



KJB SCIENCE SCHOOL

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PRACTICE SHEET:1 [2014-15] CLASS – XII [Chemistry] CHAPTER ->
p- BLOCK ELEMENTS

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Q.1 Why are pentahalides more covalent than trihalides?

Ans:In pentahalides, the oxidation state is +5 and in trihalides, the oxidation state is +3. Since the metal ion with a high charge has more polarizing power, pentahalides are more covalent than trihalides.

Q.2 Why is BiH₃ the strongest reducing agent amongst all the hydrides of Group 15 elements?

Ans:As we move down a group, the atomic size increases and the stability of the hydrides of group 15 elements decreases. Since the stability of hydrides decreases on moving from NH₃ to BiH₃, the reducing character of the hydrides increases on

Q.7 Bond angle in PH₄⁺ is higher than that in PH₃. Why?

Ans:In PH₃, P is sp³ hybridized. Three orbitals are involved in bonding with three hydrogen atoms and the fourth one contains a lone pair. As lone pair-bond pair repulsion is stronger than bond pair-bond pair repulsion, the tetrahedral shape associated with sp³ bonding is changed to pyramidal. PH₃ combines with a proton to form PH₄⁺ in which the lone pair is absent. Due to the absence of lone pair in PH₄⁺, there is no lone pair-bond pair repulsion. Hence, the bond angle in PH₄⁺ is higher

moving from NH_3 to BiH_3 .

Q.3 Why is N_2 less reactive at room temperature?

Ans: The two N atoms in N_2 are bonded to each other by very strong triple covalent bonds. The bond dissociation energy of this bond is very high. As a result, N_2 is less reactive at room temperature.

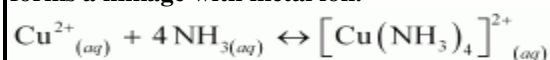
Q.4 Mention the conditions required to maximise the yield of ammonia.

Ans: Ammonia is prepared using the Haber's process. The yield of ammonia can be maximized under the following conditions:

- (i) High pressure (~ 200 atm)
- (ii) A temperature of ~700 K
- (iii) Use of a catalyst such as iron mixed with small amounts of K_2O and Al_2O_3 .

Q.5 How does ammonia react with a solution of Cu^{2+} ?

Ans: NH_3 acts as a Lewis base. It donates its electron pair and forms a linkage with metal ion.

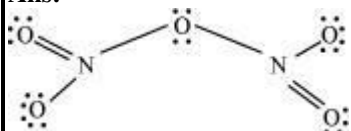


Blue

Deep blue

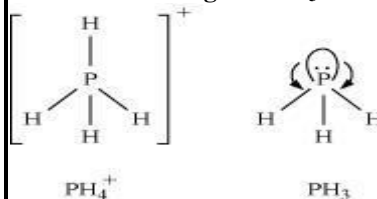
Q.6 What is the covalence of nitrogen in N_2O_5 ?

Ans:



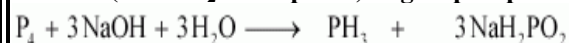
From the structure of N_2O_5 , it is evident that the covalence of nitrogen is 4.

than the bond angle in PH_3 .



Q.8 What happens when white phosphorus is heated with concentrated NaOH solution in an inert atmosphere of CO_2 ?

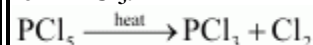
Ans: White phosphorus dissolves in boiling NaOH solution (in a CO_2 atmosphere) to give phosphine, PH_3 .



Phosphine Sodium hypophosphite

Q.9 What happens when PCl_5 is heated?

Ans: All the bonds that are present in PCl_5 are not similar. It has three equatorial and two axial bonds. The equatorial bonds are stronger than the axial ones. Therefore, when PCl_5 is heated strongly, it decomposes to form PCl_3 .



Q.10 Write a balanced equation for the hydrolytic reaction of PCl_5 in heavy water.

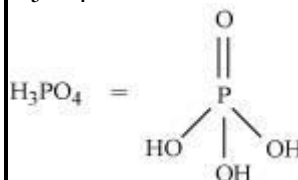


Ans:

Q.11 What is the basicity of H_3PO_4 ?

Answer :

H_3PO_4



Since there are three OH groups present in H_3PO_4 , its basicity is three i.e., it is a tribasic acid.



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