16.(B) Hybridisation of one 's' and one 'p' orbitals gives two sp hybrid orbitals oriented linearly at 180^{o}.

$s + p \longrightarrow 2sp$ hybrid orbitals

17.(T) Sn in $SnCl_2$ has sp^2 – hybridisation.

18.(C) In SO_2, the Lewis-dot structure is $O{=}\ddot{S}{=}O$

Electron pairs at S = 2 (σ – bonds) + 1 (lone-pair) = 3 sp^2 hybridised.

NOTE

π-bonded electrons are not present in hybrid orbitals, therefore not counted in electron pairs. Rather π bonds are formed by lateral overlapping of pure *p*-orbitals.

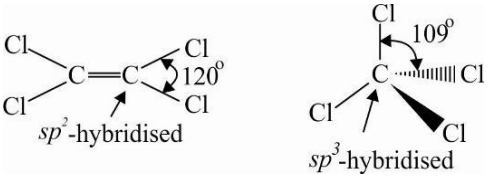
19.(AB) $CO_2, HgCl_2, C_2H_2$ are all linear.

20.(D) Bonds between identical non-metal is purely covalent due to same electronegativities of the bonded atoms. Hence, the bonded atoms have equal hold on the shared pair of electrons.

21.(F) In sp^3 – hybrid orbital, there is 25% s-character and 75% p-character.

22.(F) Carbon in benzene is sp^2 – hybridized, i.e. uses only two of its p-orbitals in hybridization.

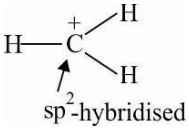
23.(A)



24.(A) CO_2 is linear because carbon is sp-hybridised.

25.(C) In CH_3^+, there are only three electron pairs around carbon atom

giving sp^2 – hybridization state.

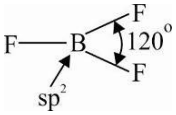


26.(A) PCl_3 has sp^3-hybridised phosphorus, with one lone pair. Therefore, molecule has pyramidal shape like ammonia.

27.(A) O_2^- has odd number of electrons, hence it is paramagnetic.

28.(B) BF_3 has triangular planar arrangement.

Three identical vectors acting in outward direction at equal angles in a plane cancel each other giving zero resultant, hence non-polar.



29.(sp) sp-hybridised.

30. Ag^+

Ag^+ is stronger Lewis acid because it can easily accommodate lone pair of electrons from Lewis base. On the other hand, Na^+ has noble gas configuration, cannot accept lone pair of electron, not at all a Lewis acid.