DPP
DAILY PRACTICE PROBLEMS

Class : XIth
Date :

Solutions

Subject : CHEMISTRY
DPP No. : 7

Topic :- Chemical Bonding and Molecular Structure

1 **(a)**
6, 6

2 **(a)**
More is the dipole moment more is ionic nature. $\mu = \delta \times d$; higher is μ, more will be δ on the atom.

3 **(c)**
Due to sp^3-hybridization.

5 **(a)**
Each species has 14 electrons and bond order for each is three.

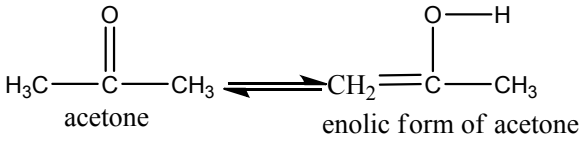
6 **(a)**
Among the given choices of compound having oxygen attached to hydrogen will have maximum hydrogen bonding.
$\because$ Among CH_3OCH_3, $(CH_3)_2C=O$, CH_3CHO and C_2H_5OH only C_2H_5OH has oxygen attached to hydrogen atom.
$\therefore$ C_2H_5OH shows maximum hydrogen bonding.

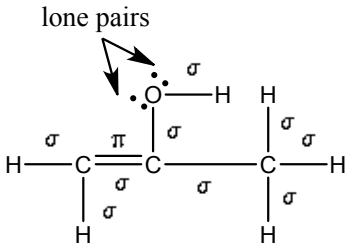
7 **(c)**
It is experimental value.

8 **(c)**
O_2^{2+} has 14 electrons. Its electronic configuration is as
$O_2^{+} : \sigma 1s^2\, {}^{*}\sigma 1s^2\, \sigma 2s^2\, {}^{*}\sigma 2s^2, \pi 2p_y^2\, \pi 2p_z^2 \sigma 2p_x^2$
Bond order $= \frac{N_{b-}N_a}{2} = \frac{10-4}{2} = 3$

9 **(c)**
In diamagnetic molecule, all the electrons are paired

10 **(a)**





Hence, enolic form of acetone contains 9 sigma bonds, 1 pi bond and two lone pairs.

11 **(a)**

In NO_3^- ion, total number of electrons = 7+24+1=32 and in it central atom is sp^2 hybrid.

No. of hybrid orbitals $= \frac{V-8B}{2} + B = \frac{24-8\times3}{2} + 3$

($V \rightarrow$ total number of electrons in valence shell

$B \rightarrow$ probability of formation of bond)

In CO_3^{2-} ion, total number of electrons = 6+24+2=32 and in it central atom is sp^2 hybrid.

No. of hybrid orbital$= \frac{24-8\times3}{2} + 3 = 3$

Hence, NO_3^- and CO_3^{2-} ions are isoelectronic and isostructural.

12 **(b)**

$H_2^+ = \sigma 1s^2$ (According to molecular orbital theory)

$$\text{Bond order} = \frac{\text{bonding electrons} - \text{antibonding electrons}}{2}$$

$$= \frac{1}{2} = 0.5$$

H_2^+ is paramagnetic due to the presence of one unpaired electron.

13 **(b)**

H-bonding in molecules gives rise to increase in b.p.

14 **(a)**

Bond distance is in the order :

$C - C > C = C > C \equiv C$

$sp^3 > sp^2 > sp$

15 **(a)**

% ionic character $= 16(x_A - x_B) + 3.5(x_A - x_B)^2$

$= 16 \times 2 + 3.5 \times (2^2)$

$= 46$

$\therefore$ The % covalent character $= 100 - 46 = 54$

16 **(d)**

ICl_2^- has sp^3d-hybridized state (*i.e.*, trigonal bipyramidal shape but distorted due to the presence of lone pair of electron on I atom.)

17 **(a)**

Like gets dissolved in like.

18 **(c)**

N_2O is isoelectronic with CO_2 and N_3^-.

Hence, its structure is linear.

$$N - N - O$$

19 **(d)**

H atom attached on N, O, F develops hydrogen bonding molecule.

20 **(d)**

In CCl_4 all bonds of carbon being identical, the molecule is a regular tetrahedron

ANSWER-KEY										
Q.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A.	**A**	**A**	**C**	**C**	**A**	**A**	**C**	**C**	**C**	**A**
Q.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A.	**A**	**B**	**B**	**A**	**A**	**D**	**A**	**C**	**D**	**D**