Daily Tutorial Sheet-1	JEE Advanced (Archive)

1. Melting point, Boiling point, Solubility, conductivity in aq. solution

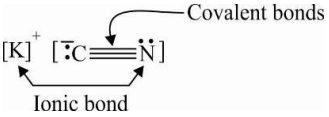
(i) **Melting points** Ionic compounds have higher melting points than covalent compounds.

(ii) **Boiling points** Ionic compounds have higher boiling points than covalent compounds.

(iii) **Solubility** Ionic compounds have greater solubility in water than a covalent compound.

(iv) **Conductivity in aqueous solution** Ionic compounds have greater electrical conductivity in aqueous solution while covalent compounds are usually non-conducting.

2.(ABC) The bonding between cation and anion is ionic while carbon and nitrogen are covalently bonded in cyanide ion as :



3.(A) Strongly electropositive, univalent X will form an 1 : 1 ionic compound with strongly electronegative, univalent Y. $X + Y \longrightarrow X^+Y^-$

4.(AB) SiO_2 and S_8 are covalent molecules with a sigma covalent bond between Si and O and S and S atoms.

5.(C) For non-polar MX_3, it must have triangular planar arrangement, i.e. there should be sp^2 – hybridisation around M.

6.(HCOOH and CH_3COOH)

$H-\overset{\overset{O}{\|}}{C}-OH$ and $CH_3-\overset{\overset{O}{\|}}{C}-OH$. Both are capable of forming H-bonds.

7. CO_2, it is 180^o.

8.(sp^3) sp^3-hybrid orbital holding the lone pair is involved in formation of ammonium ion.

9.(A) CO has a total of 14 electrons and CN^- also has 14 electrons.

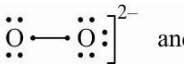
$$C(6e^-) + N(7e^-) + e^- \longrightarrow CN^-(14e^-)$$

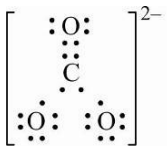
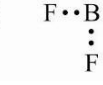
10.(A) CO_2 is a linear molecule because of sp-hybridisation around carbon atom.

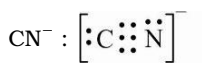
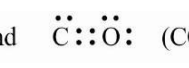
11.(2) These are $2\pi-$ bonds in a nitrogen molecule

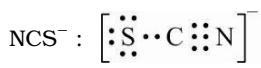
12.(D) HCl does not form hydrogen bond. For formation of hydrogen bond, atleast one hydrogen atom must be bonded to one of the three most electronegative atom O, N and F.

13. (Based on octet completion)

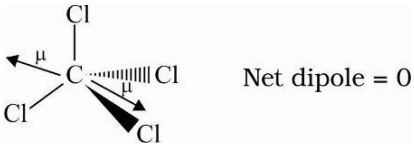
(i) O_2^{2-} :  and  (Cl_2)

(ii) CO_3^{2-} :  and  (BF_3)

(iii) CN^- :  and  (CO)

(iv) NCS^- :  and  (ClCN)

14.(B) CCl_4 has a regular tetrahedral shape.



Net dipole = 0

15.(T) Linear overlapping of p-orbitals form sigma bond while sidewise overlapping of two p-orbitals forms a pi bond.