DPP-04

SOLUTIONS

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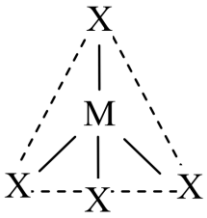
1.



Tetrahedral shape

Number of $\angle XMX$ angle in the compound $MX_4 = 6$

2. $PBr_{5(s)} \rightarrow PBr_4^+ + Br^{\Theta}$

(Cationic part) (anionic part)

So hybridization of anionic part cannot be defined.

3. $2PCl_{5(s)} \rightarrow PCl_4^+ + PCl_6^{\Theta}$

(Cationic part) (anionic part)

PCl_4^+: geometry : Tetrahedral

Bond angle : 109.28°

PBr_4^+: geometry : Tetrahedral

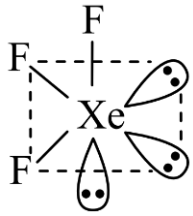
Bond angle : 109.28°

4. The anionic part of $PCl_{5(s)}$ is PCl_6^{Θ}

PCl_6^{Θ}: – geometry : Octahedral

Bond angle : 90°, 180°

5. XeF_3^{Θ} will not be possible, because it contain 3 lone pair - lone pair repulsion at 90°



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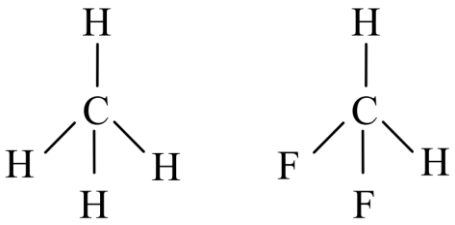
6.



⇒ Both molecules are Tetrahedral in shape and have sp^3 – hybridization
⇒ For regular Tetrahedral geometry. The terminal atom need to be same.

7. (a) $BeCl_2 \longrightarrow$ Linear, sp

$CO_2 \longrightarrow$ Linear, sp

(b) $CO_2 \longrightarrow$ Linear, sp

$SO_2 \longrightarrow$ Bent shape, sp^2

(c) $SO_2 \longrightarrow$ Bent shape, sp^2

$I_3^+ \longrightarrow$ Bent shape, sp^3

(d) $ICl_2^{\ominus} \longrightarrow$ Linear, sp^3 d.

$BeH_2 \longrightarrow$ Linear, sp

8. "Except Tetrahedral all the other geometry can be formed in sp^3 d hybridization"
(A) Linear :- (2-B.P + 3-L.P)

(C) T-shaped :- (2-L.P + 3-B.P)

(D) See-Saw (4-B.P + 1-L.P)

9. In case of sp^3 d^2 hybridization, more than one type of angles are possible in octahedral geometry.
eg :- 180° and 90°

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10. (P) sp^3 (Tetrahedral) : – s - orbital

p_y – orbital

(Q) $sp^3 d^2$ (Octahedral) : – s - orbital

p_y – orbital

d_{z^2} - orbital

$d_{x^2-y^2}$ orbital

(R) sp^3 d(TBP) : – s - orbital

p_y - orbital

d_{z^2} - orbital

(S) dsp^2 (Square planar) : – s - orbital

p_y - orbital

$d_{x^2-y^2}$ - orbital