



## MORE QUESTIONS SOLVED

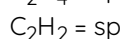
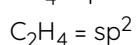
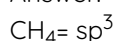
### I. Very Short Answer Type Questions

Question 1. How is bond order related to the stability of a molecule?

Answer: Higher the bond order, greater is the stability.

Question 2. Write the type of hybridisation involved in  $\text{CH}_4$ ,  $\text{C}_2\text{H}_4$  and  $\text{C}_2\text{H}_2$ .

Answer:

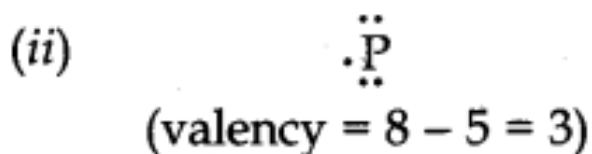
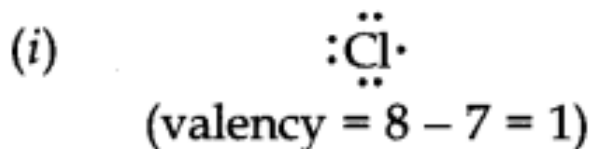


Question 3. Out of sigma and  $\pi$  bonds, which one is stronger and why?

Answer: sigma-bond is stronger. This is because sigma-bond is formed by head-on overlapping of atomic orbitals and  $\pi$  bond is formed by side wise overlapping.

Question 4. Write the Lewis dot symbols of the following elements and predict their valencies. (i) Cl (ii) P

Answer:



Question 5. Predict the shapes of the following molecules using VSEPR theory?

(i)  $\text{BeCl}_2$  (ii)  $\text{SiCl}_4$

Answer:

(i) Linear

(ii) Tetrahedral

Question 6. Write the state of hybridisation of boron in  $\text{BF}_3$ .

Answer:  $\text{sp}^2$

Question 7. Arrange  $\text{O}_2$ ,  $\text{O}_2^-$ ,  $\text{O}_2^{2-}$ ,  $\text{O}_2^+$  in increasing order of bond energy.

Answer:  $\text{O}_2^{2-} < \text{O}_2^- < \text{O}_2 < \text{O}_2^+$

Question 8. What is meant by bond pairs of electrons?

Answer: The electron pairs involved in the bond formation are known as bond pairs or shared pairs.

Question 9. Which of the following has larger bond angle in each

pair?

(i)  $\text{CO}_2$ ,  $\text{BF}_3$  (ii)  $\text{NH}_3$ ,  $\text{CH}_4$

Answer: (i)  $\text{CO}_2$  (ii)  $\text{CH}_4$

Question 10. Arrange the following, according to increasing covalent nature.

$\text{NaCl}$ ,  $\text{MgCl}_2$ ,  $\text{AlCl}_3$

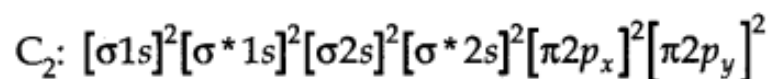
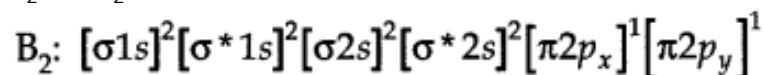
Answer:  $\text{NaCl} < \text{MgCl}_2 < \text{AlCl}_3$

Question 11. Define covalent bond according to orbital concept?

Answer: Covalent bond can be formed by the overlap of the orbitals belonging to the two atoms having opposite spins of electrons.

Question 12. Why  $\text{B}_2$  is paramagnetic in nature while  $\text{C}_2$  is not?

Answer: The molecular orbital electronic configuration of both  $\text{B}_2$  and  $\text{C}_2$  are.



Since,  $\text{B}_2$  has two unpaired electrons,  $\text{B}_2$  is paramagnetic.

$\text{C}_2$  has no unpaired electron. Thus,  $\text{C}_2$  is diamagnetic.

Question 13. Why ethyl alcohol is completely miscible with water?

Answer: This is because ethyl alcohol forms H-bonds with water.

Question 14. Which is more polar  $\text{CO}_2$  or  $\text{N}_2\text{O}$ ? Give reason.

Answer:

$\text{N}_2\text{O}$  is more polar than  $\text{CO}_2$ .

This is "because  $\text{CO}_2$  is linear and symmetrical. Its net dipole moment is zero.

$\text{N}_2\text{O}$  is linear but not symmetrical. It has a net dipole moment of sigma II6D.

Question 15. State the types of hybrid orbitals associated with (i) P in  $\text{PCl}_5$  and (ii) S in  $\text{SF}_6$

Answer:

(i)  $\text{sp}^3\text{d}$  of P in  $\text{PCl}_5$

(ii)  $\text{sp}^3\text{d}^2$  of S in  $\text{SF}_6$

Question 16. Why  $\text{N}_2$  is more stable than  $\text{O}_2$ ? Explain on the basis of molecular orbital theory.

Answer: Bond order of  $\text{N}_2$  (= 3) is greater than that of  $\text{O}_2$  (= 2).

Question 17. How is bond order related to bond length of a molecule?

Answer: Bond length is inversely proportional to bond order.

Question 18. Out of bonding and antibonding molecular orbitals, which one has lower energy and which one has higher stability?

Answer: Bonding molecular orbital has lower energy and higher stability.

Question 19. Define antibonding molecular orbital.

Answer: The molecular orbital formed by the subtractive effect of the electron waves of the combining atomic orbitals, is called antibonding molecular orbital.

Question 20. Name the two conditions which must be satisfied for hydrogen bonding to take place in a molecule.

Answer:

(i) The molecule should contain highly electronegative atom like

hydrogen atom.

(ii) The size of electronegative atom should be small.

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