Chemical bonding

EXERCISE # 2

24. Select the INCORRECT Order ?

(A) $SO_3 < SO_3^{-2} < SO_4^{-2}$ ($S-O$ bond order)

(B) $CO > CO_2 > CO_3^{-2}$ ($C-O$ bond order)

(C) $CN^- < NCN^{-2} < RCNH_2$ ($C-N$ bond order)

(D) $ClO^- > ClO_2^- > ClO_3^- > ClO_4^-$) ($Cl-O$ bond order)

Chemical bonding

EXERCISE # 2

25. The correct order of bond dissociation energy will be ?

(A) $H - H > Cl - Cl > Br - Br$

(B) $Si - Si > P - P > Cl - Cl$

(C) $C - C > N - N > O - O$

(D) $F - F > Cl - Cl > Br - Br$

B.E ∝ 1/size

B.E ∝ 1/(l.p - l.p)

[only for 2nd period]

Chemical bonding

EXERCISE # 2

BF_3 PF_3 [Interhalogen → two type of Halogen]

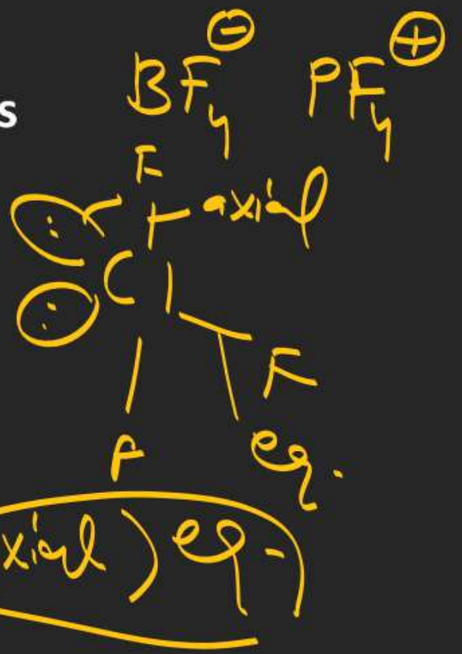
26. There are three elements X, Y and Z which belong to the p-block of periodic table they all form trifluorides with F_2, such that 'XF_3' is lewis acid but 'YF_3' is weak Lewis base (dipole moment $= 0.23D$). These two compounds react with each other in presence of F_2 to produce $YF_4{}^+XF_4{}^-$. The compound ZF_3 is a T-shape interhalogen molecule. Which of the following is/are correct statements with reference to above information?

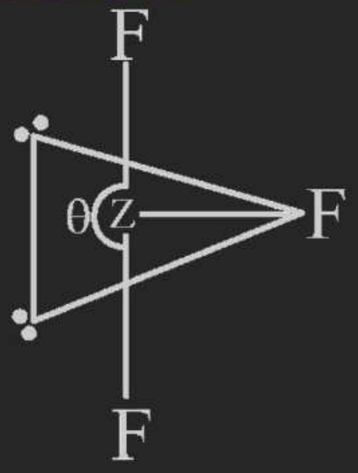
(A) All the $Z - F$ bond lengths are equal in ZF_3 molecules

(B) In the structure the angle $\theta \neq 180°$

(C) The Y and X both are sp^3 hybridised in $YF_4^+XF_4^-$

(D) The elements X, Y, Z can be B, N and Cl respectively





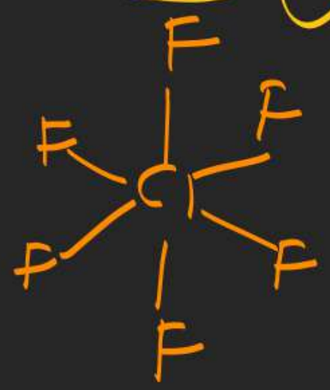
Chemical bonding

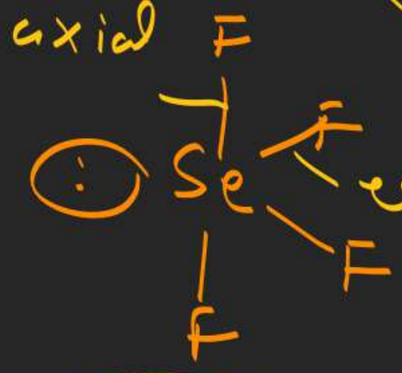
EXERCISE # 2

T.B.P → eq. B.L > axial B.L

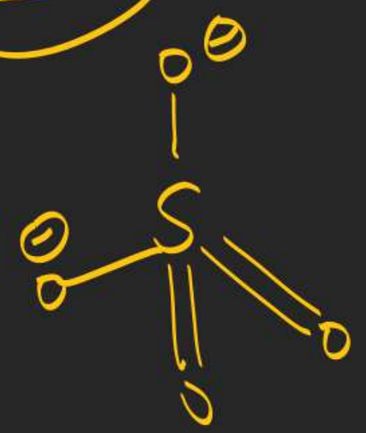
27. In which of the following species all bond lengths are not identical ?

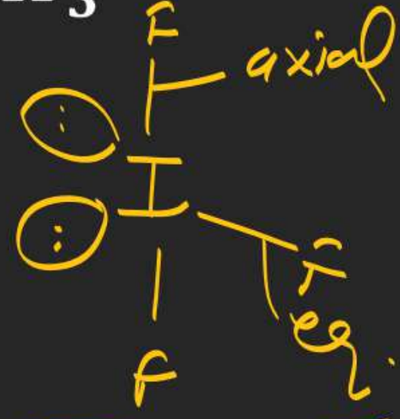
(A) ClF_6^+ (B) SeF_4 (C) SO_4^{-2} (D) IF_3





axial > eq.





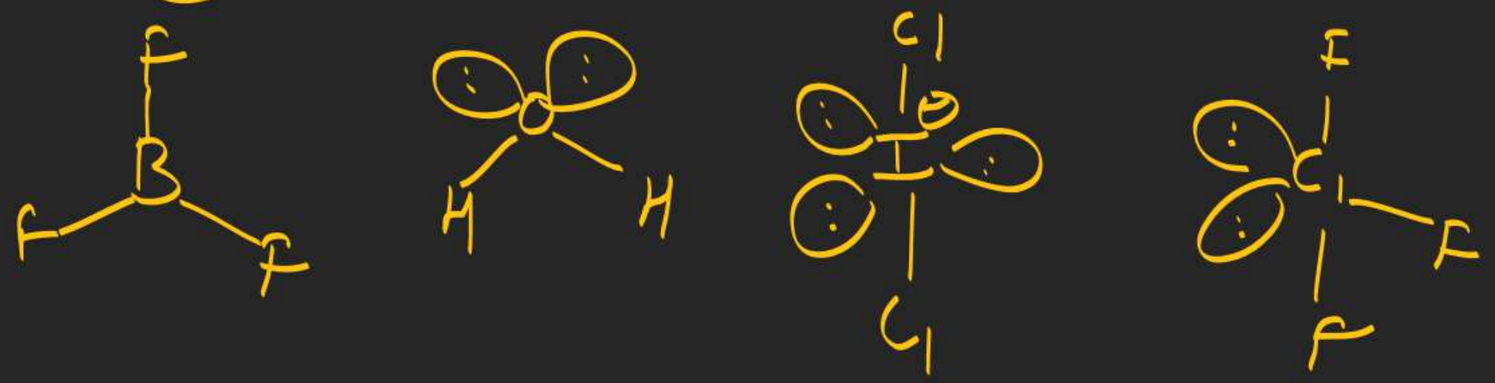
T.B.P → axial > eq.

Chemical bonding

EXERCISE # 2

28. Which of the following molecule(s) is/are planar

(A) BF_3 (B) H_2O (C) ICl_2^- (D) ClF_3



Chemical bonding

EXERCISE # 2

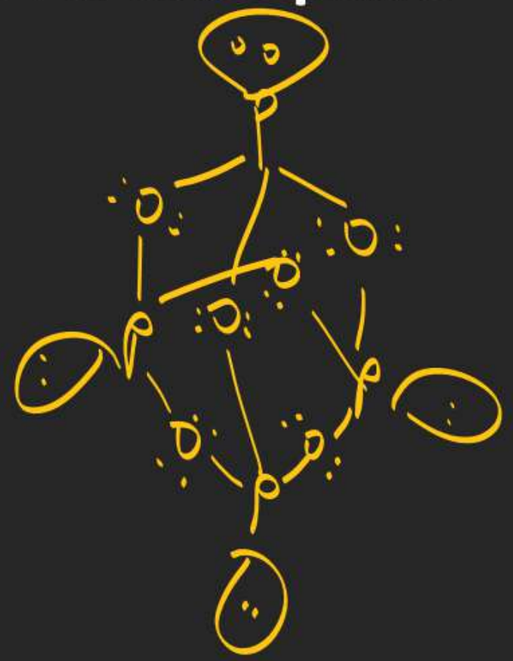
29. Which of the following statements is/are true for P_4O_6 molecule -

(A) It contains six P-O bonds and three P-P-bonds

(B) It contains six P-O-P linkage and 16 lone pairs

(C) It has all atoms sp^3-hybridised

(D) It has planar structure



Chemical bonding

EXERCISE # 2

30. Select the CORRECT statement about $C_3N_3(N_3)_3$ (cyanuric triazide) :

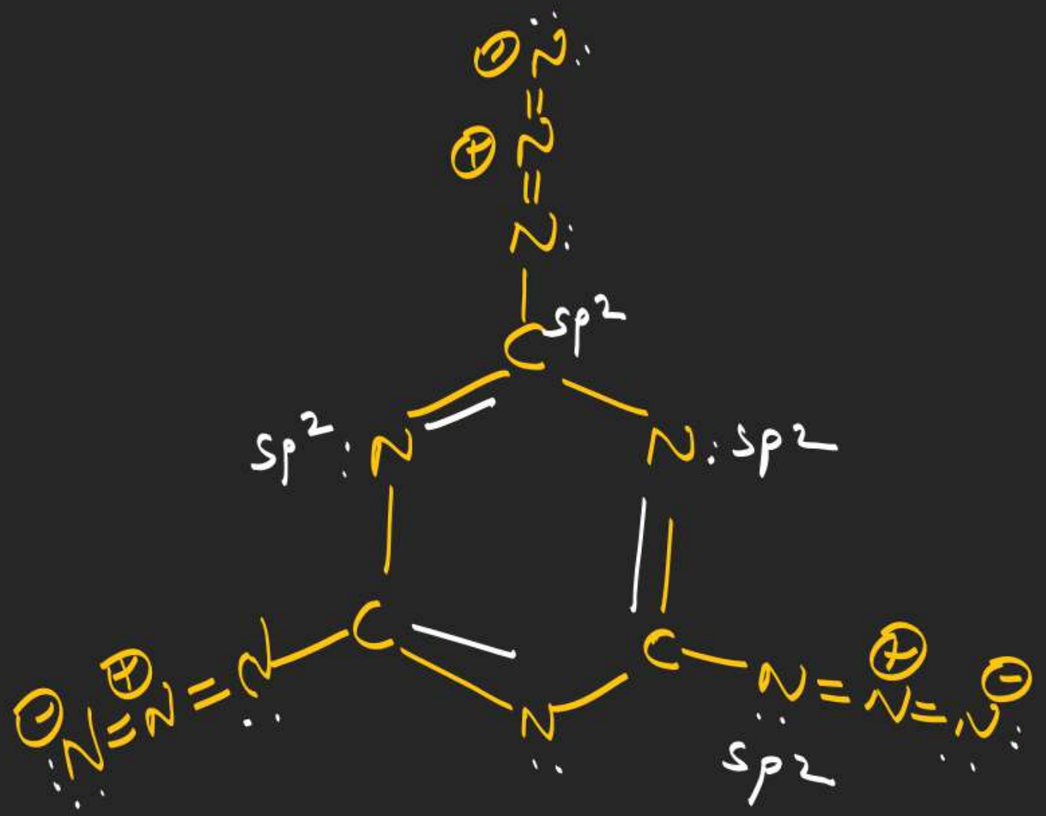
(A) Total number of sp^2 hybridized atom in the molecule is 12

(B) Total number of σ bond present in molecule is 15

(C) Total number of π bond present in molecule is 9

(D) Total number of lone pair present in molecule is 12

Nishant Jindal



Chemical bonding

EXERCISE # 2

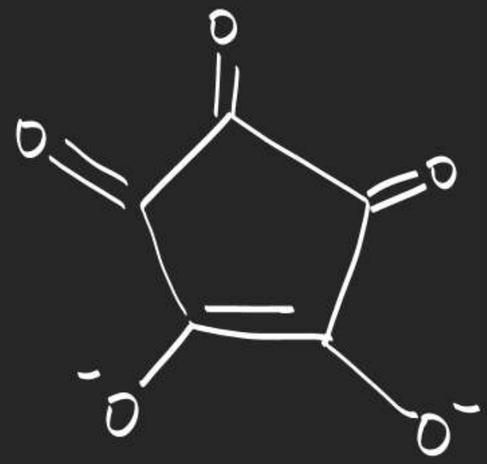
31. Find the correct statement about croconate ion $C_5O_5^{-2}$

(A) It is cyclic compound

(B) It is in particular aromatic and symmetric as the double bond and the negative charge become delocalized over the five CO units

(C) $C_5O_5^{-2}$ has four π bonds

(D) $C_5O_5^{-2}$ has three π bonds in rings.



Chemical bonding

EXERCISE # 2

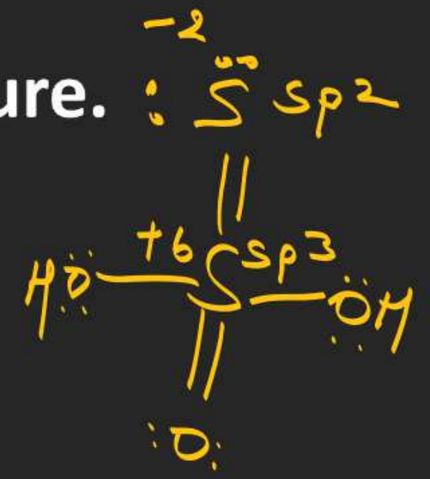
32. Select the INCORRECT statement(s) about the structure of $H_2S_2O_3$.

(A) Two $2p\pi - 3d\pi$ bonds present in the structure.

(B) Hybridization of each 'S' atom is sp^3

(C) Oxidation states of 'S' are $+6 \& -2$

(D) Total number of lone pair present in molecule is 8.



Chemical bonding

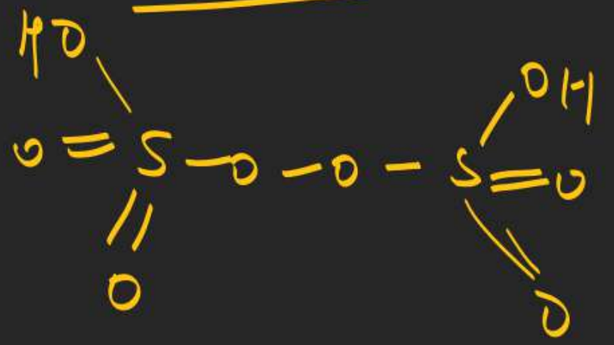
EXERCISE # 2

33. Which of the following oxy acid have per-oxy linkage :-

(A) $H_2S_2O_8$ **(B)** H_3PO_5 **(C)** HNO_3 **(D)** $H_2S_2O_3$

+5

Oxidation Rang out of Rang



Range

S = −2 to +6

Cl = −1 to +7

P = −3 to +5

O.S Range = n−8 to n

n = no of val. e⁻

Chemical bonding

EXERCISE # 2

34. Which of the following statement (s) is/are true about lone pair moments ?

(A) $sp > sp^2 > sp^3$: Order of lone pair moment

(B) The unshared pairs residing in pure s or p orbitals do not contribute to the resultant molecular polarity

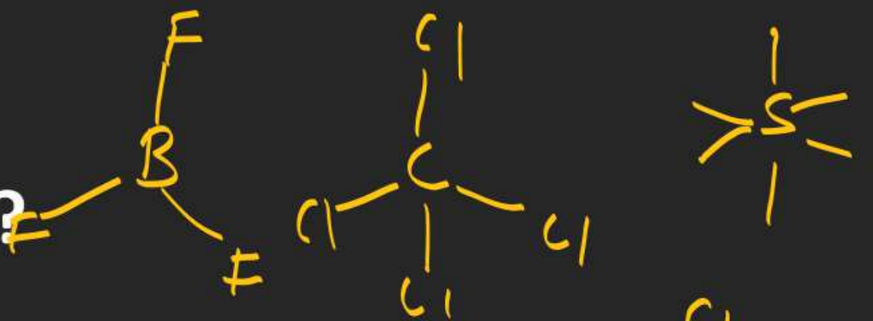
(C) The unshared pair residing in hybrid orbitals contributes to the resultant molecular polarity

(D) The lone pair moments acts in the opposite directions in which it is projected.

Chemical bonding

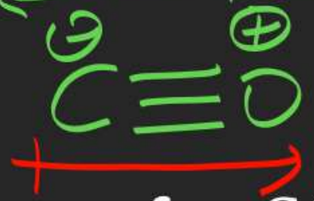
EXERCISE # 2

35. Correct Statement among following ?



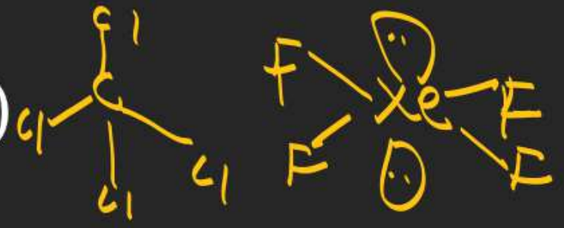
(A) Dipole moment order $BF_3 = CCl_4 = PCl_5 = SF_6$

(B) dipole moment of $CHCl_3 > CHF_3$



(C) $\mu_{experimental}$ is less than $\mu_{theoritical}$ for CO molecule

(D) If a AX_4 type molecule has $\mu = 0$ then it can have either tetrahedral or octahedral electron geometry (A = central atom, X = side atom)



$$CH_3Cl > CH_3F > CH_3Br > CH_3I$$

$$CH_3Cl > CH_2Cl_2 > CHCl_3 > CCl_4$$

Chemical bonding

EXERCISE # 2

36. Choose the INCORRECT order(s) of boiling point .

(A) $NH_3 > SbH_3 > AsH_3 > PH_3$

(B) $H_2O > TeH_2 > SeH_2 > SH_2$

(C) $HF > HI > HBr > HCl$

(D) $CH_4 > SnH_4 > GeH_4 > SiH_4$

Chemical bonding

EXERCISE # 2

37. Which of the following statement(s) is/are not correct ?

(A) Density of water increases from $0^\circ C$ to $4^\circ C$ then further increases on increasing the temperature

(B) Solid boric acid has 2-D sheet like structure due to intermolecular hydrogen bonding

(C) Urea has high boiling point due to intramolecular hydrogen bonding.

(D) HCl_2^- ion exists with Cs^+.

Chemical bonding

EXERCISE # 2

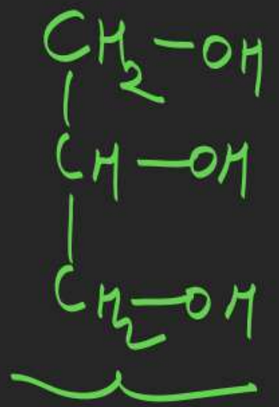
38. Hydrogen bonding is responsible for ?

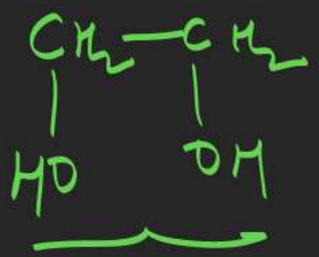
(A) Lower volatility of HF than that of HCl.

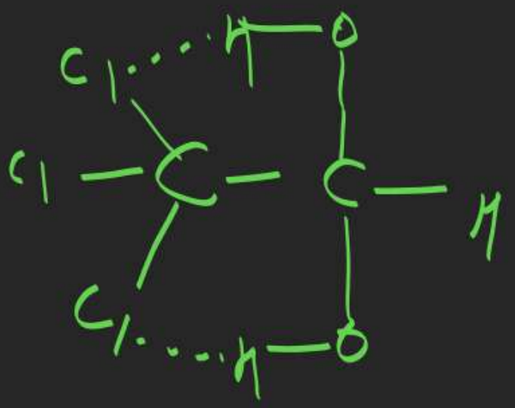
(B) More viscosity of glycerol than glycol.

(C) Stability of chloral hydrate

(D) High boiling point of SbH_3 than that of NH_3







Chemical bonding

EXERCISE # 2

39. Which of the following contain H-Bonding ?

(A) K_2HPO_4

(B) K_2HPO_3

(C) Chloral hydrate

(D) O-nitro phenol