**ALVA’S P.U COLLEGE, MOODBIDRI**

**DEPARTMENT OF CHEMISTRY**

**NEET / CET / JEE CRASH COURSE – 2020**

**SUBJECT - CHEMISTRY**

**TOPIC - CHEMICAL BONDING AND MOLECULAR STRUCTURES**

1. The compound which contains ionic as well as covalent bond is

a) C2H4Cl2 b) CH3I c) KCN d) H2O2

Ans : c

contains both ionic and covalent bonds.

1. Which one of the following is a hypervalent compound?

a) SiO2 b) PBr3 c) PCl5 d) SO2

Ans : c

In PCl5 there are 10 electrons around P.

1. Dipole moment is shown by

a) 1, 4-dichlobenzene b) cis – 1, 2-dichlorobenzene

c) trans – 1, 2 – dichloroethene d) trans – 2, 3 – dichloro – 2 – butene

Ans : b



Cis – 1, 2 – dichloroethene will have some net dipole moment.

1. Pairs of molecules having identical geometry is

a) BF3, NH3 b) BF3, AlF3 c) BeF2, H2O d) BCl3, PCl3

Ans : b

BF3 and AlF3 both are planar triangular.

1. The structure of IF5 can be best described as



Ans : c

For IF5, , hybridization = sp3d2

1. Among LiCl, RbCl, BeCl2 and MgCl2 the compounds with the greatest and least ionic character respectively are

a) LiCl and RbCl b) RbCl and BeCl2 c) RbCl and MgCl2 d) MgCl2 and BeCl2

Ans : b

According to Fajan’s rule larger cation and smaller anion will form ionic bond.

1. Which of the following has the highest melting point?

a) BeCl2 b) MgCl2 c) CaCl2 d) BaCl2

Ans : d

BaCl2 has highest ionic character.

1. Total number of lone pairs of electrons on Xe in XeOF4 is

a) 0 b) 1 c) 3 d) 3

Ans : b



1. If Z axis is the molecular axis, then antibonding molecular orbitals are formed by overlap of

a) s-pz b) px - py c) pz – pz d) px - px

Ans : d

px - px orbital overlap forms antibonding molecular orbitals.

1. Which of the following pairs of compound is isoelectronic and isostructural?

a) BeCl2, XeF2 b) TeI2, XeF2 c)  d) IF3, XeF2

Ans : c

total number of valence electrons are equal in both the species and both the species are linear also.

1. The variation of the boiling points of hydrogen halide is in order of HF > HI > HBr > HCl. What explains the higher boiling point of hydrogen fluoride?

a) the bond energy of HF molecules is greater than in other hydrogen halides

b) the effect of nuclear shielding is much reduced in fluorine which polarize the HF molecule

c) the electronegativity of fluorine is much higher than for other elements in the group

d) there is strong hydrogen bonding between HF molecules

Ans : d

1. According to MOT, which of the following is true with respect to and ?

a) both are unstable b) both are stable

c) is stable and is unstable d) is unstable and is stable

Ans : b



Both order of 

Both order of 

Both and has non zero bond order and hence both are stable.

1. Among the four aromatic compounds which one will have the lowest melting point?



Ans : b

Non polar compounds have weak Van der Waals attraction force, so their melting point is lowest.

1. Among the following molecules / ions . Which one is diamagnetic and has the shortest bond length?

a)  b) O2 c)  d) 

Ans : c

= Paramagnetic

and = Diamagnetic

has B.O = 1, has B.O = 3

Therefore is diamagnetic and has shortest bond length.

1. In which of the following molecules / ions and H2O, the central atom is sp2 hybridized?

a) and  b)  and  c) BF3 and  d) and 

Ans : c

In BF3 and the central atoms are sp2 hybridized.

1. Which one of the following pairs is structural

a) BCl3 and BrCl3 b) NH3 and  c) NF3 and BF3 d) and 

Ans : d

and both have sp3 – hybridization and tetrahedral structure.

1. Ortho nitrophenol is less soluble in water than p – and m-nitrophenols because

a) melting point of O-Nitrophenol is lower than those of m - and p - isomers

b) O-Nitrophenol is more volatile in steam than those of m – and p – isomers

c) O- Nitrophenol shows intramolecular H-bonding

d) O-Nitrophenol shows intermolecular H- bonding

Ans : c

1. Which of the following contains maximum number of electrons in the antibonding molecular orbitals?

a) O2 b)  c)  d) 

Ans : b



No. of e- in the antibonding M.O. = 4. We will have in in and 

1. The magnetic moment of KO2 at room temperature is \_\_\_\_\_\_\_\_\_BM

a) 1.41 b) 1.73 c) 2.23 d) 2.64

Ans : b

KO2 contains ion which has one unpaired electron. Hence BM.

1. The correct order of bond angles (smallest first) in H2S, NH3, BF3 and SiH4 is

a)  b) 

c)  d) 

Ans : c

H2S < NH3 < SiH4 < BF3

92.6° 107° 109° 120°

1. The dipole moment of o,p, and m- dichlorobenzene will be in the order

a) o > p > m b) p > o > m c) m > o > p d) o > m > p

Ans : d



1. If molecule MX3 has zero dipole moment, the sigma bonding orbitals used by M [atomic number < 21] are

a) BF3 b) SF4 c) SiF4 d) XeF4

Ans : c

It must have triangular planar geometry and sp2 – hybridization.

1. If the central atoms in a certain molecule has two lone pairs and three bond pairs, the shape of the molecule could be

a) T – shaped b) trigonal planar c) trigonal bipyramidal d) distorted tetrahedral

Ans : a

1. Match the entries of column I with appropriate entries of column II and choose the correct option

|  |  |
| --- | --- |
| **Column – I (Molecule)** | **Column – II (Shape)** |
| 1. PCl3 2. AlCl3 3. ClF3 4. SO3 | p) Trigonal pyramidal  q) Planar triangular  r) T – Shaped  s) Ionic / No definite shape |

a) A – q, B – p, C – p, D – r b) A – p, B – s, C – r, D – q

c) A- p, B – q, C – r, D – q d) A – r , B – s, C –p, D – q

Ans : c

1. Assertion : Na2SO4 is soluble in water while BaSO4 is insoluble

Reason : Lattice energy of BaSO4 exceeds its hydration energy

a) both assertion and reason are true and reason is the correct explanation of assertion

b) both assertion and reason are true but reason is not the correct explanation of assertion

c) assertion is true but reason is false

d) both assertion and reason are false

Ans : a

1. The geometrical arrangements of electron pairs and shape of are respectively

a) trigenal bipyramidal geometry, linear shape

b) hexagonal geometry, T – Shape

c) triangular planar geometry, triangular shape

d) tetrahedral geometry, pyramidal shape

Ans : a

X for 

Hence hybridization of I in is sp3d

Thus has trigonal bipyramidal geometry with linear shape.

1. Which of the following species has a linear shape?

a)  b) O3 c)  d) SO2

Ans : a

is linear. All others are bent molecules.

1. Which of the following conversions involves change in both hybridization and shape?

a)  b)  c)  d) 

Ans : c

Triangular planar

Tetrahedral

1. Which of the following resonating structures is not correct for CO2 ?



Ans : c

1. The correct statement about ICl5 and 

a) both are isostructural

b) ICl5 is square pyramidal and square planar

c) ICl5 is trigonal pyramidal and  is tetrahedral

d) ICl5 is square pyramidal and tetrahedral

Ans : b

ICl5 is sp3d2 square pyramidal



square planar sp3d2 hybridisation.

1. According molecular orbital theory the following will not be the viable molecule?

a) H2 b)  c)  d) 

Ans : d



1. In allene (C3H4), the type (s) of hybridization of the carbon atoms is (are)

a) only sp2 b) sp2 and sp c) sp and sp3 d) sp2 and sp3

Ans : b



1. The energy of is greater than orbital because

a) orbital is bigger than orbital

b) is a bonding orbital whereas is an antibonding orbital

c) orbital has a greater value of “n” than orbital

d) orbital is formed only after 

Ans : c

The energy of MO increases as the value of the principal quantum number (n) increases.

1. The statement true for is

a) it has a non linear structure

b) it is called psedohalogen

c) the formal oxidation state of nitrogen in this anion is – 1

d) it is isoelectronic with NO2

Ans : c

Azide ion is a linear, it is a pseudohalide ion. The formal oxidation state of N in ion is – 1 .

1. The octet rule is not followed in

a) F2 b) NaF c) CaF2 d) BF3

Ans : d

BF3 does not have octet, it has only six electrons.

1. The major binding force of diamond silicon and quartz is

a) electrostatic force b) electrical attraction

c) covalent bond force d) non covalent bond for force

Ans : c

Diamond, silicon and quartz molecule bounded by covalent bond.

1. The polarizing power of the following anions and follow the order

a)  b)  c)  d) 

Ans : d

Greater is the negative charge and size of anion, higher its polarizing power.

1. In N2 molecule, the atoms are bonded by

a) one , two  b) one , one  c) two , one  d) three bonds

Ans : a

1. Geometry of ammonia molecule and the hybridization of nitrogen involved in it are
2. sp3 – hybridization and tetrahedral geometry
3. sp3 – hybridization and distorted tetrahedral geometry
4. sp2 – hybridization and triangular geometry
5. none of these

Ans : b

Sp3 – hybridization and distorted tetrahedral (pyramidal)

1. The bond angle between H – O – H in ice is closest to

a)  b)  c) 90° d) 105°

Ans : d

1. Arrange the following in the increasing order their bond order and 

a)  b)  c)  d) 

Ans : d

B.O of  B.O of 

B.O of , B.O of 

1. Acetic acid exists as dimer in benzene due to

a) condensation reaction b) hydrogen bonding

c) presence of carboxyl group d) presence of hydrogen atom act - carbon

Ans : b

1. The d-orbital involved in sp3d hybridization is

a)  b) dxy c)  d) dzx

Ans : c

1. Maximum covalent character is associated with the compound

a) NaI b) MgI2 c) AlCl3 d) AlI3

Ans : d

AlI3 shows covalent character, according to Fajan’s rule.

1. Assertion : Order of lattice energy for same halides as LiX > NaX > KX

Reason : Size of alkaline earth metal increases from Li to K

a) if both assertion and reason are true and reason is the correct explanation of assertion

b) if both assertion and reason are true but reason is not the correct explanation of assertion

c) if assertion is true but reason is false

d) if assertion is false but reason is true.

Ans : c

Li, Na and K are alkali metals and not alkaline earth metals. So, size of alkali metal increases so assertion is true and reason are false.