Hydrogen Bonding - I

Nurture: Course on Chemical Bonding for Class XI 2023

Vishal joshi • Lesson 1 • Sept 16, 2021

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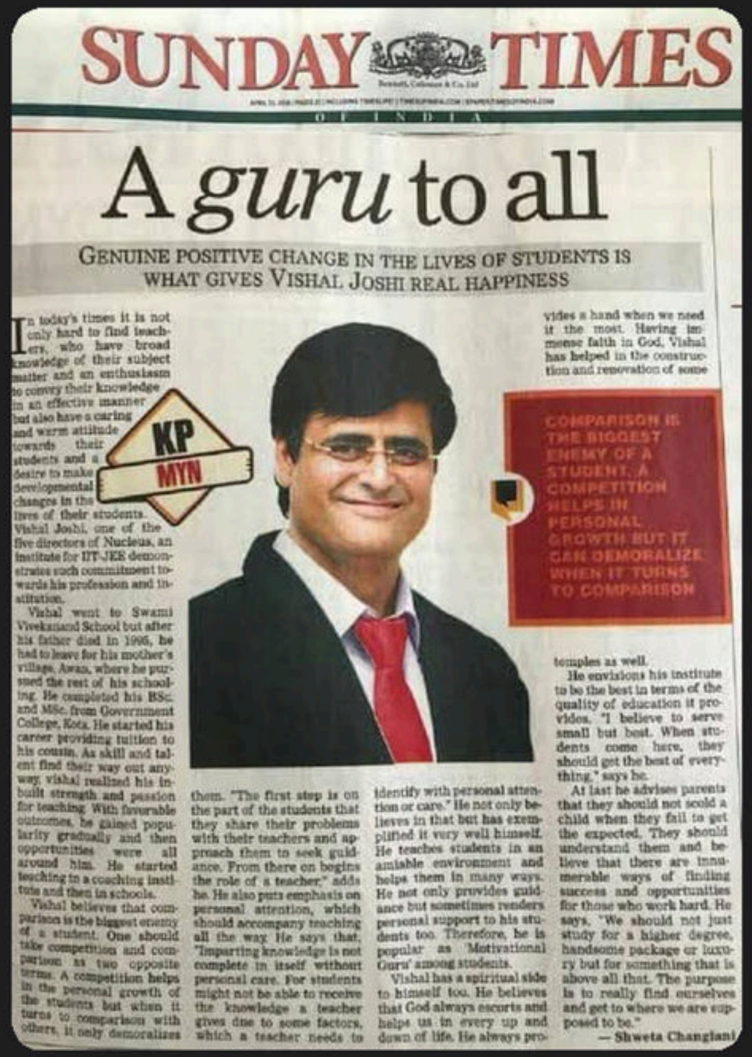
▲ 4 • Asked by Rakshit

op sir



SUNDAY TIMES

OF INDIA

A *guru* to all

GENUINE POSITIVE CHANGE IN THE LIVES OF STUDENTS IS WHAT GIVES VISHAL JOSHI REAL HAPPINESS

In today's times it is not only hard to find teachers, who have broad knowledge of their subject matter and an enthusiasm to convey their knowledge in an effective manner but also have a caring and warm attitude towards their students and a desire to make developmental changes in the lives of their students. Vishal Joshi, one of the five directors of Nucleus, an institute for IIT-JEE demonstrates such commitment towards his profession and institution.

Vishal went to Swami Vivekanand School but after his father died in 1995, he had to leave for his mother's village, Awan, where he pursued the rest of his schooling. He completed his BSc. and MSc. from Government College, Kota. He started his career providing tuition to his cousin. As skill and talent find their way out anyway, vishal realised his inbuilt strength and passion for teaching. With favourable outcomes, he gained popularity gradually and then opportunities were all around him. He started teaching in a coaching institute and then in schools.

Vishal believes that comparison is the biggest enemy of a student. One should take competition and comparison as two opposite terms. A competition helps in the personal growth of the students but when it turns to comparison with others, it only demoralizes them. "The first step is on the part of the students that they share their problems with their teachers and approach them to seek guidance. From there on begins the role of a teacher," adds he. He also puts emphasis on personal attention, which should accompany teaching all the way. He says that, "Imparting knowledge is not complete in itself without personal care. For students might not be able to receive the knowledge a teacher gives due to some factors, which a teacher needs to identify with personal attention or care." He not only believes in that but has exemplified it very well himself. He teaches students in an amiable environment and helps them in many ways. He not only provides guidance but sometimes renders personal support to his students too. Therefore, he is popular as 'Motivational Guru' among students.

Vishal has a spiritual side to himself too. He believes that God always escorts and helps us in every up and down of life. He always provides a hand when we need it the most. Having immense faith in God, Vishal has helped in the construction and renovation of some temples as well.

He envisions his institute to be the best in terms of the quality of education it provides. "I believe to serve small but best. When students come here, they should get the best of everything," says he.

At last he advises parents that they should not scold a child when they fail to get the expected. They should understand them and believe that there are innumerable ways of finding success and opportunities for those who work hard. He says, "We should not just study for a higher degree, handsome package or luxury but for something that is above all that. The purpose is to really find ourselves and get to where we are supposed to be."

— Shweta Changlani

KP MYN

COMPARISON IS THE BIGGEST ENEMY OF A STUDENT. A COMPETITION HELPS IN PERSONAL GROWTH BUT IT CAN DEMORALIZE WHEN IT TURNS TO COMPARISON

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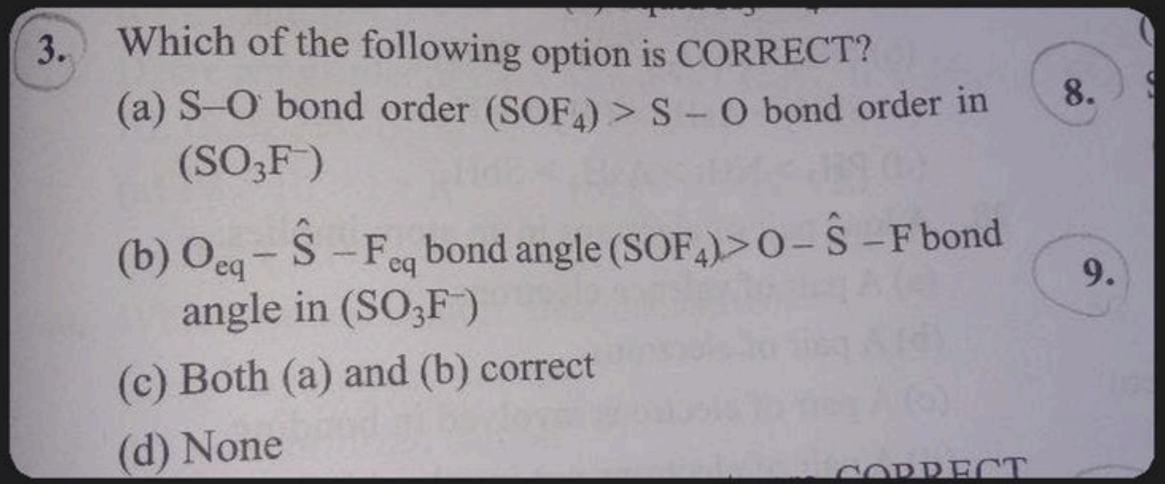
▲ 3 • Asked by Prasad

Sir 2nd option samaz nhi aya



3. Which of the following option is CORRECT?

(a) S–O bond order (SOF_4) > S – O bond order in (SO_3F^-)

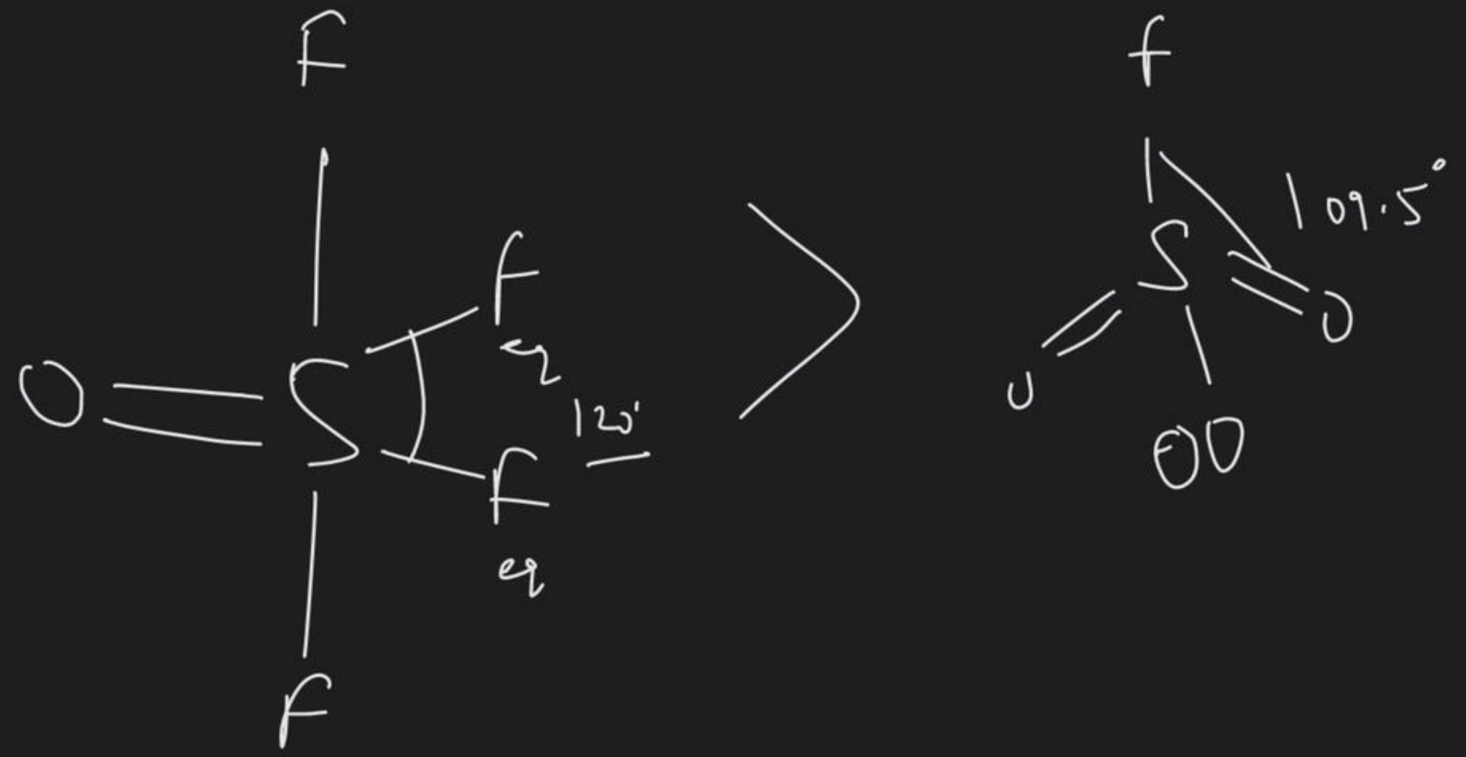
(b) $O_{eq} - \hat{S} - F_{eq}$ bond angle (SOF_4) > O – $\hat{S}$ – F bond angle in (SO_3F^-)

(c) Both (a) and (b) correct

(d) None

8.

9.


f
f
eq
120°
f
eq
O
S
f
O
S
O
O
109.5°
OO

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▲ 6 • Asked by Aaditya Ag...

Please help me with this doubt

SO_4^{2-}

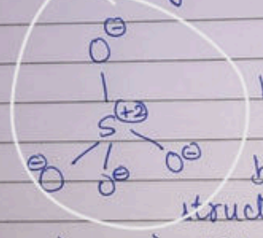
$n_1 = 6 + (6 \times 4) + 2 = 32$

$n_2 = 8 \times 5 = 40$

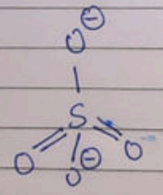
$n_3 = 8$

$n_4 = 16$

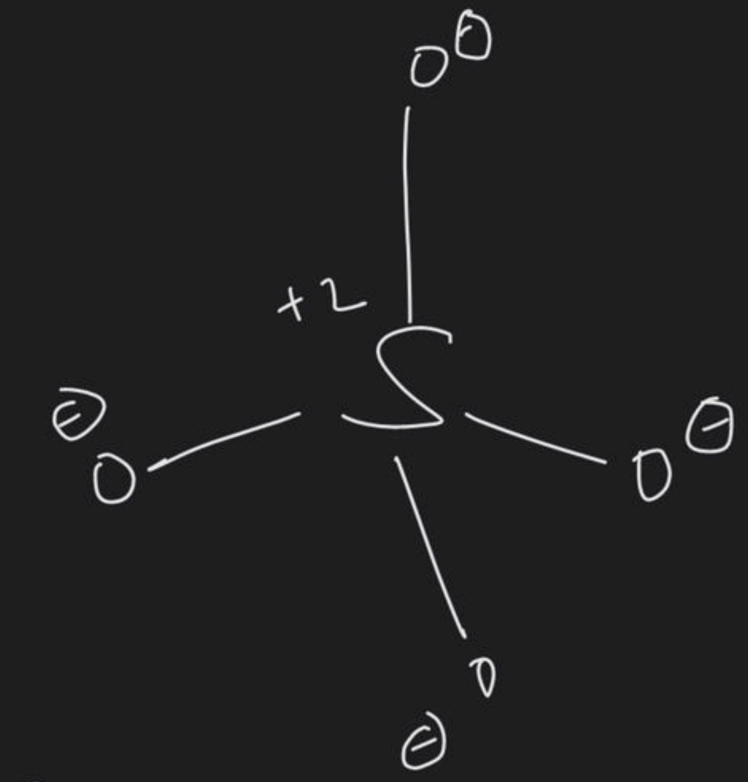
no of bonds $= \frac{n_3}{2} = 4$



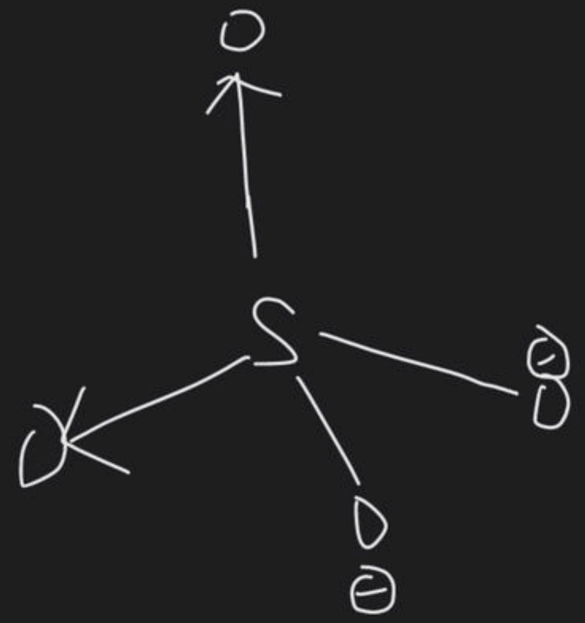
but everywhere the structure of SO_4^{2-} which is given is diff



This is given everywhere So sir which one is correct & please sir, what is wrong in 1st one.



acc. to lewis



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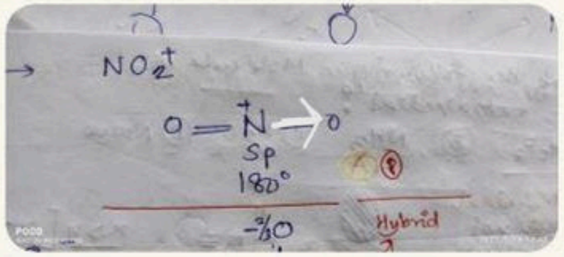
▲ 7 • Asked by Aritra Amb...

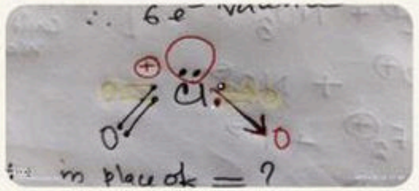
Please help me with this doubt

Sir agar Any Atom ke Upar Charge(+ or -) aa gaya Ex- N+ then Wo toh Apna Covalency/ Aukat se Bahar bhi Covalently Bond bana sakta hai na w/o coordinate (eg NO2+ Me N+ 4 bond bana sakta hai But "N" ka Covalency ONLY 3 hai).



Created with Mi Notes

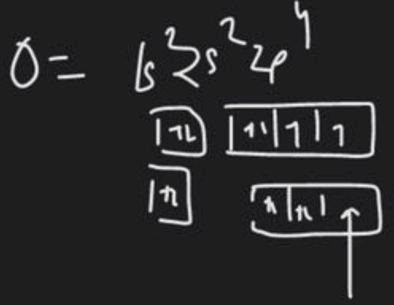
But Sir



ClO2+ me Sir Cl Ek O ke sath Already Cl=O bana chuka hai..now He had 2 options, either make Cl=O with rem. O or Give Cl -:-->O. He preferred 2nd Options because "Cl" Covalency 1,3,5,7...So Now He's Making 3 Covalent Bonds.....

BUT AGAR NO2+ WALE EXAMPLE SE LOGIC DEKHE THEN AGAR WO CL=O BHI BANATA APNE AUKAT SE BAHAR JAKE(LIKE THAT N+ "N" KE AUKAT SE BAHAR JAKE 4 BOND BANAYA THA) THEN DIFFERENCE HOTA KYA AS CL HAS + ON IT)

Created with Mi Notes



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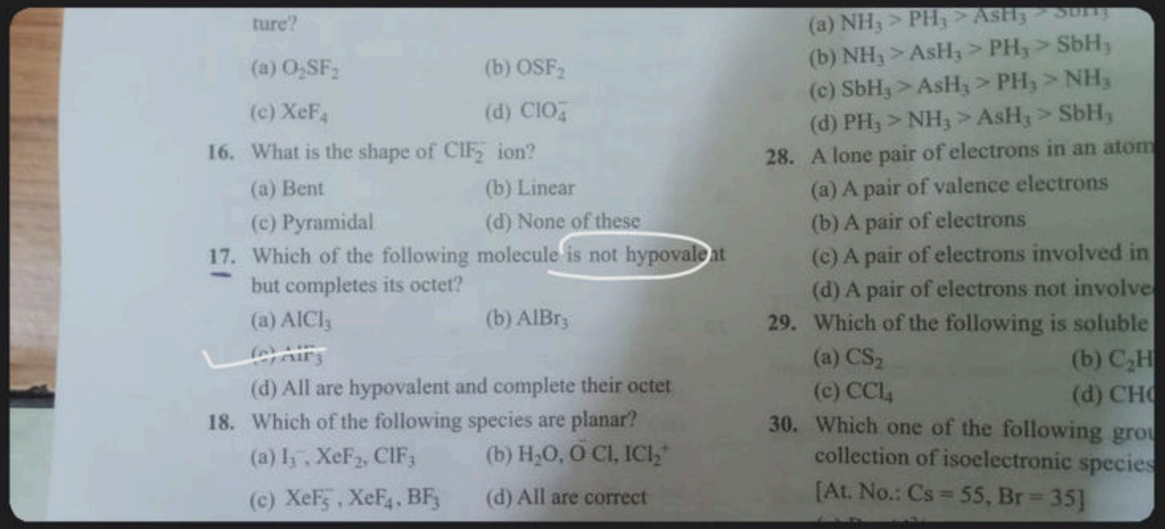
▲ 3 • Asked by Shivesh

doubt 17



ture?

(a) O_2SF_2 (b) OSF_2

(c) XeF_4 (d) ClO_4^-

16. What is the shape of ClF_2^- ion?

(a) Bent (b) Linear

(c) Pyramidal (d) None of these

17. Which of the following molecule is not hypovalent but completes its octet?

(a) $AlCl_3$ (b) $AlBr_3$

(c) AlF_3

(d) All are hypovalent and complete their octet

18. Which of the following species are planar?

(a) I_3^-, XeF_2, ClF_3 (b) H_2O, $\bar{O}Cl$, ICl_2^+

(c) XeF_5^-, XeF_4, BF_3 (d) All are correct

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

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

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

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

28. A lone pair of electrons in an atom

(a) A pair of valence electrons

(b) A pair of electrons

(c) A pair of electrons involved in

(d) A pair of electrons not involve

29. Which of the following is soluble

(a) CS_2 (b) C_2H

(c) CCl_4 (d) CH

30. Which one of the following grou collection of isoelectronic species [At. No.: Cs = 55, Br = 35]

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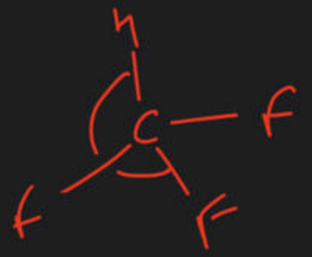
▲ 3 • Asked by Sounak

Please help me with this doubt

52. In which of following cases, the central atom is not perfectly sp^3 hybridised?

(A) BF_4^- (B) SiF_4 (C) CHF_3 (D) CCl_4



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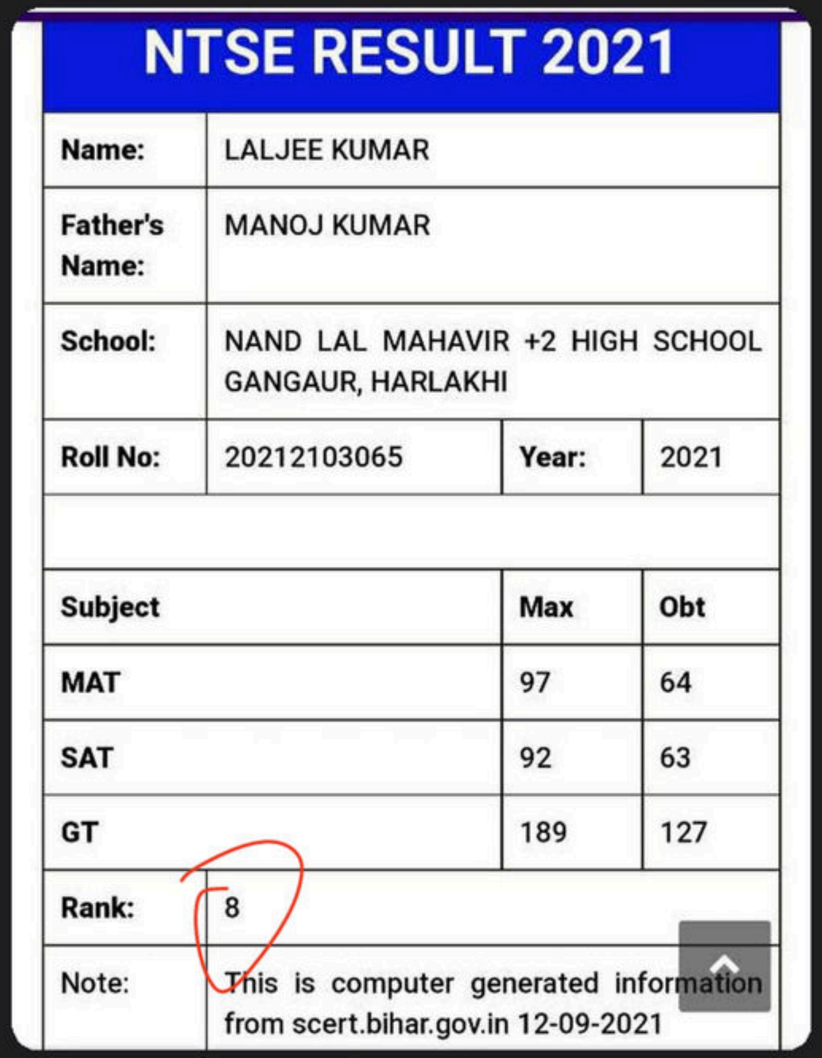
▲ 9 • Asked by Laljee

Please help me with this doubt



NTSE RESULT 2021

Name:	LALJEE KUMAR		
Father's Name:	MANOJ KUMAR		
School:	NAND LAL MAHAVIR +2 HIGH SCHOOL GANGAUR, HARLAKHI		
Roll No:	20212103065	**Year:**	2021
Subject		**Max**	**Obt**
MAT		97	64
SAT		92	63
GT		189	127
Rank:	8		
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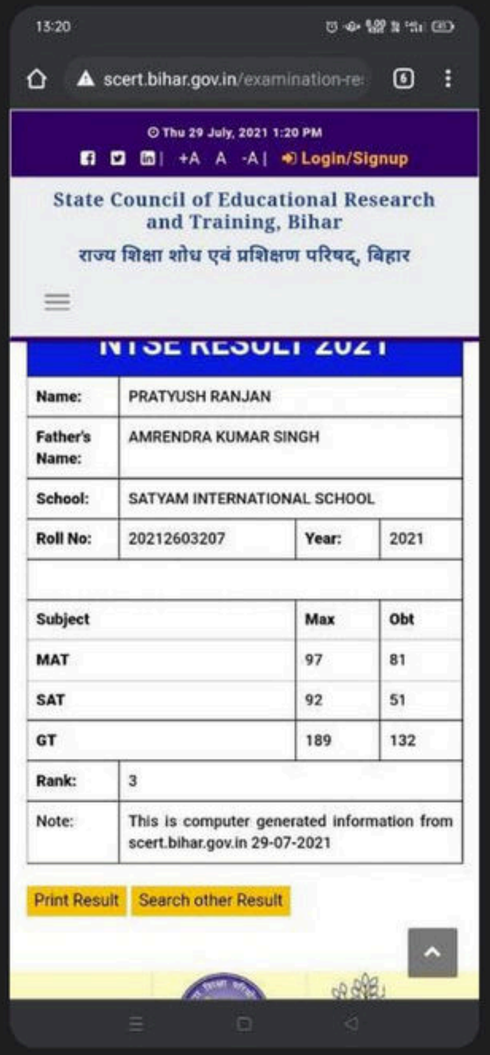
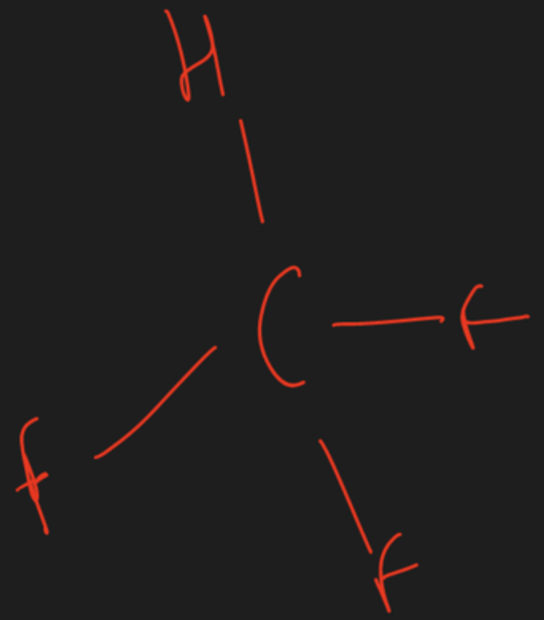
▲ 4 • Asked by Pratyush

Please help me with this doubt



CHF_3



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▲ 4 • Asked by Bobbyxi

1D ka matlab debye hai kya??

9.2 Inorganic Chemistry

(i) $PbCl_4$ (ii) SbF_6^- (iii) BH_4^- (iv) PCl_3

(a) Tetrahedral sp^2, octahedral sp^3d^2, tetrahedral sp^3, tetrahedral sp^3, respectively

(b) Tetrahedral sp^3, octahedral sp^3d^2, tetrahedral sp^3, tetrahedral sp^3, respectively

(c) Tetrahedral sp^3, octahedral sp^3d^2, tetrahedral sp^3, pyramidal sp^3, respectively

(d) Trigonal planar sp^2, octahedral sp^3d^2, tetrahedral sp, tetrahedral sp^2, respectively

12. What is the value of 1D in SI units?

(a) 3.336×10^{-30} cm (b) 33.36×10^{-30} cm

(c) 333.6×10^{-30} cm (d) None of these

13. Arrange the following types of interactions in order of increasing stability (covalent, van der Waals' force, hydrogen bonding):

(a) Hydrogen bonding < covalent < van der Waals' force

(b) Covalent < hydrogen bonding < van der Waals'

(a) BCl_3

(c) CF_4

20. The pair having

(a) BH_3, NH_3

(c) CH_4, CCl_4

21. Which of the fo

(a) CF_4

(c) CH_4

22. Which of the geometries?

(a) CH_4, CCl_4

(c) H_2O, H_2S

23. Which type o

(a) V-shaped

(c) Linear

24. Which of the pyramidal sh

(a) BF_3

(c) NO_3^-

25. Graphite h

cm

$1D = 10^{-18}$ esu x cm

$= 3.33 \times 10^{-30}$ C.M

C.M

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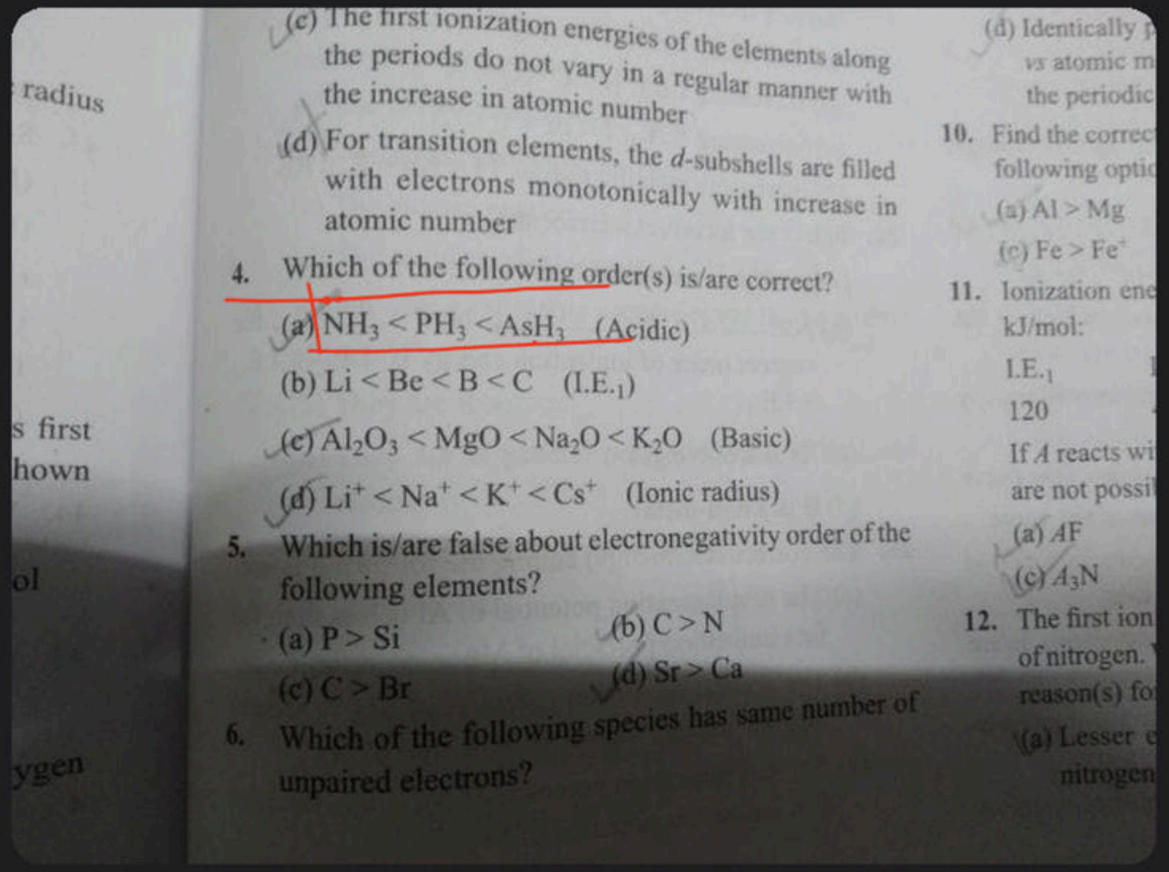
▲ 3 • Asked by Arsh

Sir isme option A kaise correct hai?



(c) The first ionization energies of the elements along the periods do not vary in a regular manner with the increase in atomic number

(d) For transition elements, the *d*-subshells are filled with electrons monotonically with increase in atomic number

4. Which of the following order(s) is/are correct?

(a) $NH_3 < PH_3 < AsH_3$ (Acidic)

(b) $Li < Be < B < C$ ($I.E._1$)

(c) $Al_2O_3 < MgO < Na_2O < K_2O$ (Basic)

(d) $Li^+ < Na^+ < K^+ < Cs^+$ (Ionic radius)

5. Which is/are false about electronegativity order of the following elements?

(a) P > Si (b) C > N

(c) C > Br (d) Sr > Ca

6. Which of the following species has same number of unpaired electrons?

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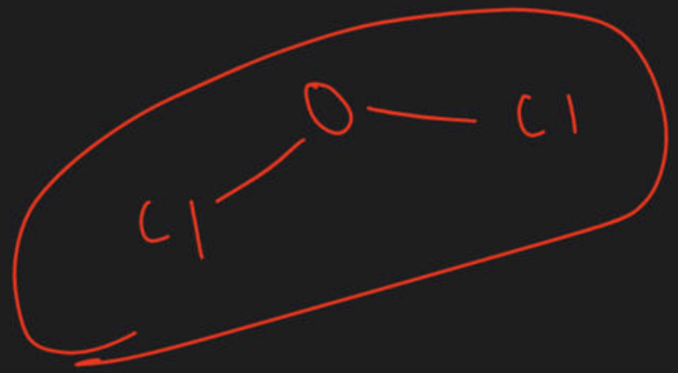
▲ 12 • Asked by Aaditya Ag...

Please help me with this doubt

Sir O and Cl m se central atom kaunsa hoga kyonki kabhi O lia h aur kabhi Cl jaise OCl2 m O lia tha central atom aur jaise HCLO4 m Cl lia jaata h Central atom



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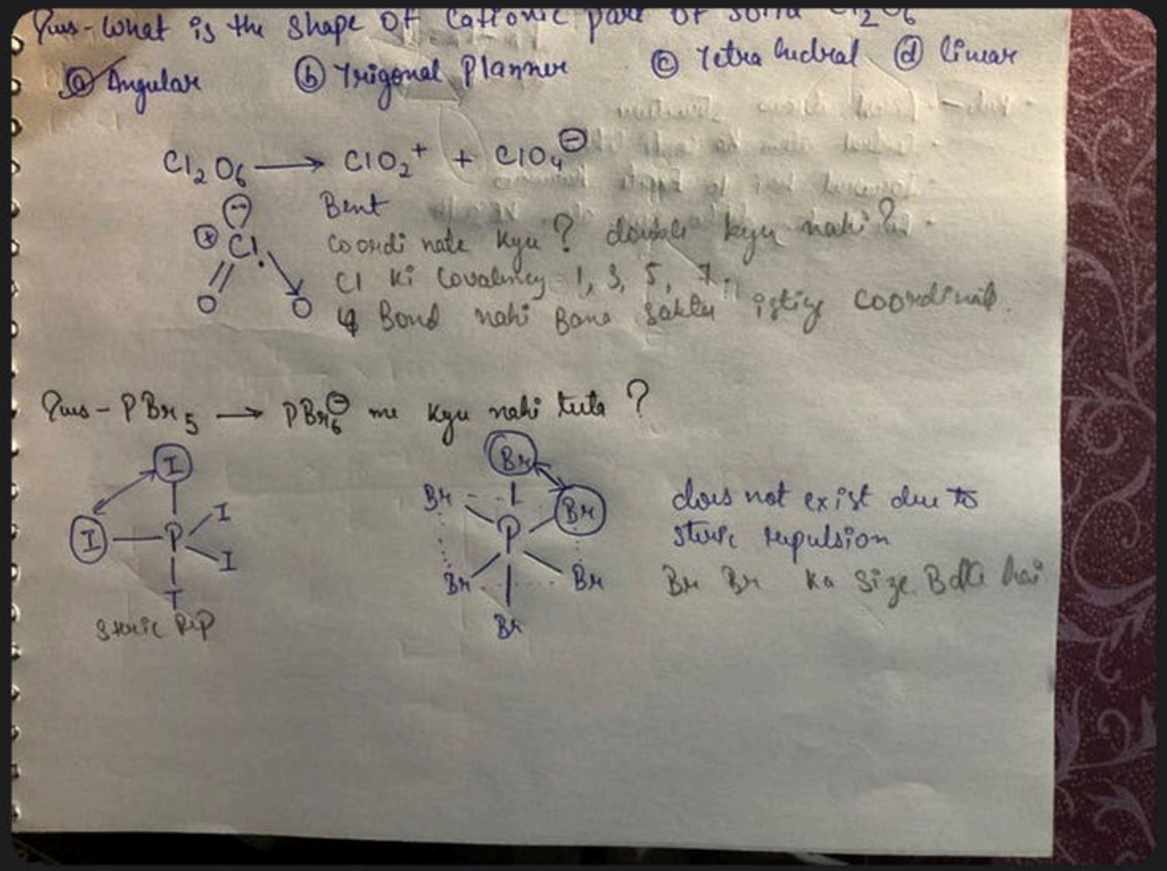
▲ 3 • Asked by Manthan

Sir aapne likhwaya tha ki steric rep unn structure pe lgega jo bich me 2nd period ke CA aur 3rd 4th 5th period ke SR contain krte h...to usme br or i ke size se kyu dekha?



Hydrogen bonding

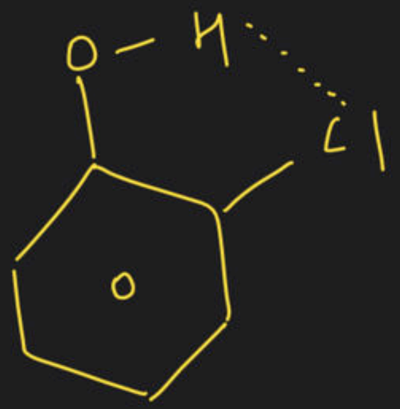
H—H

8 KJ/mole 42 KJ/mole

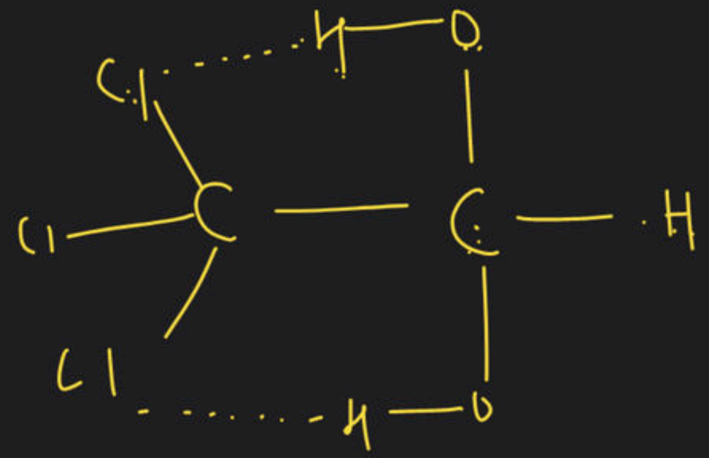
V.W.f | H Bonding | Chemical bonding

it is formed by F, O N

Sometimes Cl



Ortho-Chlorophenol



Chloralhydrate

$CCl_3CHO \cdot H_2O$

Q4 Order of Strength of H-Bonding

$F\cdots H^{x}\cdots F$ > $O-H^{y}\cdots F$ > $\underline{N}-H^{z}\cdots F$

H-Bond strength $\propto$ E.N diff

Q5 Order of B.L

(1) $x > y > z$ ~~(2) $x < y < z$~~

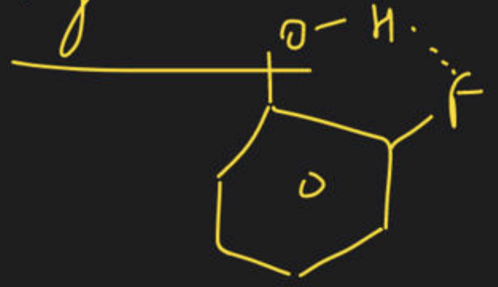
(3) $x = y = z$ (4) none

Type of H-Bonding ⇒

Intra

Chelate Ring

With in molecule

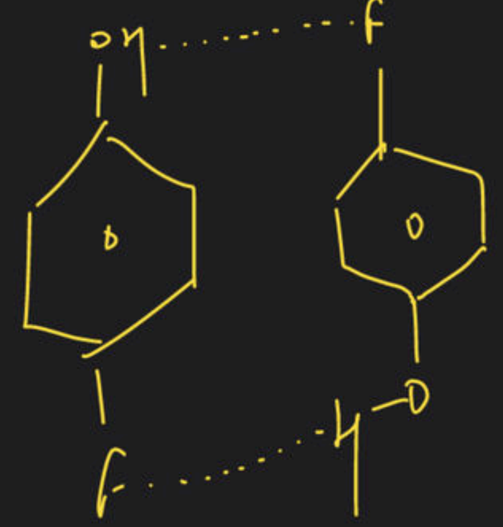


(Ortho fluoro phenol)

Chelation occurs

Inter

between molecule

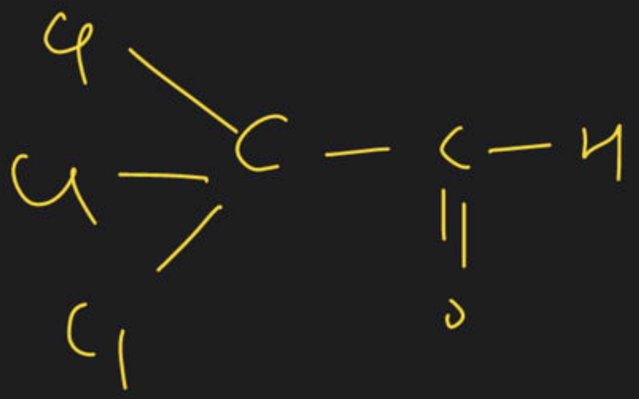


Association

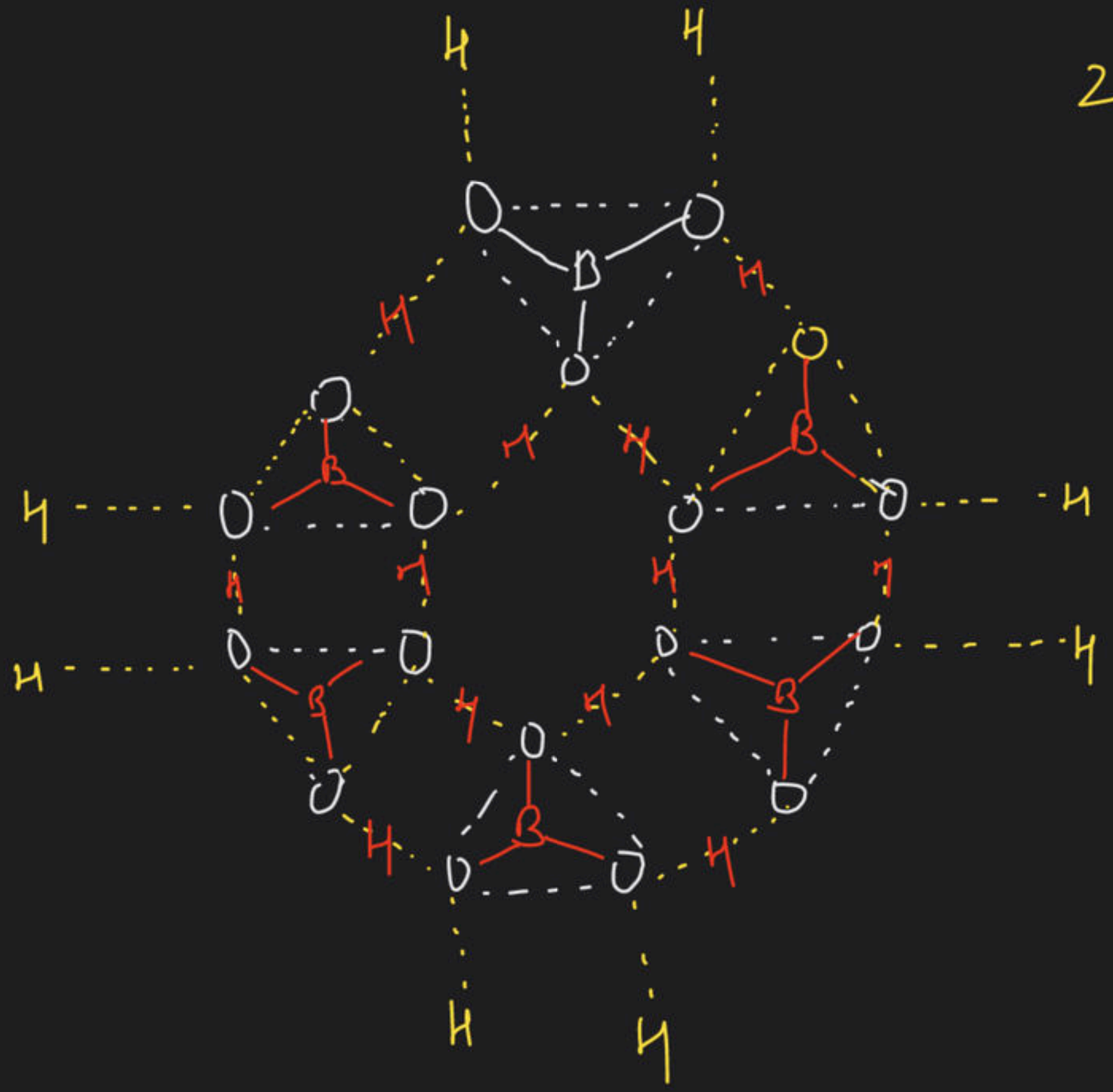
Que Which of the following Compound can not form H-Bonding

(1) CCl_3CHO (2) HF (3) H_2O (4) all can form

HF

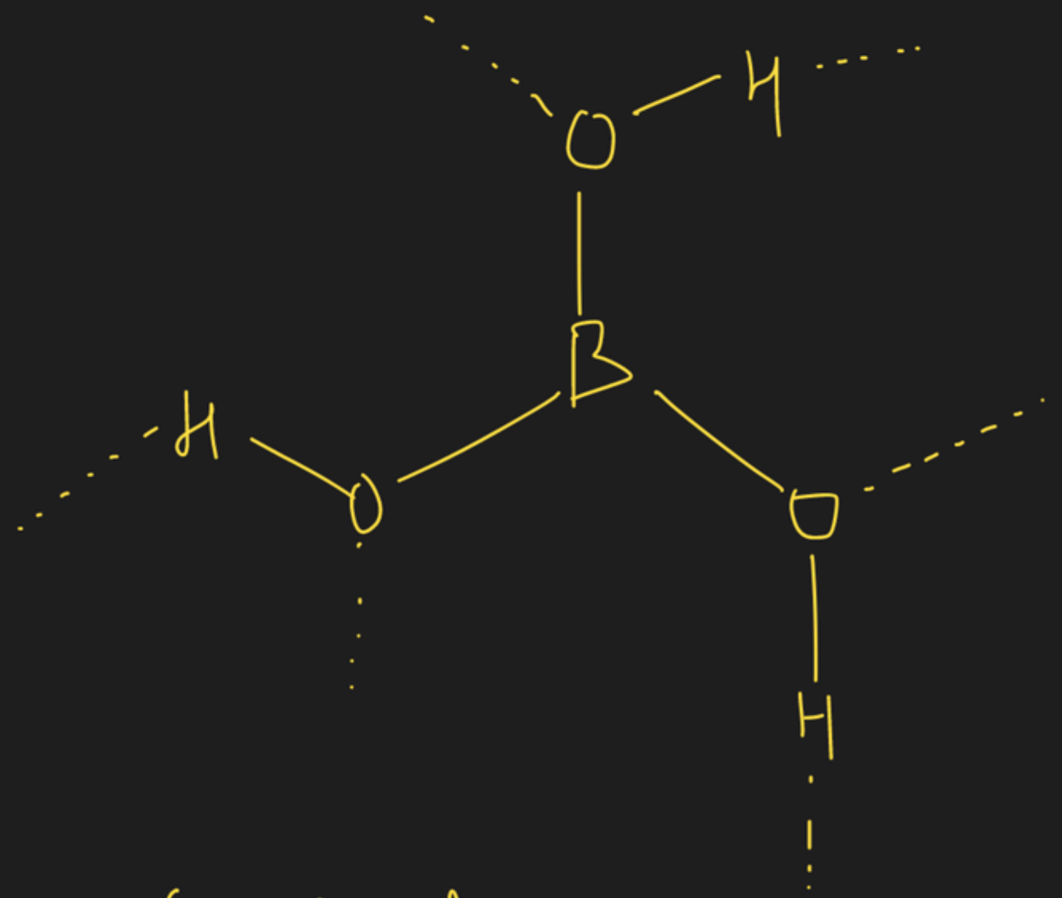


Solid Boric structure :-



2D sheet like structure

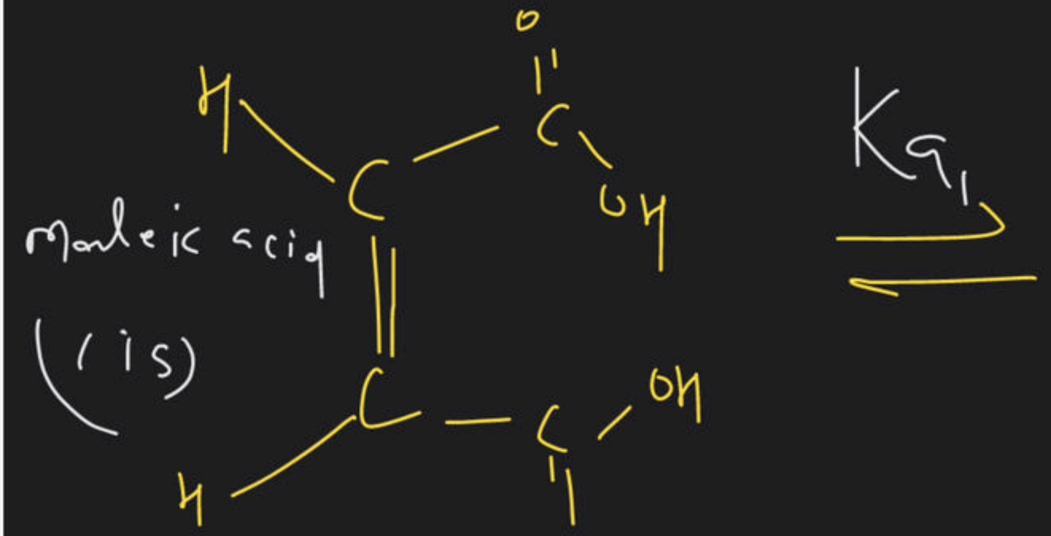
planar



Δ

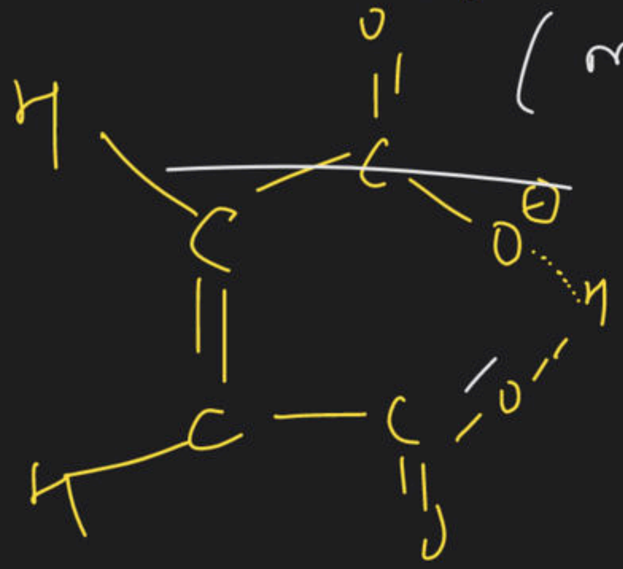
G-H Bonding

maleic acid and fumeric acid



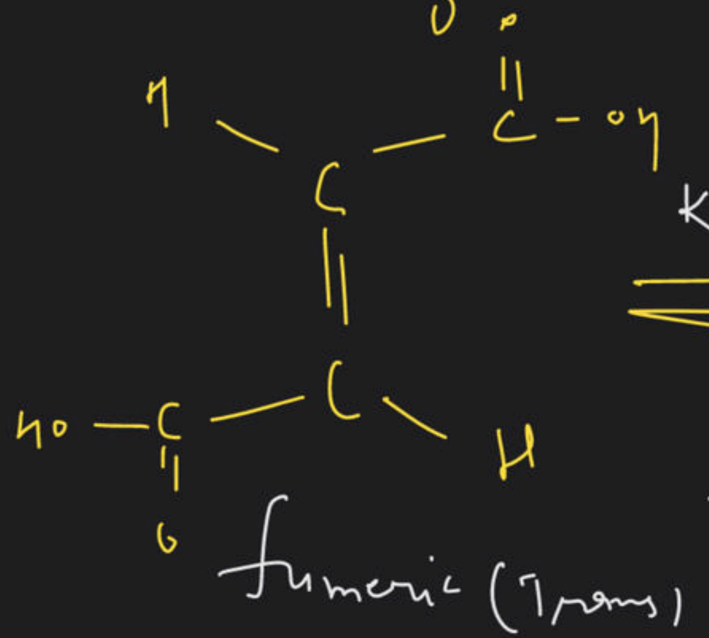
maleic acid
(cis)

K_{a_1}



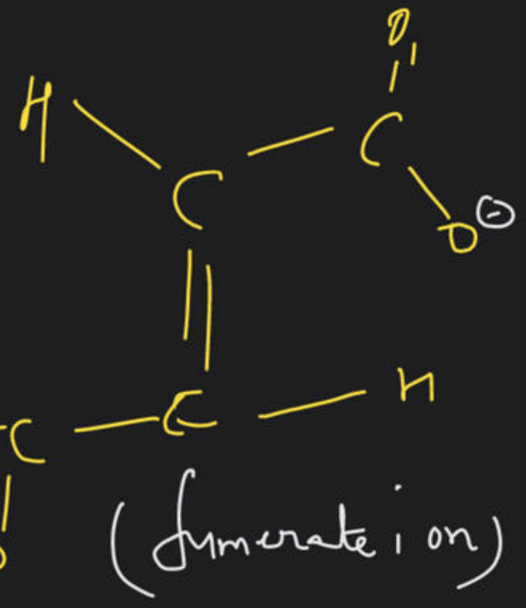
(maleate ion)

+ H^+



fumeric (trans)

K_{a_1}



(fumerate ion)

+ H^+

F O N

acidic nature maleic > fumeric

K_{a_1} of maleic > K_{a_1} fumeric

K_{a_2} of maleic K_{a_2} of fumeric

(i) (ii)