaAlO_2$

$Al_2O_3 + 3H_2SO_4 \rightarrow Al_2(SO_4)_3 + 3H_2O$

27. In some of the reactions thallium resembles aluminium, whereas in others it resembles with group I metals. Support this statement by giving some evidences.

27. Thallium belongs to group 13 of the periodic table. The most common oxidation state for this group is +3. However, heavier members of this group also display the +1 oxidation state. This happens because of the inert pair effect.

Aluminium displays the +3 oxidation state and alkali metals display the +1 oxidation state. Thallium displays both the oxidation states. Therefore, it resembles both aluminium and alkali metals.

Thallium, like aluminium, forms compounds such as $TlCl_3$ and Tl_2O_3. It resembles alkali metals in compounds Tl_2O and TlCl.

28. When metal X is treated with sodium hydroxide, a white precipitate (A) is obtained, which is soluble in

excess of NaOH to give soluble complex (B). Compound (A) is soluble in dilute HCl to form compound (C). The compound (A) when heated strongly gives (D), which is used to extract metal. Identify (X), (A), (B), (C) and (D). Write suitable equations to support their identities.

28.

$$\underset{(X)}{Al} + 3NaOH \longrightarrow \underset{(A)}{Al(OH)_3} \downarrow + 3Na$$

$$\underset{(A)}{Al(OH)_3} + NaOH \longrightarrow \underset{\substack{\text{Soluble}\\ \text{'B'}\\ \text{Sod. tetrahydroxoaluminate}\\ (III)}}{Na^+\left[Al(OH)_4\right]^-}$$

Since A is amphoteric in nature.

$$\underset{(A)}{Al(OH)_3} + \text{dil. } HCl \longrightarrow \underset{(C)}{AlCl_3} + 3H_2O$$

$$2\underset{(A)}{Al(OH)_3} \xrightarrow{\Delta} \underset{(D)}{Al_2O_3} + 3H_2O$$

29. What do you understand by (a) inert pair effect (b) allotropy and(c) catenation?

29. **(a) Inert pair effect-**

On moving down the group in the periodic table, the tendency of s-orbital electron to participate in bonding is decreased. This effect is known as the inert pair effect. For example, in group 13 element (ns^2, np^1) the stability of +1 oxidation is more than the +2 oxidation state due to the poor shielding of the ns^2 electrons by the d and f electron, as a result, ns^2 electrons are strongly held by the nucleus.

(b) Allotropy-

The existence of an element in more than one form. The various forms of the same element are known as allotropes. They have the same chemical properties but different physical properties. For example- Carbon exists in three allotropic forms: diamond, fullerene and the graphite.

(c) Catenation-

The same atoms of element link with another same atom via a strong covalent bond to form long chains or branches. This type of property is known as catenation. Carbon and silicon show this property.

30. A certain salt X, gives the following results.

(i) Its aqueous solution is alkaline to litmus.

(ii) It swells up to a glassy material Yon strong heating.

(iii) When conc. H_2SO_4 is added to a hot solution of X, white crystal of an acid Z separates out.

Write equations for all the above reactions and identify X, Y and Z.

30. (i) $Na_2B_4O_7 + 10H_2O \xrightarrow{\text{water}} 2NaOH + H_2B_4O_7 + 8H_2O$

(ii) $Na_2B_4O_7 \xrightarrow{\text{heat}} 2NaBO_2 + B_2O_3$

(iii) $Na_2B_4O_7 \cdot 10H_2O + H_2SO_4 \longrightarrow 4H_3BO_3 + Na_2SO_4 + 5H_2O$

31. Write balanced equations for:

(i) $BF_3 + LiH \longrightarrow$

(ii) $B_2H_6 + H_2O \longrightarrow$

(iii) $NaH + B_2H_6 \longrightarrow$

(iv) $H_3BO_3 \xrightarrow{\Delta}$

(v) $Al + NaOH \longrightarrow$

(vi) $B_2H_6 + NH_3 \longrightarrow$

31. (i) When boron trifluoride reacts with lithium hydride it gives diborane and lithium fluoride.

$BF_3 + LiH \rightarrow B_2H_6 + 6LiF$

(ii) On treating diborane with water it gives orthoboric as the main product and liberates hydrogen gas.

$B_2H_6 + H_2O \rightarrow 2H_3BO_3 + 6H_2$

(iii) When diborane reacts with the sodium hydride in the presence of ether, it gives sodium borohydride.

$NaH + B_2H_6 \rightarrow 2NaBH_4$

(iv) $\underset{\text{Orthoboric acid}}{H_3BO_3} \xrightarrow{\Delta} \underset{\text{Metaboric acid}}{HBO_2} + H_2O$

$4HBO_2 \xrightarrow[-H_2O]{\Delta} H_2B_4O_7 \longrightarrow 2B_2O_3 + H_2O$

Metaboric acid — Tetraboric acid — Boron trioxide

(v) Aluminium on reacting with a strong alkali like sodium hydroxide with the presence of moisture gives sodium tetrahydroxoaluminate complex and liberates hydrogen gas.

$Al + NaOH + 6H_2O \rightarrow 2Na + [Al(OH)_4]^-(aq) + 3H_2$

(vi) When diborane reacts with the ammonia it forms borazine on strong heating, which is also called inorganic benzene.

$$B_2H_6 + 6NH_3 \rightarrow 3\left[BH_2\left(NH_3\right)_2\right]^+\left[BH_4\right]^- \xrightarrow{\Delta} 2B_3N_3H_6 + 12H_2$$

32. Give one method for industrial preparation and one for laboratory preparation of CO and CO_2 each.

32. **Caron dioxide**

In the laboratory, CO_2 can be prepared by the action of dilute hydrochloric acid on calcium carbonate. The reaction involved is as follows:

$$CaCO_3 + 2HCl_{(aq)} \longrightarrow CaCl_{2(aq)} + CO_{2(g)} + H_2O_{(l)}$$

CO_2 is commercially prepared by heating limestone. The reaction involved is as follows:

$$CaCO_3 \xrightarrow{\Delta} CaO + CO_2 \uparrow$$

Caron monoxide

In the laboratory, CO is prepared by the dehydration of formic acid with conc. H_2SO_4, at 373 K. The reaction involved is as follows:

$$HCOOH \xrightarrow[\text{conc. } H_2SO_4]{373\text{ K}} H_2O + CO \uparrow$$

CO is commercially prepared by passing steam over hot coke. The reaction involved is as follows:

$$C_{(s)} + H_2O_{(g)} \xrightarrow{473-1273\text{ K}} \underbrace{CO_{(g)} + H_{2(g)}}_{\text{water gas}}$$

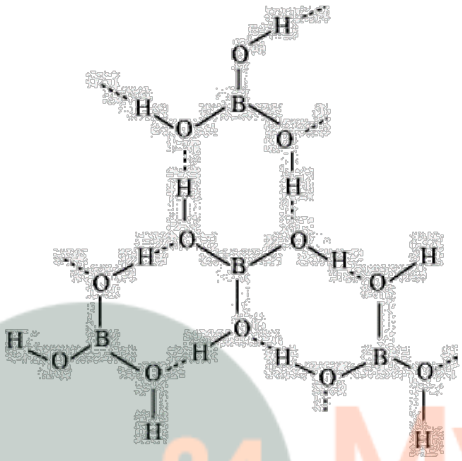
33. An aqueous solution of borax is

(a) neutral (b) amphoteric
(c) basic (d) acidic

33. Borax is a salt of a strong base (NaOH) and a weak acid (H_3BO_3), therefore, it is basic in nature, i.e., option (c) is correct.

34. Boric acid is polymeric due to
(a) its acidic nature (b) the presence of hydrogen bonds
(c) its monobasic nature (d) its geometrya

34. (b) Boric acid is polymeric because of the presence of hydrogen bonds. In the given figure, the dotted lines represent hydrogen bonds.



35. The type of hybridisation of boron in diborane is
(a) sp (b) sp^2
(c) sp^3 (d) dsp^2

35. In B_2H_6, B is sp^3-hybridized. Therefore, option (c) is correct.

36. Thermodynamically the most stable form of carbon is
(a) diamond (b) graphite
(c) fullerenes (d) coal

36. (b) Graphite is thermodynamically the most stable form of carbon.

37. Elements of group 14
(a) exhibit oxidation state of +4 only (b) exhibit oxidation state of +2 and +4
(c) form M^{2-} and M^{4+} ion (d) form M^{2+} and M^{4+} ions

37. Elements of group 14 have 4 valance electrons. so the oxidation state of the group is +4 and +2. Due to the inert pair effect, the stability of +2 is more on moving down the group.
So, the correct option is **B**.

38. If the starting material for the manufacture of silicones is $RSiCl_3$, write the structure of the product formed.

38. Hydrolysis of aikyltrichlorosilanes gives cross-linked silicons.