

P-BLOCK

2023

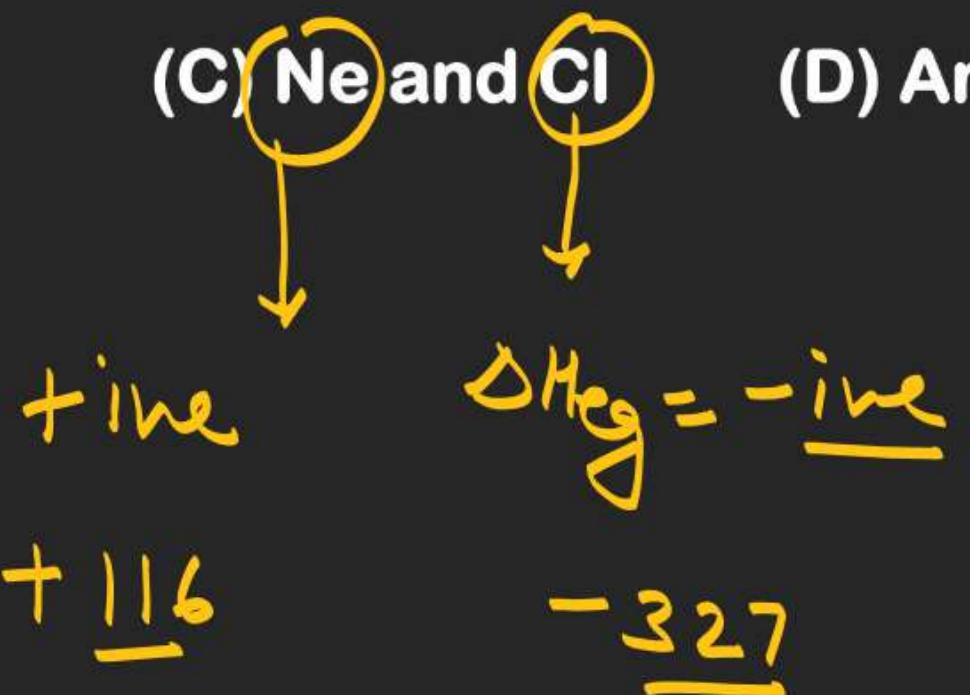
1. The difference between electron gain enthalpies will be maximum between :

(A) Ne and F

(B) Ar and F

(C) Ne and Cl

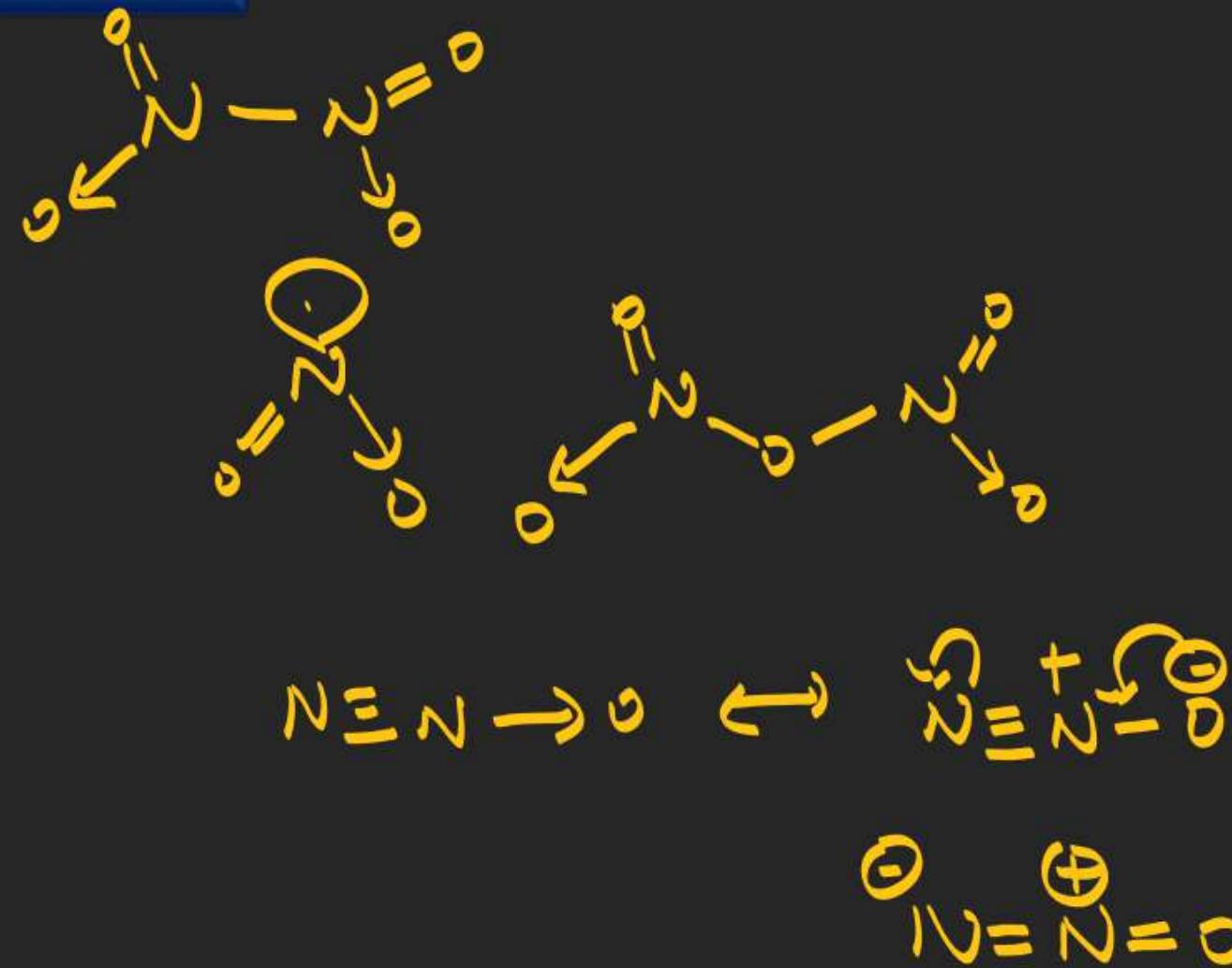
(D) Ar and Cl



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2. Match List I with List II

	List I Oxide		List II Type of bond
A	N_2O_4	I	1 N = O bond
B	NO_2	II	1 N - O - N bond
C	N_2O_5	III	N - N bond
D	N_2O	IV	1 N = N/N \equiv N bond



Choose the correct answer from the options given below :

(A) A - III, B - I, C - II, D - IV

(C) A - III, B - I, C - IV, D - II

(B) A - II, B - IV, C - III, D - I

(D) A-II, B-I, C-III, D-IV

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3. XeF_4 reacts with SbF_5 to form $[\text{XeF}_m]^{n+} [\text{SbF}_y]^{z-}$ $m + n + y + z = ?$.



$$m = 3$$

$$n = 1$$

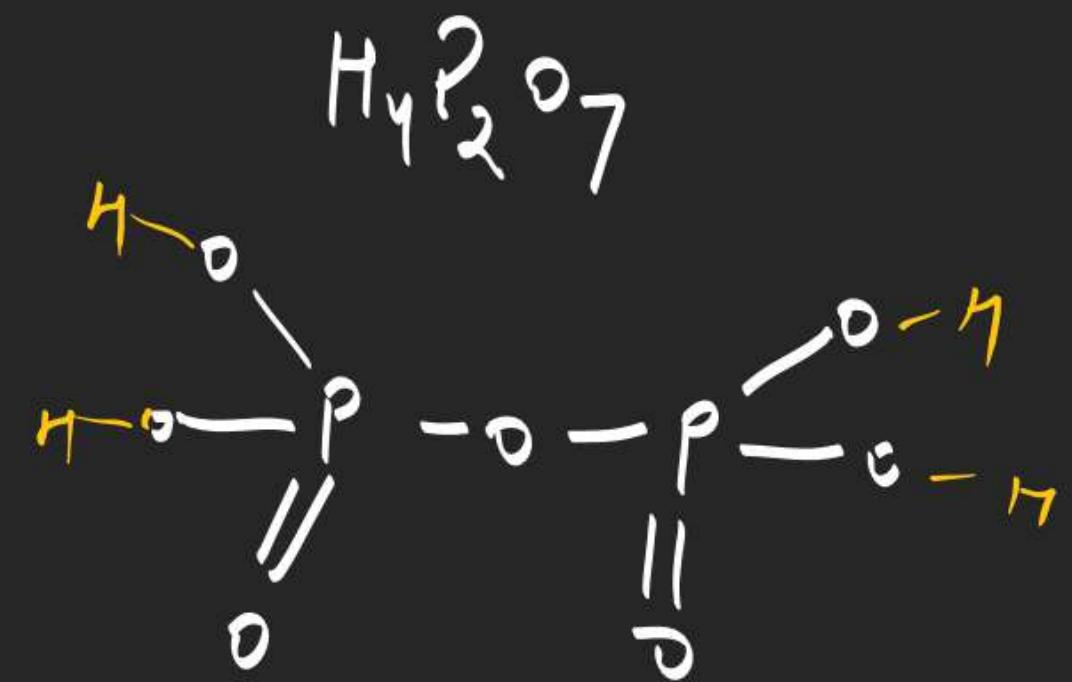
$$y = 6$$

$$z = 1$$

$$11$$

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4. The ratio of sigma and π bonds present in pyrophosphoric acid is



$$\frac{12}{2} = \underline{6}$$

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5. Given below are two statements :

Statement-I : Methane and steam passed over a heated Ni catalyst produces hydrogen gas.



Statement-II : Sodium nitrite reacts with NH₄Cl to give H₂O, N₂ and NaCl.

In the light of the above statements, choose the most appropriate answer from the options given below :



- (A) Statement I is incorrect but Statement II is correct
- (B) Both the statements I and II are incorrect
- (C) Statement I is correct but Statement II is incorrect
- (D) Both the statements I and II are correct

6. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A: A solution of the product obtained by heating a mole of glycine with a mole of chlorine in presence of red phosphorous generates chiral carbon atom.

Reason R: A molecule with 2 chiral carbons is always optically active.

In the light of above statements, chose the correct answer from the options given below:

- (A) A is true but R is false
- (B) Both A and R are true but R is the correct explanation of A
- (C) A is false but R is true
- (D) Both A and R are true but R is NOT the correct explanation of A

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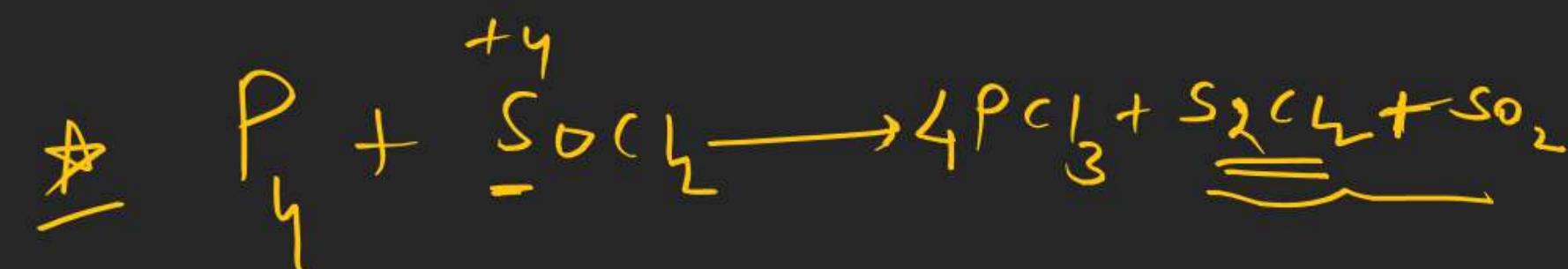
7. ~~* One mole of P_4 reacts with 8 moles of $SOCl_2$ to give 4 moles of A, x mole of SO_2 and 2 moles of B. A, B and x respectively are [2023 (11 Apr Shift 2)]~~

(A) $POCl_3$, S_2Cl_2 and 2

(C) PCl_3 , S_2Cl_2 and 2

~~(B) PCl_3 , S_2Cl_2 and 4~~

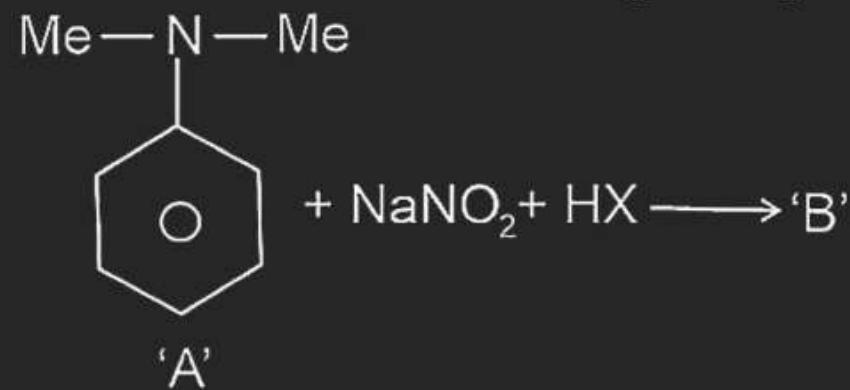
(D) $POCl_3$, S_2Cl_2 and 4



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8. One mole of P_4 reacts with 8 moles of $SOCl_2$ to give 4 moles of A, x mole of SO_2 and 2 moles of B. A, B and x respectively are
- (A) $POCl_3$, S_2Cl_2 and 2 (B) PCl_3 , S_2Cl_2 and 4
(C) PCl_3 , S_2Cl_2 and 2 (D) $POCl_3$, S_2Cl_2 and 4

9. The incorrect statement regarding the reaction given below is

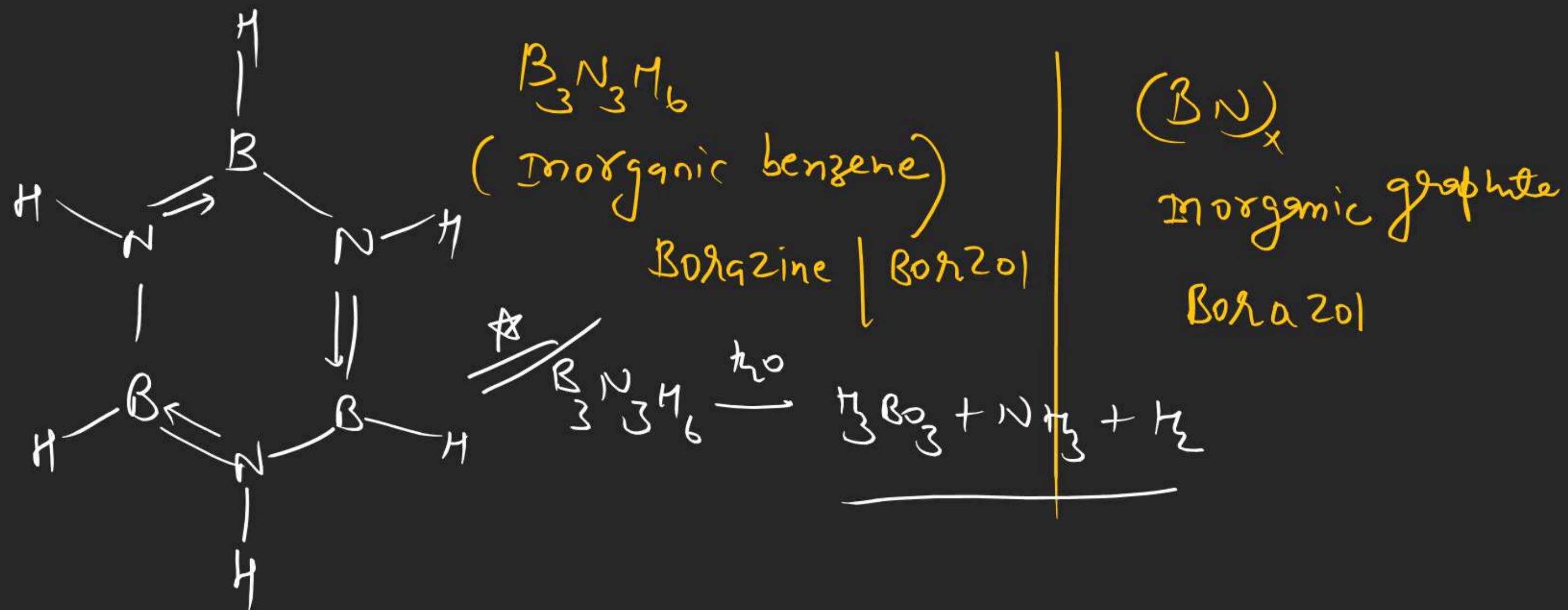


- (A) The product ' B ' formed in the above reaction is p-nitroso compound at low temperature
- (B) ' B ' is N-nitroso ammonium compound
- (C) The reaction occurs at low temperature
- (D) The electrophile involved in the reaction is NO⁺

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10. The incorrect statement from the following for borazine is:

- (A) It contains banana bonds
- (B) It can react with water
- (C) It is a cyclic compound
- (D) It has electronic delocalization



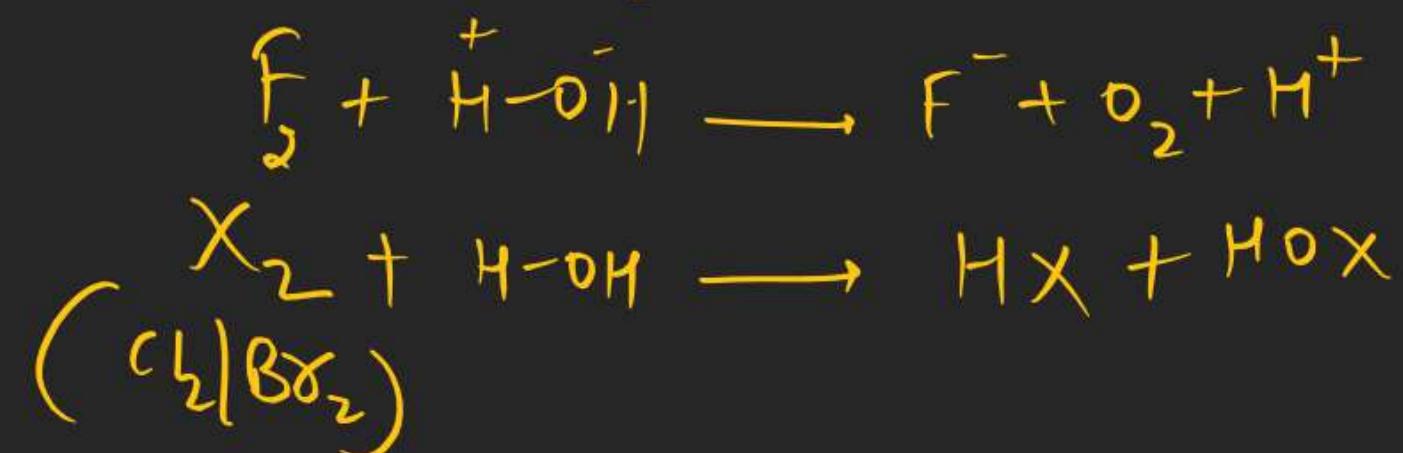
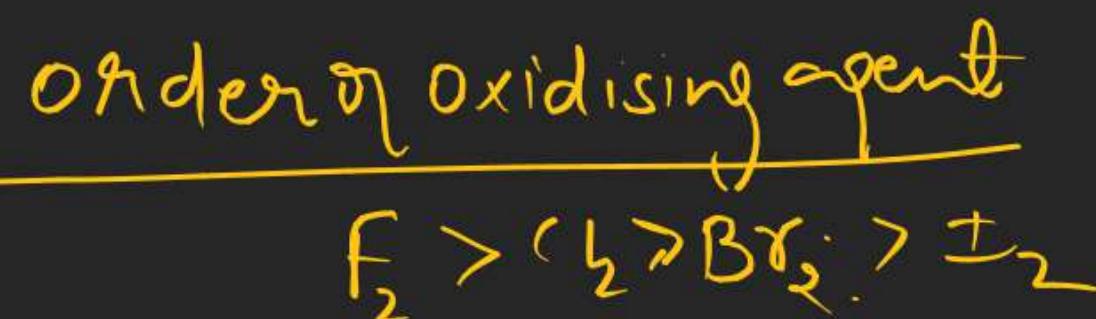
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11.

The correct group of halide ions which can be oxidized by oxygen in acidic medium is

- (A) Br^- and I^- only
 (C) I^- only

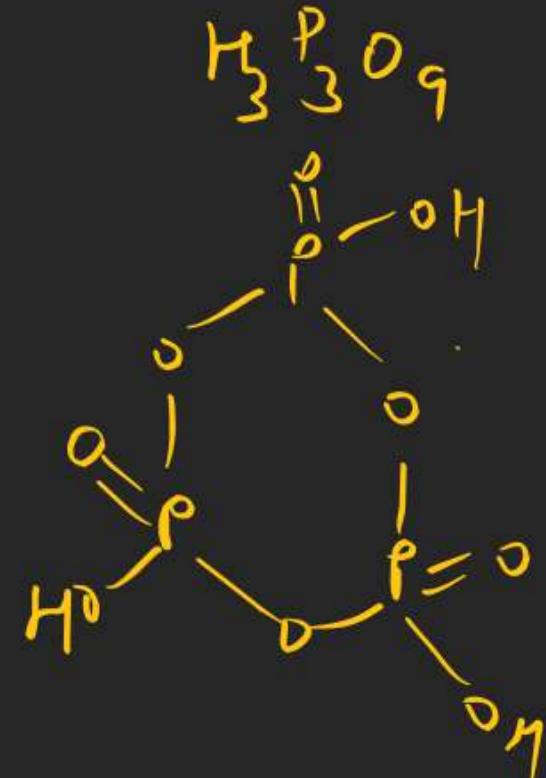
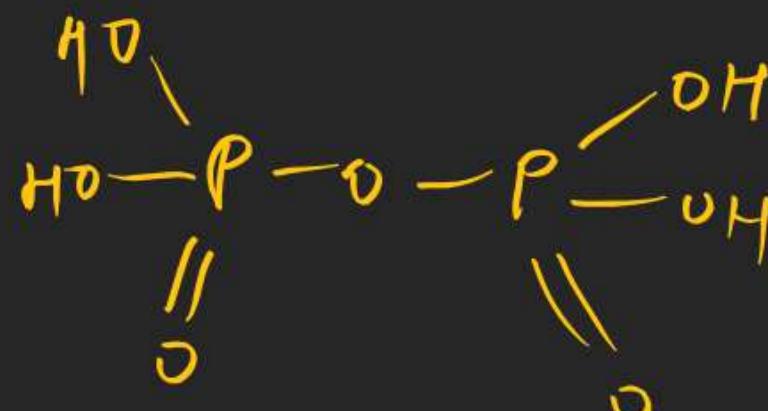
- (B) Br^- only
 (D) Cl^- , Br^- and I^- only



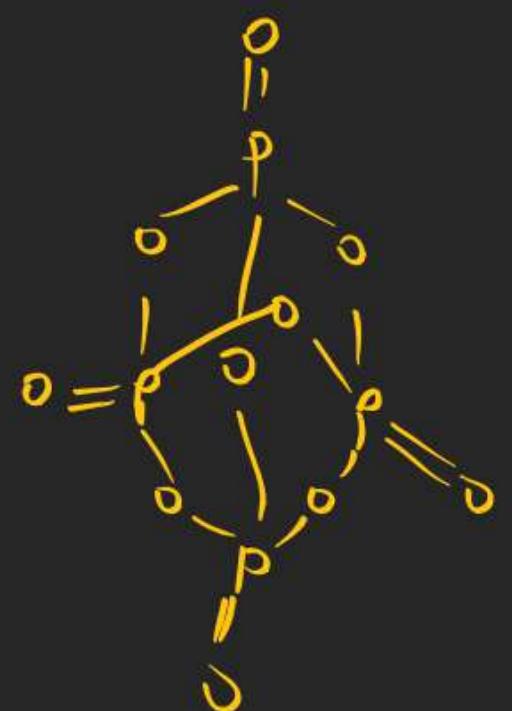
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12. The number of P – O – P bonds in $\text{H}_4\text{P}_2\text{O}_7$, $(\text{HPO}_3)_3$, and P_4O_{10} are respectively

- (A) 0, 3, 6 (B) 0, 3, 4 (C) 1, 2, 4 (D) 1, 3, 6

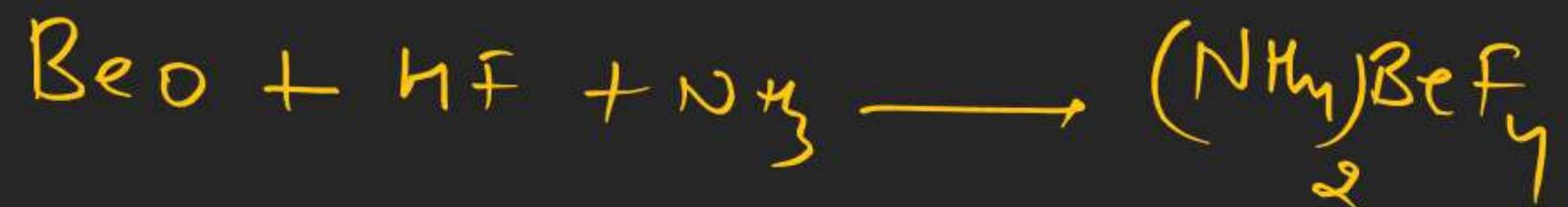


Pyrophosphoric acid



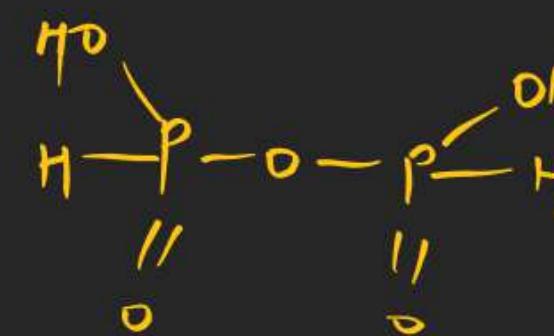
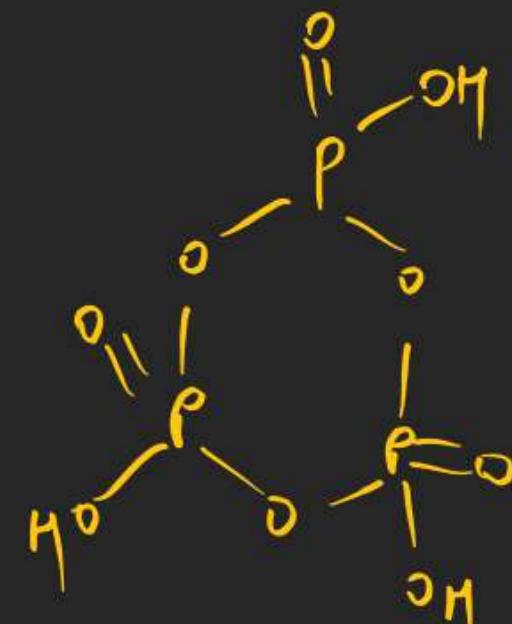
Cyclic trimeta phosphoric acid

13. Reaction of BeO with ammonia and hydrogen fluoride gives 'A' which on thermal decomposition gives BeF₂ and NH₄ F. What is 'A' ?



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14. Which of the Phosphorus oxoacid can create silver mirror from AgNO_3 solution ?



Reducing agent



Pyrophosphorous
acid

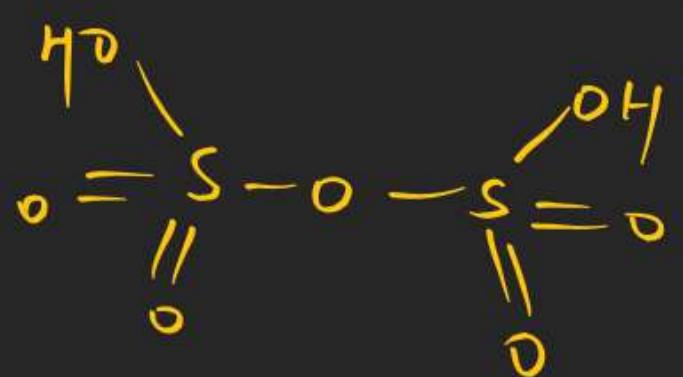


Hypophosphoric acid



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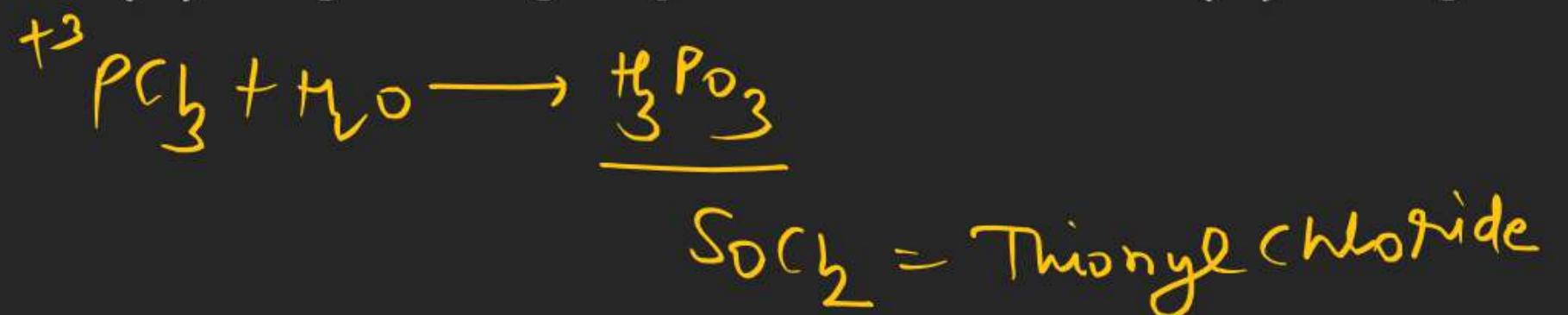
15. Sum of π -bonds present in peroxodisulphuric acid and pyrosulphuric acid is



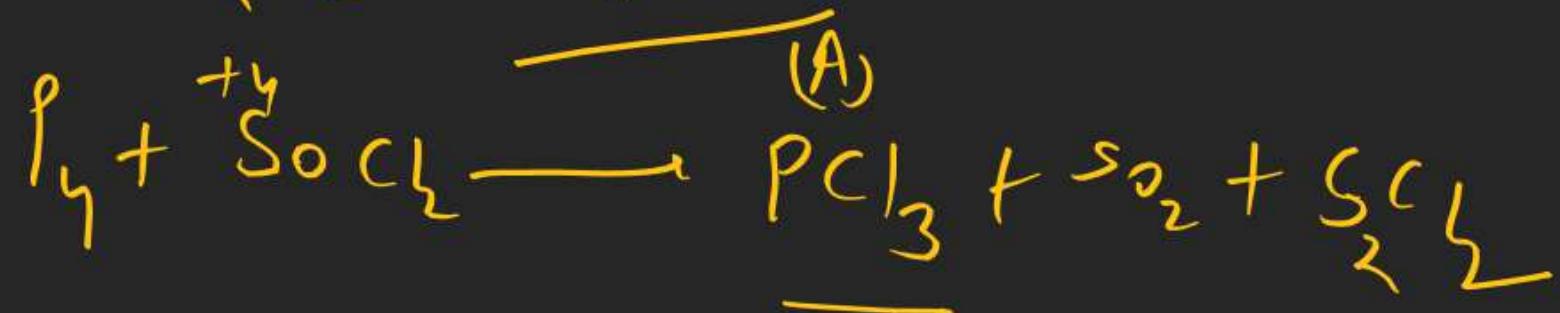
$$4 + 4 = \underline{8}$$

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16. Reaction of **thionyl chloride** with white phosphorus forms a compound [A], which on hydrolysis gives [B], a dibasic acid. [A] and [B] are respectively
- (A) P_4O_6 and H_3PO_3 (B) PCl_3 and H_3PO_3
 (C) PCl_5 and H_3PO_4 (D) $POCl_3$ and H_3PO_4



SO_2Cl_2 = Sulphuric Chloride



17. Some reactions of NO_2 relevant to photochemical smog formation are

Identify A, B, X and



(A) $X = [\text{O}], Y = \text{NO}, A = \text{O}_2, B = \text{O}_3$

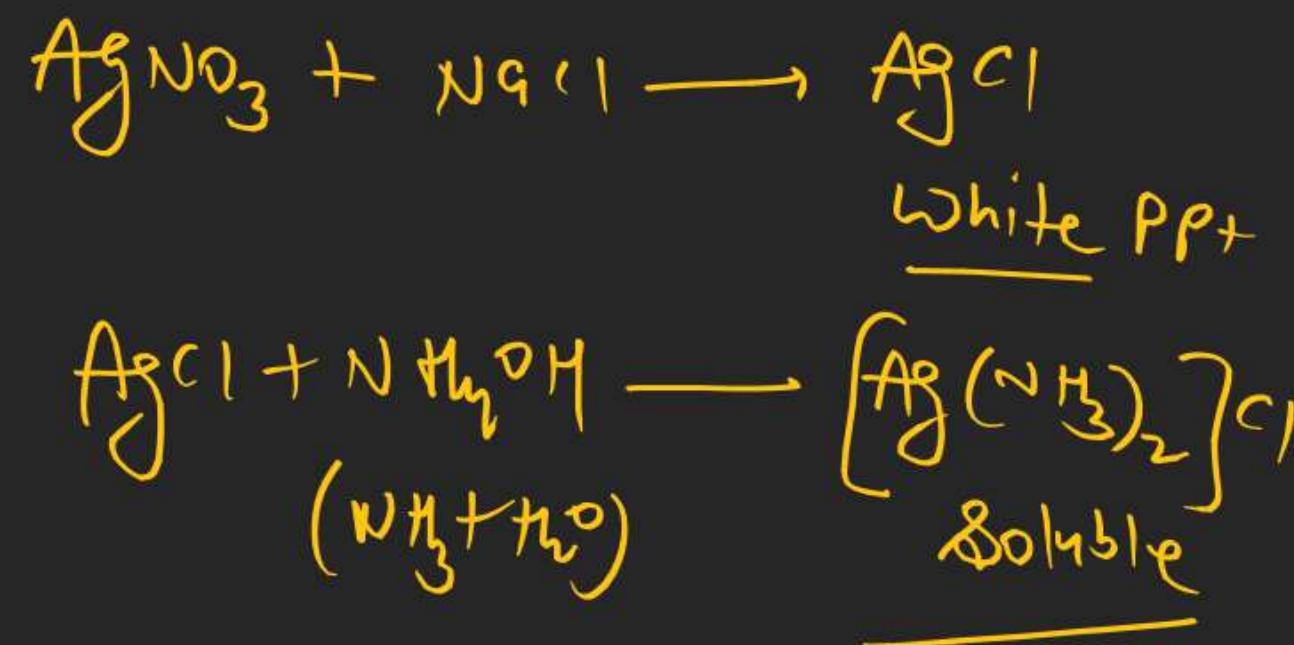
(C) $X = \frac{1}{2}\text{O}_2, Y = \text{NO}_2, A = \text{O}_3, B = \text{O}_2$

(B) $X = \text{N}_2\text{O}, Y = [\text{O}], A = \text{O}_3, B = \text{NO}$

(D) $X = \text{NO}, Y = [\text{O}], A = \text{O}_2, B = \text{N}_2\text{O}_3$

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18. A chloride salt solution acidified with dil. HNO_3 gives a curdy white precipitate, [A], on addition of AgNO_3 . [A] on treatment with NH_4OH gives a clear solution, B.



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- 19.
- a. Ammonium salts produce haze in atmosphere.
 - b. Ozone gets produced when atmospheric oxygen reacts with chlorine radicals.
 - c. Polychlorinated biphenyls act as cleansing solvents.
 - d. 'Blue baby' syndrome occurs due to the presence of excess of sulphate ions in water.

Choose the correct answer from the options given below :-

(A) A, B and C only

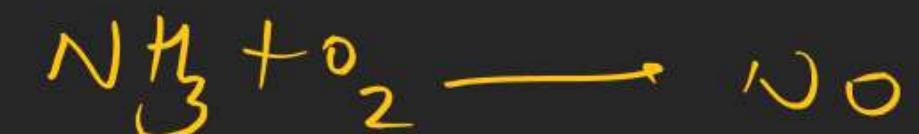
(B) B and C only

(C) A and D only

(D) A and C only

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20. "A" obtained by Ostwald's method involving air oxidation of NH_3 , upon further air oxidation produces "B". "B" on hydration forms an oxoacid of Nitrogen along with evolution of "A". The oxoacid also produces "A" and gives positive brown ring test



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21. The number of molecules or ions from the following, which do not have odd number of electrons are



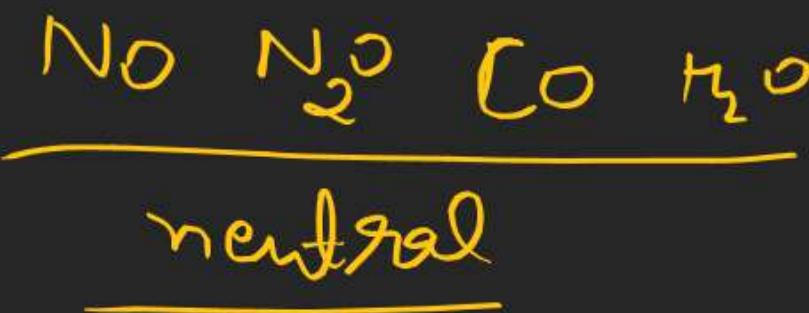
(3)



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22. Total number of **acidic oxides** among N_2O_3 , NO_2 , N_2O , Cl_2O_7 , SO_2 , CO , CaO , Na_2O and NO is

(4)



S-block oxides are

Basic except BeO

Amphoteric

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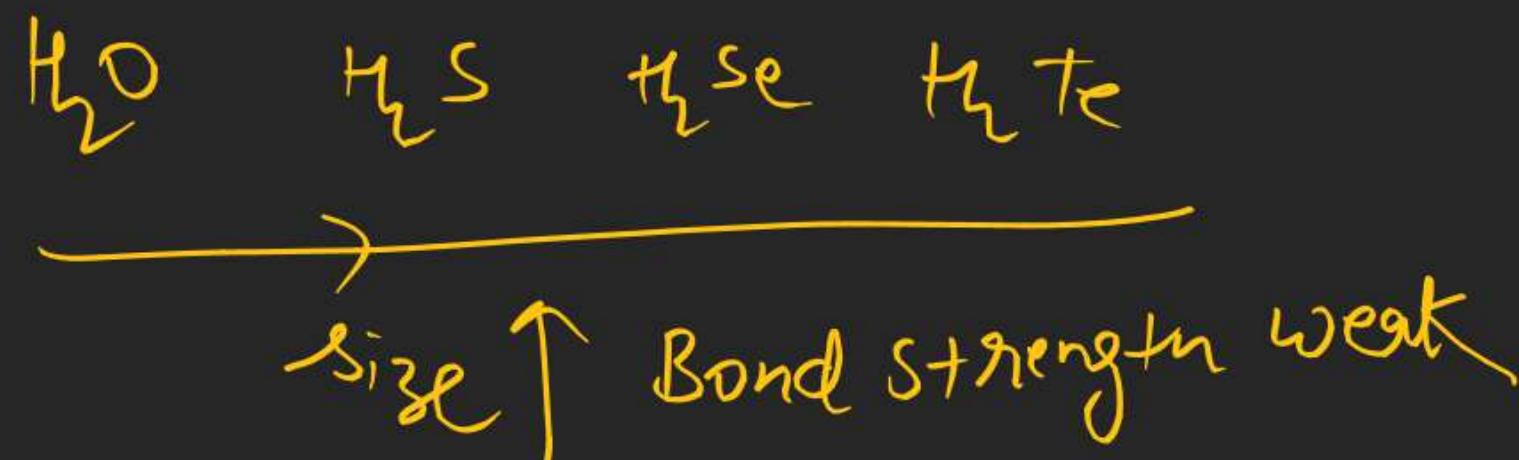
23. Bond dissociation energy of E-H bond of the " H₂E " hydrides of group 16 elements (given below), follows order.

(a) O

(b) S

(c) Se

(d) Te

~~(A) A > B > C > D~~~~(C) B > A > C > D~~~~(B) A > B > D > C~~~~(D) D > C > B > A~~

24. Identify X, Y and Z in the following reaction. (Equation not balanced)



- (A) X = ClONO₂, Y = HOCl, Z = NO₂ (B) X = ClNO₂, Y = HCl, Z = HNO₃
(C) X = ClONO₂, Y = HOCl, Z = HNO₃ (D) X = ClNO₃, Y = Cl₂, Z = NO₂

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25. The oxidation state of phosphorus in hypophosphoric acid is +



(4)



$$4 + 2x + 6(-2) = 0$$

$$x = \underline{+4}$$

26. Given below are two statements:

Statement I: Chlorine can easily combine with oxygen to form oxides: and the product has a tendency to explode.



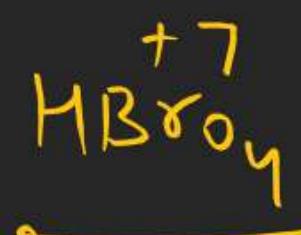
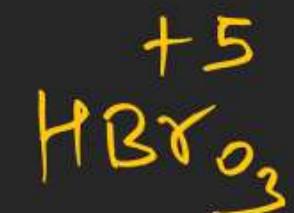
Statement II: Chemical reactivity of an element can be determined by its reaction with oxygen and halogens.

In the light of the above statements, choose the correct answer from the options given below.

- (A) Both the statements I and II are true
- (B) Statement I is true but Statement II is false
- (C) Statement I is false but Statement II is true
- (D) Both the Statements I and II are false

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27. Sum of oxidation states of bromine in bromic acid and perbromic acid is

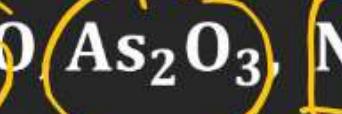


$$\underline{7 + 5 = 12}$$

2022

1.

Given below are the oxides:



Number of amphoteric oxides is:

(A) 0

(B) 1

(C) 2

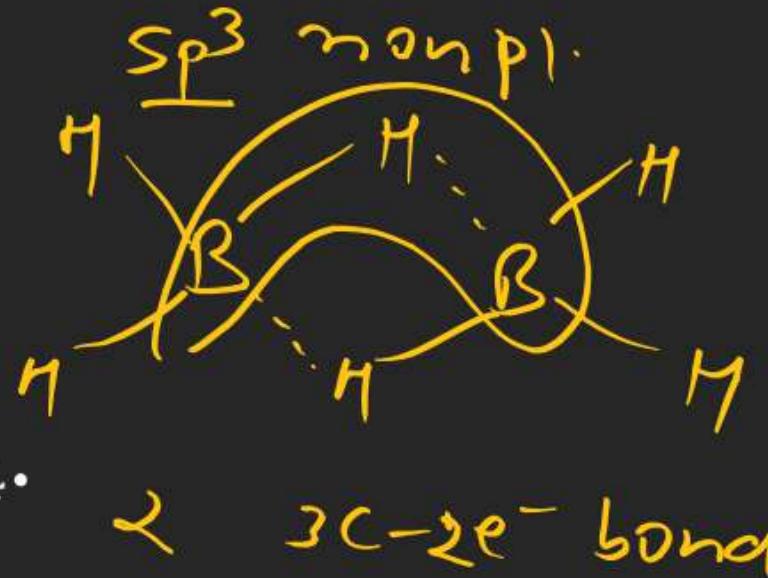
(D) 3

neutral

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2. Identify the correct statement for B_2H_6 from those given below.

- (a) In B_2H_6 , all B-H bonds are equivalent.
- (b) In B_2H_6 there are four 3-centre-2-electron bonds.
- (c) B_2H_6 is a Lewis acid.
- (d) B_2H_6 can be synthesized from both BF_3 and $NaBH_4$.
- (e) B_2H_6 is a planar molecule.



Choose the most appropriate answer from the options given below :

(A) (A) and (E) only

(C) (C) and (D) only

(B) (B), (C) and (E) only

(D) (C) and (E) only

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3. Which one of the following elemental forms is not present in the enamel of the teeth?

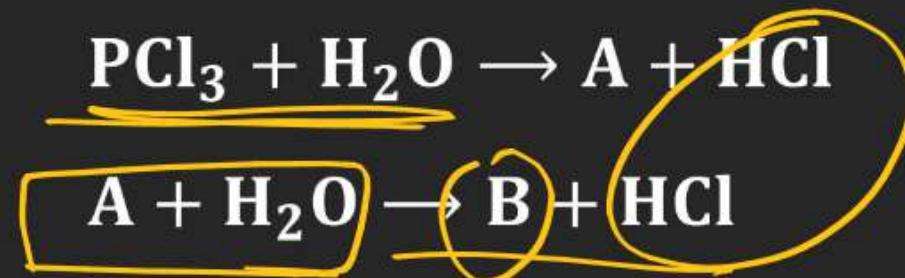


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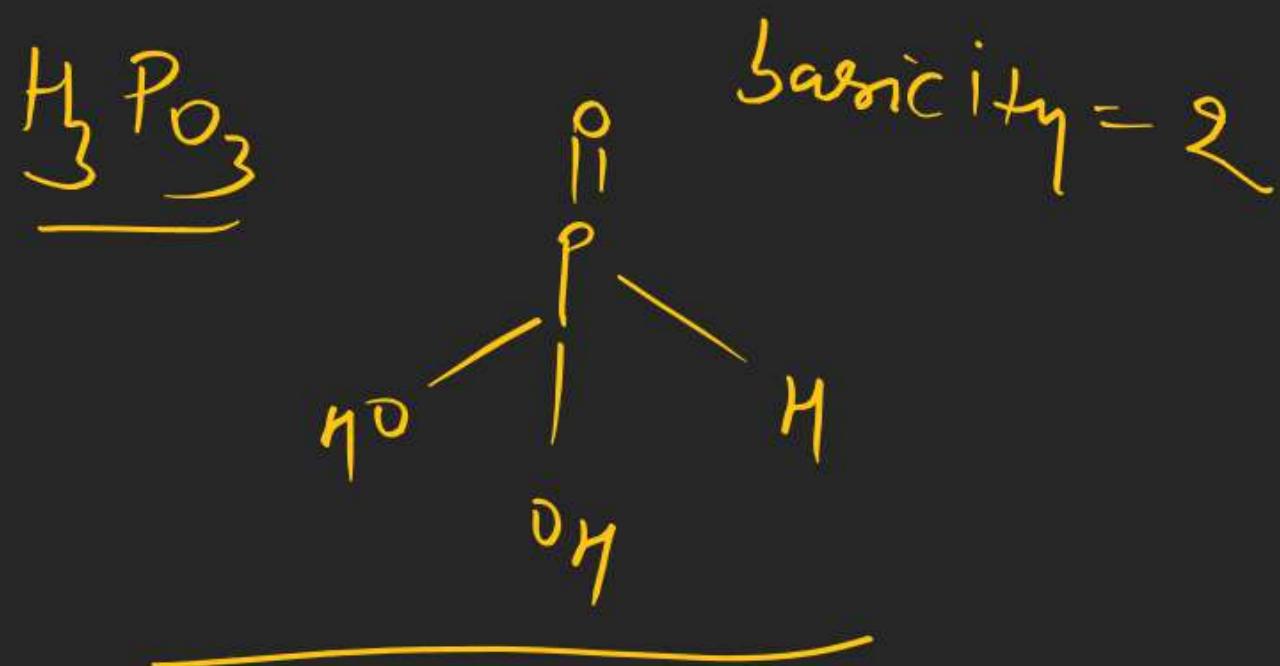
4. PCl_5 is well known. but NCl_5 is not. Because.
- (A) nitrogen is less reactive than phosphorous.
 - ~~(B) nitrogen doesn't have d-orbitals in its valence shell.~~
 - (C) catenation tendency is weaker in nitrogen than phosphorous.
 - (D) size of phosphorous is larger than nitrogen.

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5. Consider the following reactions :

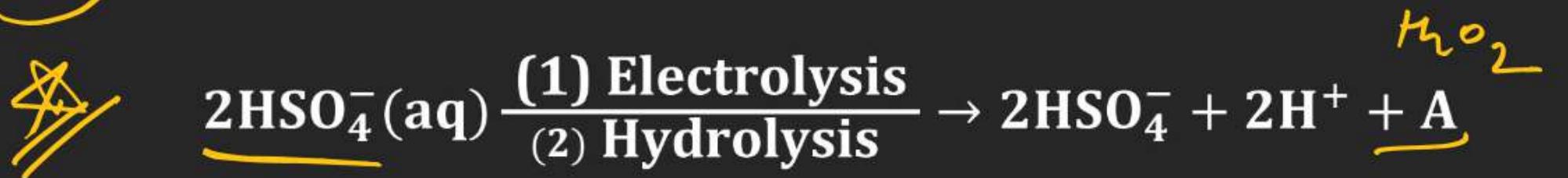


number of ionizable protons present in the product B



6.

Consider the following reaction :



The dihedral angle in product A in its solid phase at 110 K is :

- (A) 104° (B) 111.5° ~~(C) 90.2°~~ (D) 111.0°

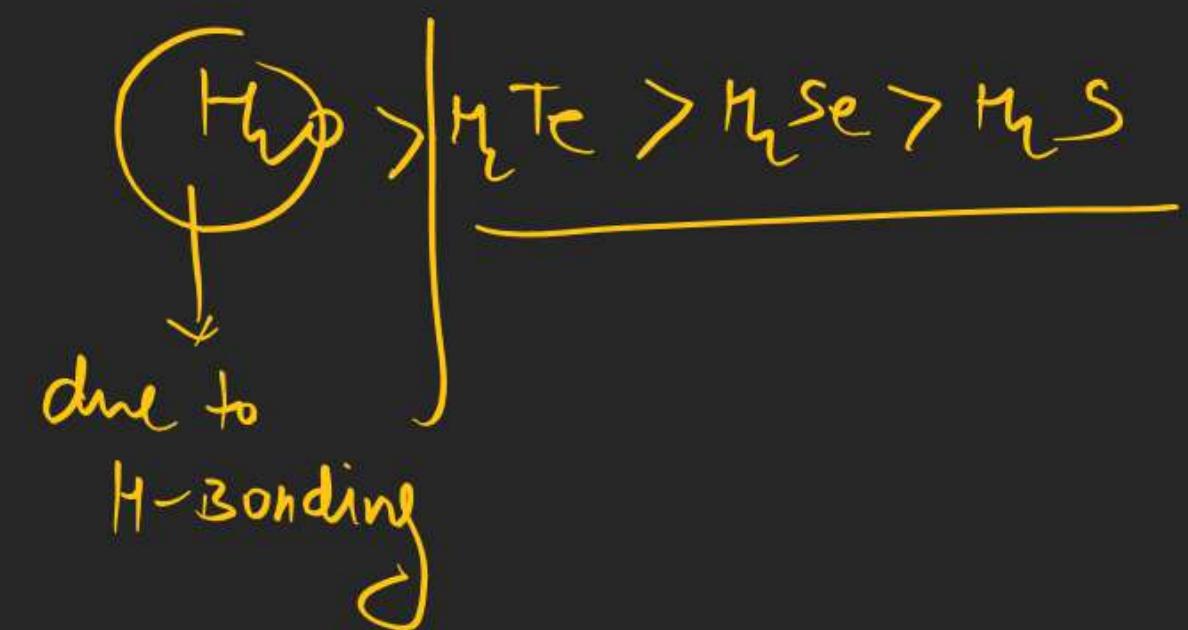
Hydrogen and its compound

H_2O_2

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7. The correct order of **melting points** of hydrides of group 16 elements is :

- ~~(A) $H_2S < H_2Se < H_2Te < H_2O$~~ (B) $H_2O < H_2S < H_2Se < H_2Te$
~~(C) $H_2S < H_2Te < H_2Se < H_2O$~~ (D) $H_2Se < H_2S < H_2Te < H_2O$



8. Consider the following reaction :



A + alkali \rightarrow B (Major Product)

If B is an oxoacid of phosphorus with no P – H bond, then A is :

(A) White P_4

(B) Red P_4

(C) P_2O_3

(D) H_3PO_3