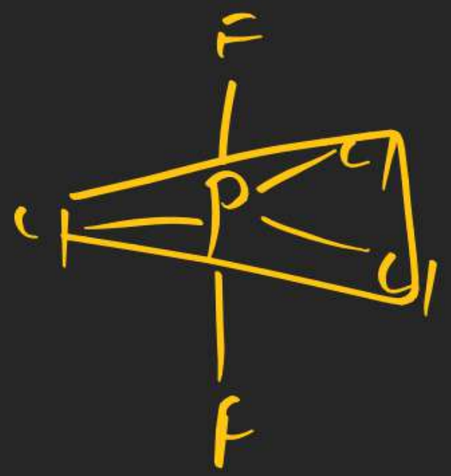
Chemical bonding

EXERCISE # 3

16. How many planes are present in PCl_3F_2 molecule which contains maximum number of atoms?

(4)



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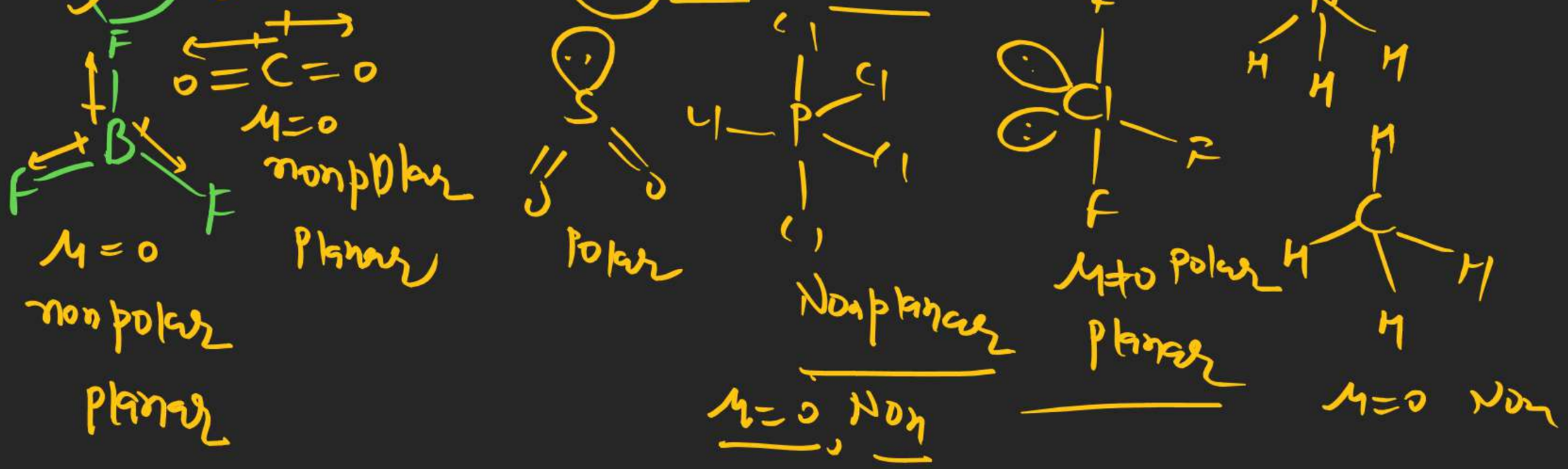
Chemical bonding

EXERCISE # 3

4 + 4 = 8

17. Number of non-polar molecule among the following is x and number of planar molecule is y. calculate the value of x + y.

BF_3, CO_2, SO_2, PCl_5, ClF_3, NH_3, CH_4



Chemical bonding

EXERCISE # 3

18. Number of atomic orbitals involve in hybridisation of anion part of $Cl_2O_6(s)$ is –

(4)

$Cl_2O_6 \longrightarrow ClO_2^+ + ClO_4^-$

$ClO_4^- \Rightarrow sp^3$

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Chemical bonding

EXERCISE # 3

19. In tetrathionic acid number of $p_\pi - p_\pi$ bonds is :

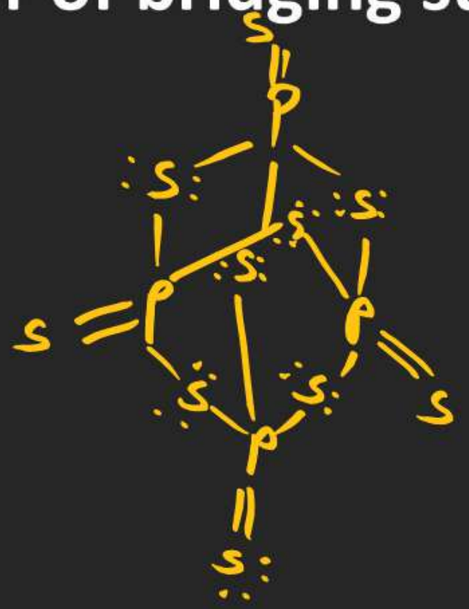
(0)

$H_2S_4O_6$

Chemical bonding

EXERCISE # 3

20. In the structure of $P_4 S_{10}$ molecule, total number of sp^3 Hybridised atoms $= x$, total number of $p_\pi - d_\pi$ bonds $= y$, total number of bridging sulphar $= z$, calculate the value of $x + y + z$.



$= 10 + 4 + 6$

$= 20$

Chemical bonding

EXERCISE # 3

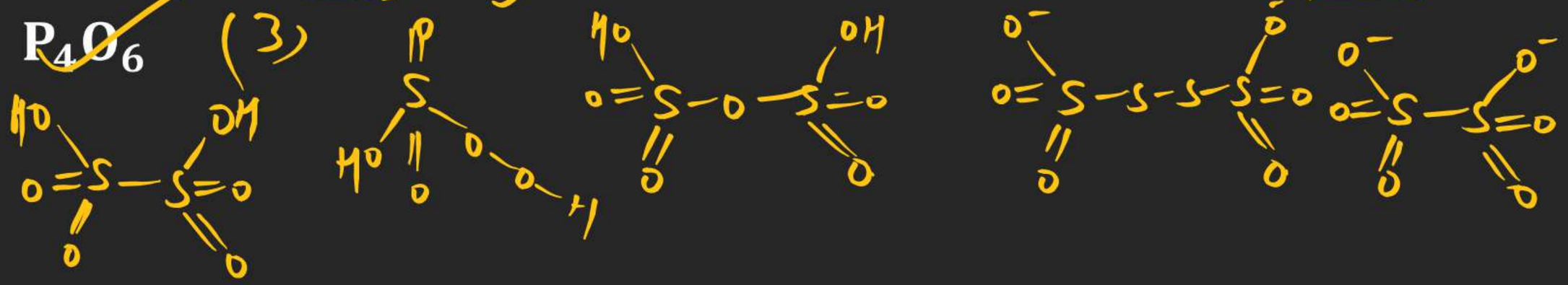
21. Total number of species among the following in which

$X - O - X$ linkage is present $[X = P, S]$

$H_2S_2O_6$, H_2SO_5, $H_2S_2O_7$, $H_2S_2O_8$, P_4O_{10}, $S_4O_6^{2-}$, $S_2O_6^{2-}$,

P_4O_6

(3)

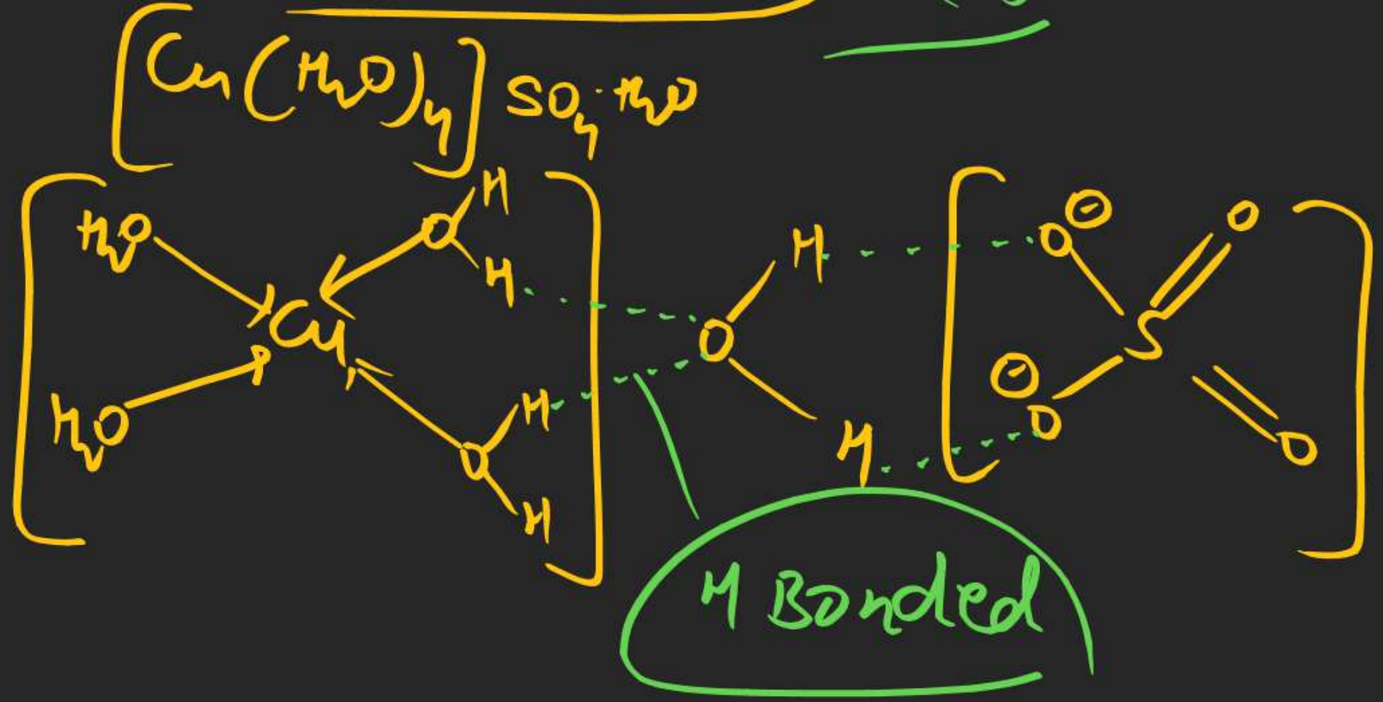


Chemical bonding

EXERCISE # 3

22. The number of water molecules(s) directly bonded to the metal centre in $CuSO_4 5H_2O$. is –

(4)



Chemical bonding

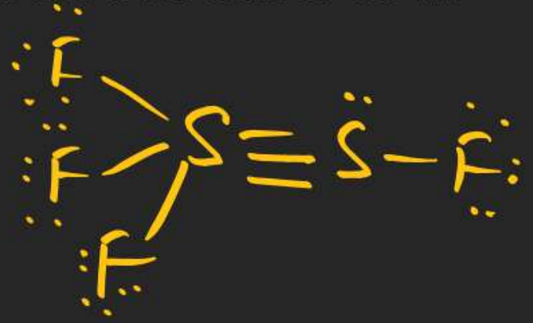
EXERCISE # 3

23. Observe the following statements about the structure of molecule F_3SSF

13 + 3 = 16

(a) Total number of lone, pairs present in molecule is x

(b) Number of $S-S$ bond present is y



Calculate the value of ' $x+y'$?

[Write your answer as sum of digits till you get the single digit answer]

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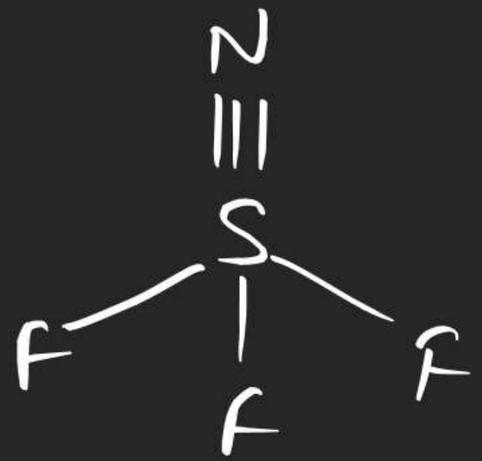
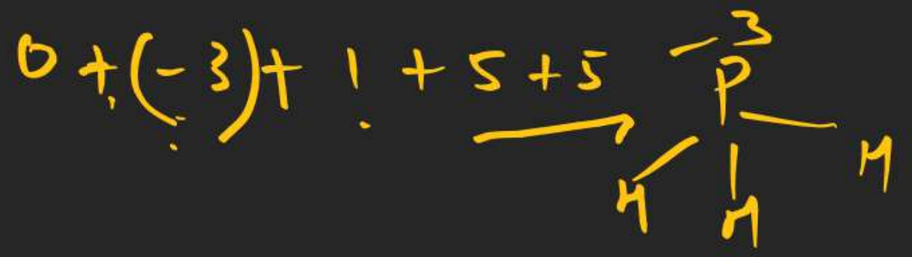
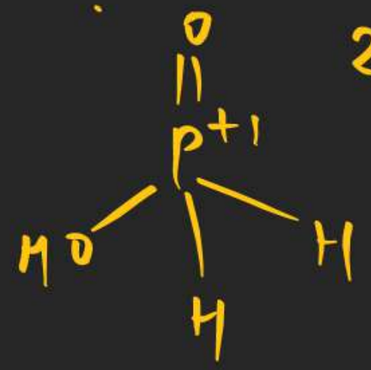


Chemical bonding

EXERCISE # 3

24. The sum of oxidation states of all P atoms in the following compound of phosphorus is P_4, PH_3, H_3PO_2, P_2O_5





$2x + 5(-2) = 0$

$2x = 10$

$x = +5$

Chemical bonding

EXERCISE # 3

25. How many of the following contains peroxy linkage in their structures : $S_2O_6^{-2}$, $S_2O_8^{-2}$, SO_5^{-2}, CrO_3

(2)

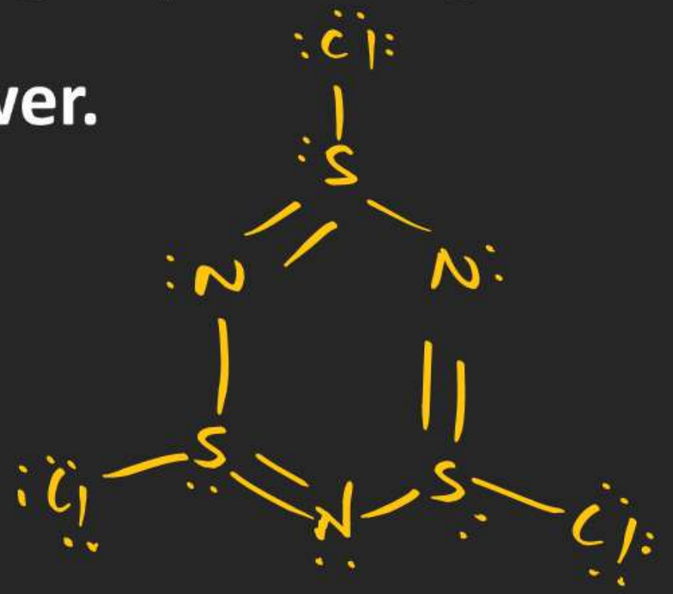
Chemical bonding

EXERCISE # 3

26. Find the number of lone pair in $N_3S_3Cl_3$.

Fill your answer as sum of digits (excluding decimal places) till you get the single digit answer.

15



Chemical bonding

EXERCISE # 3

27. Find the correct statements about $[NPCl_2]_3$ (phosphazene).

(i) Resonance structure can be drawn analogous to those for benzene indicating aromaticity in the rings.

(ii) The d_{xz} orbital of the phosphorous atom overlaps with the p_z orbitals of nitrogen atoms adjacent to it (if x is inter nucleuar axis).

(iii) $PNCl_2$ monomer is analogous to RCN.

(iv) σ/π ratio is 3 in $[NPCl_2]_3$.

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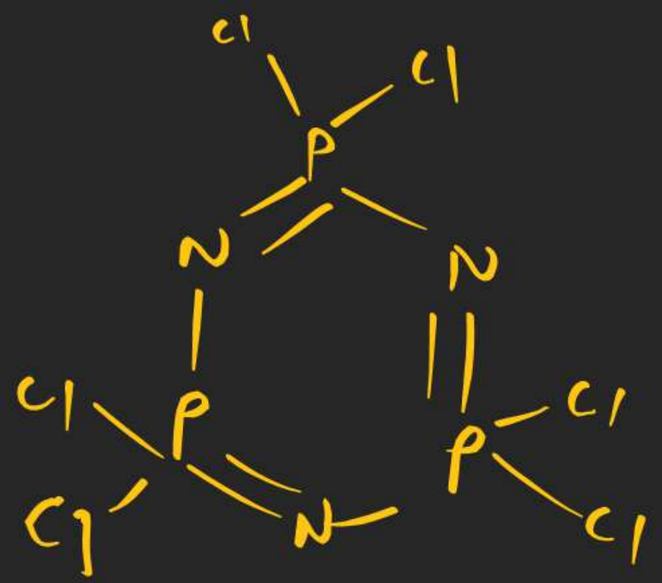
$N_3P_3Cl_6$

Hexa chlorophosphazene



Chemical bonding

EXERCISE # 3

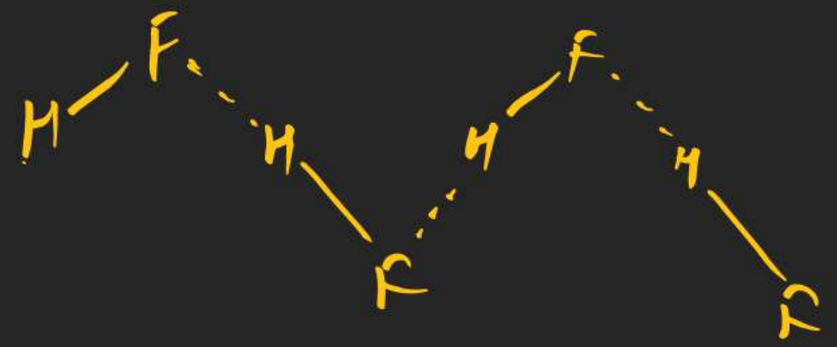
28. In tetrathionic acid number of $p_\pi - p_\pi$ bonds is :

Chemical bonding

EXERCISE # 3

29. In $(HF)_4$ the number of H bonds is .....

(3)



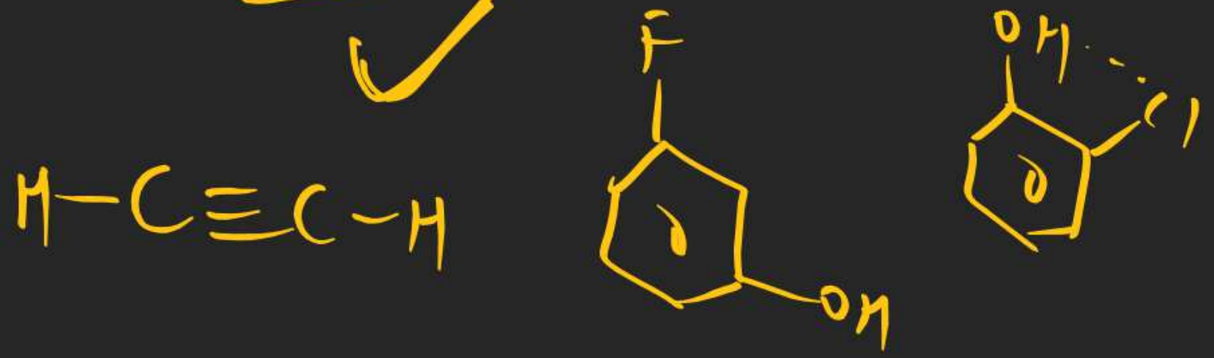
Chemical bonding

EXERCISE # 3

30. Total number of molecules which can have intermolecular hydrogen bonding ?

CH_3Cl, C_2H_2, C_2H_5OH, HCl, H_3PO_4, SiH_4,

metafluorophenol, orthochlorophenol.



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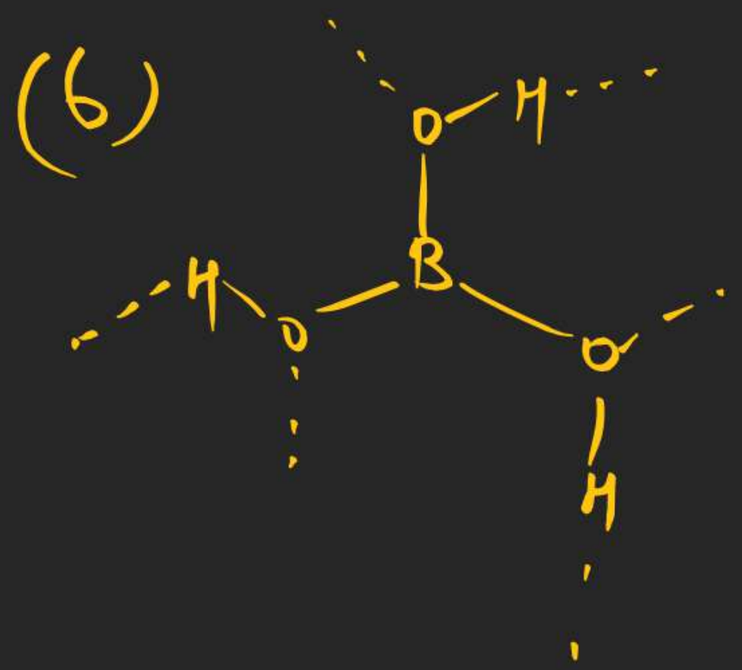
Chemical bonding

EXERCISE # 3

31. Find the number of H bond form by one boric acid in solid state



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Chemical bonding

EXERCISE # 3

32. Find the number of hexogonal rings in C_{60} fullerene.

Fill your answer as sum of digits till you get the single digit answer.

C_{80}

Hexagonal Rings

Pentagonal Rings

C_{60}

Hexagonal Rings $= 20$

Pentagonal Rings $= 12$ [fix]

number of Hexagonal Rings

$\frac{q}{2} = (n+10)$

n = no of hexagonal Rings

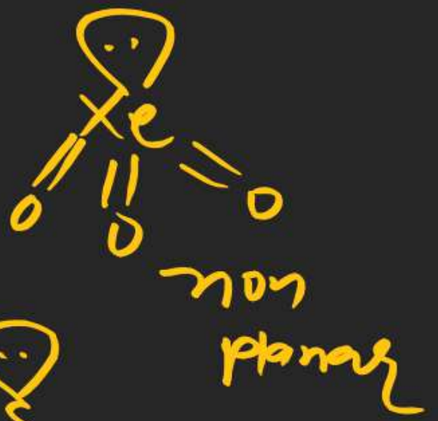
q = no of Carbon

Chemical bonding

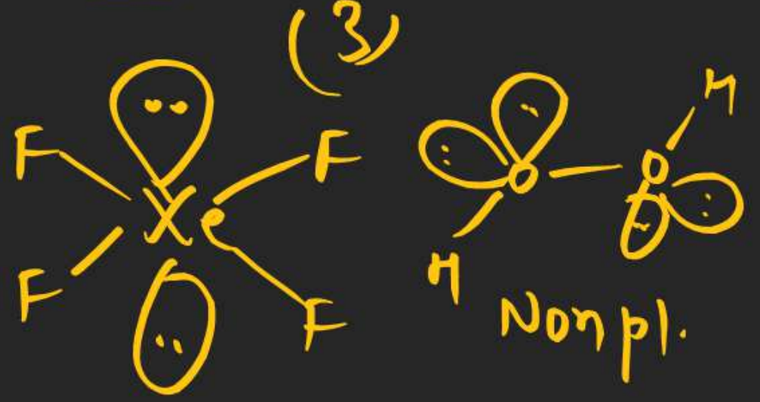
EXERCISE # 3

33. Number of following species which are planar & polar ?

$XeF_4, H_2O_2, H_2O, C_2H_4, ClF_3, SO_2, XeO_3$

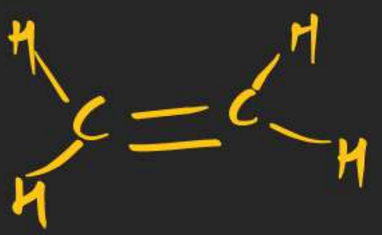


(3)



$\mu = 0$, nonpolar
Planar

$\mu = 0$
polar
Planar



$\mu = 0$
Non polar
Planar

$\mu = 0$
Polar
planar

$\mu = 0$
Polar
Planar

Chemical bonding

EXERCISE # 3

34. Find the number of chemical species(s) which are planar and nonpolar in the following:

(2) $NO_2^-, O_2F_2, XeF_5^+, HCN, XeF_5^-, B_3N_3H_6$