H.W Bonds and forms of molecules (2)

Write scientific term:

1- The bond resulted from overlapping two atomic orbitals head to head.

2- The bond resulted from overlapping two atomic orbitals side by side.

3- The atoms of elements tend to reach octet structure of the nearest noble gas with exception of hydrogen, lithium and beryllium.

4- Overlapping between orbitals of the same atom to produce orbitals having the same shape and energy.

5- Hybridization type produced by overlapping of s orbital with one p orbital.

6- A carbon atom contains four single electrons.

Complete:

1- The hybrid orbital sp^3 is produced from overlapping …….. with …….

2- The type of hybridization of carbon atom in methane molecule is …….

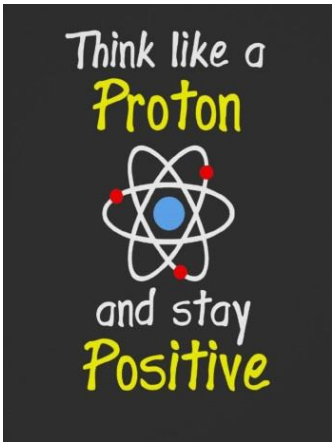
3- The theory that proposed that the formation of the covalent bond is a result of overlapping orbital contain single electron form one atom with a similar orbital of another atom is called …….

4- The angle between the hybridized orbitals SP^2 is ……..

5- The pi bond between the two carbon atoms in ethylene molecule is formed form overlapping …… with …… orbitals.

6- The number of orbitals produced form the hybridization sp is …….

7- The angle between the hybridized orbitals sp is …….



What's meant by:

1- Hybridization:

2- Elecronic theory of valency:

3- The valence bond theory:

4- SP^2 hybridization:

5- Sigma bond:

6- Pi bond:

Give reason for:

1- The octet rule can't be applied of boron trifluoride?

……

2- The hybrid orbital is more active than the pure one?

……

3- The sigma bond is stronger than pi bond?

……

4- The hybrid orbitals in methane molecule takes tetrahedron shape while in ethylene take planner triangle?

……

……

Mention the inadequacies of octet rule?

……

……

……

Compare between BF_3 and CH_4 according to stereostructure no. of bond pairs and no. of lone pairs.

Choose the correct answer:

1- According to the valence bond theory, which of the following orbitals undergo overlapping to form Cl_2 molecules? (Cl=17)

(3s – 3p – 4s – 4p)

2- The stereo structure of the molecule can't be linear if the hybridization in the central atom is ……..

(sp only – sp^2 only – sp^3 only – sp^2 or sp^3)

3- What is the number of sigma bonds in the opposite compound?

$CH_2=CH-CH_2-CO-O-CH_2-CH=CH_2$

(15 – 17 – 18 – 21)

4- In sp^2 hybridization, the arrangement of electron pairs in space is ……

(linear – planar triangular – tetrahedral – angular)

5- The value of the angle between the bonds in BCl_3 molecule is ……..

(90^o – 109.5^o – 120^o – 180^o)

6- What is the change in the value of the angle between hybridized orbital when the hybridization changes from sp then to sp^3?

(decreases – doesn't change – increases – decreases then increases)

7- Hybridization process takes place between orbitals of ……. sublevels.

(1s&1p – 2s&2p – 5s&3d – 4d&3p)

8- PCl_5 doesn't obey to the octet rule because:

a- Chlorine atoms don't get to the octet structure

b- It is unstable compound

c- Phosphorus atom doesn't get the octet structure

d- Both a and c are correct

9- The bond (C-H) in methane molecule is originated from the hybridization of ……

(s with sp – s with sp^2 – s with sp^3 – sp with sp)

10- The carbon atom in its ground state contains ……. single electrons.

(1 – 2 – 3 – 4)

11- From the properties of the hybrid sp orbitals that they are …….

(three orbitals only – two orbitals only – linear orbitals only – two linear orbitals)

12- The sigma bond between carbon atoms in C_2H_2 is formed from overlapping of …….. orbitals head to head.

(s with sp^2 – sp with sp – sp^2 with sp^2 – sp^2 with sp)

13- Which of following theory couldn't explain why the shape of carbon dioxide is linear?

(octet rule – valence bond theory – Lewis dot symbols)

14- The symmetry of the four bonds in the methane molecules was explained through the concept of ……

(overlapping orbitals of different atoms – excitation – hybridization – no correct answer)

15- The sigma bond in acetylene molecule between (C-H) is formed by overlapping …….

(sp-sp / sp^2-sp^2 / sp^3-sp^3 / sp-s)

16- The ability of the carbon atom to form four bonds in methane molecule was explained by …….

(overlapping orbitals of different atoms – excitation – hybridization – no correct answer)

17- Overlapping between orbitals of the same atom forms ……..

(molecular orbitals – hybridized orbitals – pure orbitals – no correct answer)

18- The hybridization of the carbon atoms in propylene molecule is sp2, which means that the two carbon atoms will bind with ……

a- one sigma and one pi bond
b- one sigma and two pi bonds
c- two sigma bonds
d- two pi bonds

19- The type of the hybridization that the carbon atom undergo during its bonds formation determines ……

a- The shape of the molecule
b- the angle between the formed bonds
c- the number of the formed sigma bonds
d- all the previous

20- The electronic theory of valency explained the stability of the atom by ……

a- overlapping all orbitals that contains single electron
b- reaching octet structure of the nearest noble gas
c- undergoing hybridization
d- forming sigma bonds