

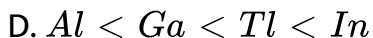
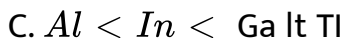
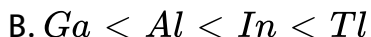
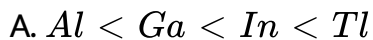
CHEMISTRY

BOOKS - IIT-JEE PREVIOUS YEAR (CHEMISTRY)

P BLOCK ELEMENTS

Jee Main And Advanced

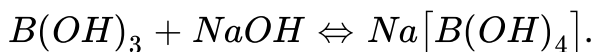
1. The increasing order of atomic radii of the following Group 13 element is



Answer: B

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2. How can the following reaction be made to proceed in forward direction ?



- A. Addition of cis 1,2-diol
- B. Addition of borax
- C. Addition of trans 1,2-diol
- D. Addition of Na_2HPO_4

Answer: A

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3. H_3BO_3 is.

- A. monobasic acid and weak Lewis acid
- B. monobasic and weak Bronsted acid
- C. monobasic and strong Lewis acid
- D. tribasic and weak Bronsted acid

Answer: A



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4. In compounds of type ECl_3 where $E = B, P, As, Bi$. The angles $Cl - E - Cl$ for different E are in the order :

- A. $B > P = As = Bi$
- B. $B > P > As > Bi$
- C. $B < P = As = Bi$

D. $B < P < As < Bi$

Answer: B



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5. Moderate electrical conductivity is shown by

A. silica

B. graphite

C. diamond

D. None of the above

Answer: B



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6. Among the following, the correct statement (s) is (are)

- A. $Al(CH_3)_3$ has the three-centre two-electron bonds in its dimeric structure
- B. The Lewis acidity of BCl_3 is greater than that of $AlCl_3$
- C. $AlCl_3$ has the three-centre two-electron bonds in its dimeric structure
- D. BH_3 has the three-centre two-electron bonds in its dimeric structure

Answer: A::B::C



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7. The crystalline form of borax has

- A. tetranuclear $[B_4O_5(OH)_4]^{2-}$ unit
- B. all boron atoms in the same plane
- C. equal number of sp^2 and sp^3 hybridised boron atoms
- D. one terminal hydroxide per boron atom

Answer: A::C::D

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8. The correct statement (s) for orthoboric acid is/are

- A. It behaves as a weak acid in water due to self ionisation
- B. Acidity of its aqueous solution increases upon addition of ethylene glycol
- C. It has a three-dimensional structure due to hydrogen bonding

D. It is a weak electrolyte in water

Answer: B::D

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9. In the following reaction.



The amine (*s*)*x* is /are.

A. NH_3

B. CH_3NH_2

C. $(CH_3)_2NH$

D. $(CH_3)_3N$

Answer: A::B::C

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10. Boron always forms covalent compound.

The small size of B^{3+} favours formation of covalent compound.

- A. Statement I is correct, Statement II is correct Statement II is the correct explanation of Statement I
- B. Statement I is correct, Statement II is correct Statement II is no the correct explanation of Statement I
- C. Statement I is correct, Statement II is incorrect
- D. Statement I is incorrect, Statement II is correct

Answer: A



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11. Statement I In water, orthoboric acid behaves as a weak monobasic acid.

Statement II In water, orthoboric acid acts as a proton donor.

- A. Statement I is correct, Statement II is correct Statement II is the correct explanation of Statement I
- B. Statement I is correct, Statement II is correct Statement II is no the correct explanation of Statement I
- C. Statement I is correct, Statement II is incorrect
- D. Statement I is incorrect, Statement II is correct

Answer: A



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12. $Al(OH)_3$ is amphoteric in nature.

$Al - O$ and $O - H$ bonds can be broken with equal ease in $Al(OH)_3$.

- A. Statement I is correct, Statement II is correct Statement II is the correct explanation of Statement I
- B. Statement I is correct, Statement II is correct Statement II is not the correct explanation of Statement I
- C. Statement I is correct, Statement II is incorrect
- D. Statement I is incorrect, Statement II is correct

Answer: A



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13. Match the following

Column I	Column II
A. $\text{Bi}^{3+} \rightarrow (\text{BiO})^+$	p. Heat
B. $[\text{AlO}_2]^- \rightarrow \text{Al}(\text{OH})_3$	q. Hydrolysis
C. $\text{SiO}_4^{4-} \rightarrow \text{Si}_2\text{O}_7^{6-}$	r. Acidification
D. $(\text{B}_4\text{O}_7^{2-}) \rightarrow [\text{B}(\text{OH})_3]$	s. Dilution by water

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14. The two types of bonds present in B_2H_6 are covalent and _____.

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15. The basic nature of the hydroxides of group 13 decreases progressively down the group.

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16. All the $Al - Cl$ bonds in Al_2Cl_6 are equivalent.

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17. Three moles of B_2H_6 are completely reacted with methanol.

The number of moles of boron containing product formed is.

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18. The value of n in the molecular formula $Be_nAl_2SiO_{18}$ is

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19. AlF_3 is insoluble in anhydrous HF but when little KF is added to the compound it becomes soluble. On addition of BF_3 , AlF_3 precipitated. Write the balanced chemical equations.



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20. How is boron obtained from borax ? Give the chemical reactions involved. Draw the structure of B_2H_6 and give its reaction with HCl .



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21. Compound (X) on reduction with $LiAlH_4$ gives a hydride (Y) containing 21.72% hydrogen along with other products. The compound (Y) reacts with air explosively resulting in formation of boron trioxide. Identify (X) and (Y).

Give balanced reactions involved in the formation of (Y) and its reaction with air. Give the structure of (Y).



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22. Aluminium sulphide gives a foul odour when it becomes damp.

Write a balanced chemical equation for the reaction.

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23. Anhydrous $AlCl_3$ is covalent. From the data given below, predict whether it would remain covalent or become ionic in aqueous solution. (Ionisation energy for Al is $1537kJmol^{-1}$)

$$\Delta_{\text{hydration}}f \text{ or } Al^{3+} = -4665kJmol^{-1}$$

$$\Delta_{\text{hydration}}f \text{ or } Cl^{\ominus} = -381kJmol^{-1}.$$

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24. The name of the structure of silicates in which three oxygen atoms of $[SiO_4]^{4-}$ are shared is

- A. pyrosilicate
- B. sheet silicate
- C. linear chain silicate
- D. three-dimensional silicate

Answer: A

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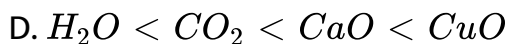
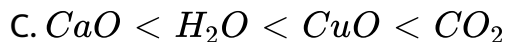
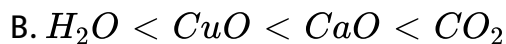
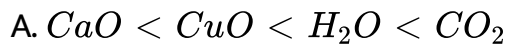
25. Me_2SiCl_2 on hydrolysis will produce

- A. $(Me)_2Si(OH)_2$
- B. $(Me)_2Si = O$
- C. $[- O - (Me)_2Si - O -]_n$
- D. $Me_2SiCl(OH)$

Answer: C

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26. Identify the correct order of acidic strength of CO_2 , CuO , CaO and H_2O .



Answer: A

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27. which one of the following oxides is neutral?

A. CO

B. SnO_2

C. ZnO

D. SiO_2

Answer: A



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28. Which halide is stable and has doubtful existence?

A. CCl_4

B. GeI_4

C. SnI_4

D. PbI_4

Answer: D

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29. With respect to graphite and diamond, which of the statements given below are correct?

- (1) Graphite is harder than diamond.
- (2) Graphite has higher electrical conductivity than diamond.
- (3) Graphite has higher thermal conductivity than diamond.
- (4) Graphite has higher $C - C$ bond order than diamond.

- A. Graphite is harder than diamond
- B. Graphite has higher electrical conductivity than diamond.
- C. Graphite has higher thermal conductivity than diamond.
- D. Graphite has higher $C - C$ bond order than diamond

Answer: B::D

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30. Assertion (A) : Pb^{+4} compounds are stronger oxidising agents than Sn^{4+} compounds .

Reason (R): The higher oxidation states for group 14 elements are more stable for the heavier members of the group due to inert pair effect .

- A. Statement I is correct, Statement II is correct Statement II is the correct explanation of Statement I
- B. Statement I is correct, Statement II is correct Statement II is no the correct explanation of Statement I
- C. Statement I is correct, Statement II is incorrect
- D. Statement I is incorrect, Statement II is correct

Answer: A

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31. Between $SiCl_4$ and CCl_4 , only $SiCl_4$ reacts with water.

$SiCl_4$ is ionic and CCl_4 is covalent.

- A. Statement I is correct, Statement II is correct Statement II is the correct explanation of Statement I
- B. Statement I is correct, Statement II is correct Statement II is no the correct explanation of Statement I
- C. Statement I is correct, Statement II is incorrect
- D. Statement I is incorrect, Statement II is correct

Answer: C

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32. A liquid which is permanently supercooled is frequently called a

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33. One recently discovered allotrope of carbon (*e. g.* C_{60}) is commonly known as

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34. On controlled hydrolysis and condensation, R_3SiCl yields

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35. The hydrolysis of alkyl-substituted chlorosilanes gives



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36. The tendency for catenation is much higher for C than for *Si*.



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37. Diamond is harder than graphite.



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38. Graphite is a better lubricant on the moon than on the earth .



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39. Carbon tetrachloride burns in air when lighted to give phosgene.

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40. Starting from $SiCl_4$ prepare the following in steps not exceeding the number given in parentheses (give reaction only)

a. Silicon (1)

b. Linear silicon containing methyl groups only (4)

c. Na_2SiO_3 (3).

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41. Draw the structure of a cyclic silicate, $(Si_3O_9)^{6-}$ with proper labelling.

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42. Write the balanced equation for the preparation of crystalline silicon from $SiCl_4$.

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43. Each entry in column X is in some way related to the entries in column Y and Z. Match the appropriate entries.

columns Y and Z. Match the appropriate entries.

X	Y	Z
Yeast	Fermentation	Ethanol
Mica	Graphite	Abrasive
Superphosphate	Crystalline cubic	Insulator
Carbon fibres	Layer structure	Fertiliser
Rock salt	Diamond structure	Reinforced plastics
Carborundum	Bone ash	Preservative

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44. Give reasons for the following in one or two sentences :

"Graphite is used as a solid lubricant."

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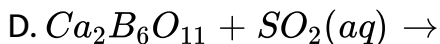
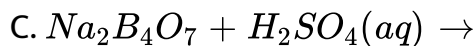
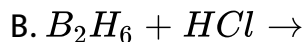
45. Give reason for the following in one or two sentences : "Solid carbon dioxide is known as dry ice."

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46. Carbon acts as an abrasive and also as a lubricant, explain.

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47. All of the following gives orthoboric acid except



Answer: B



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48. Which is incorrect statement regarding B_2H_6 ?

A. It is a strong reducing agent

B. On heating, gives amorphous boron

C. It is a planar molecule

D. With excess $(CH_3)_3N$, undergo symmetrical cleavage

Answer: C

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49. Which is not true regarding silicones?

- A. $(CH_3)_2SiCl_2$ on hydrolysis in excess of water gives a linear chain silicone
- B. $(CH_3)_2SiCl_2$ on hydrolysis in limited supply of water gives mainly six membered cyclic silicone
- C. $(CH_3)_2SiCl$ is added during synthesis of silicone to control the molar mass
- D. Silicones are all solid plastic at room temperature

Answer: D

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50. Select the incorrect statement.

A. In $Si_2O_7^{6-}$, there is one shared oxygen

B. $Si_6O_{18}^{12-}$ represents a cyclic silicate with two shared oxygen per silicon atom

C. Pyroxene is a linear chain silicate with two shared oxygen per silicon atom

D. In three-dimensional network silicate, there are three shared oxygen per silicon atom.

Answer: D



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51. Carbon monoxide is prepared by

- A. heating formic acid with conc. H_2SO_4
- B. heating potassium ferrocyanide with conc. H_2SO_4
- C. heating malonic acid with P_4O_{10}
- D. hydrolysis of Mg_2C_3

Answer: A::B

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52. Which is/are correct ?

- A. Al acts as a reducing agent
- B. Al does not react with steam even at higher temperature
- C. Al forms a number of alloys with other metals

D. Al is ionic in all its compounds

Answer: A::B::C

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53. About 95% of the earth's crust is composed of silicate minerals, aluminosilicate clay and silica. Silicates are classified on the basis of bonding and the metal ions present in them. Some of the common categories of silicates are

(I) orthosilicates , (II) pyrosilicates

(III) cyclic silicates , (IV) chain silicates

(V) amphiboles , (VI) sheet silicates

(VII) three-dimensional network silicates

Which of the following is not true regarding cyclic silicates ?

A. Its general formula $(SiO_3)_n^{2n-}$

B. It has two shared oxygen per tetrahedron

C. Both $Ca_3[Si_3O_9]$ and $Be_3Al_2[Si_6O_{18}]$ are cyclic silicates

D. Pyroxene is a chain silicate but do not contain cyclic structure

Answer: D

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54. About 95% of the earth's crust is composed of silicate minerals, alumino silicate clay or silica. Silicates are classified on the basis of bonding and the metal ions present in them. Some of the common categories of silicates are

(I) orthosilicates , (II) pyrosilicates

(III) cyclic silicates , (IV) chain silicates

(V) amphiboles , (VI) sheet silicates

(VII) three-dimensional network silicates

What is true regarding a double chain silicate 'Amphiboles' ?

- A. It has two shared oxygen per tetrahedron
- B. Its empirical formula is $(SiO_3)_n^{6n-}$
- C. It is formed by joining two single chain silicates through free O^- .
- D. All the four oxygen of the tetrahedraon are shared.

Answer: B

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55. About 95% of the earth's crust is composed of silicate minerals, alumino silicate clay r silica. Silicates are classified on the basis of bonding and the metal ions present in them. Some of the common categories of silicates are

(I) orthosilicates , (II) pyrosilicates

(III) cyclic silicates , (IV) chain silicates

(V) amphiboles , (VI) sheet silicates

(VII) three-dimensional network silicates

Which is incorrect regarding three dimensional network silicates ?

A. It is pure SiO_2

B. It has all four oxygen of tetrahedron shared

C. Feldspars, zeolites and ultramarines are the common examples

D. It contains some isomorphously substituted Al^{3+} ion

Answer: A



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56. Assertion: Al forms $[AlF_6]^{3-}$ but B does not form $[BF_6]^{3-}$

Reason: BF_3 on hydrolysis gives HF .

- A. Both assertion and reason are correct and reason is the correct explanation of the assertion.
- B. Both assertion and reason are correct but reason is not the correct explanation of assertion.
- C. Assertion is correct but reason is incorrect
- D. Assertion is incorrect but reason is correct.

Answer: B



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57. Assertion Hydrolysis of $(CH_3)_2SiCl_2$ results in linear chain silicates.

Reason Adding of some $(CH_3)_3SiCl_2$ control the molecular weight of silicones.

- A. Both assertion and reason are correct and reason is the correct explanation of the assertion.
- B. Both assertion and reason are correct but reason is not the correct explanation of assertion.
- C. Assertion is correct but reason is incorrect
- D. Assertion is incorrect but reason is correct.

Answer: B



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58. Match the quantity of Column I with the quantity of Column II.

Column I	Column II
A. Colemanite	p. Na_3AlF_6
B. Cryolite	q. $\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$
C. Bauxite	r. $\text{Ca}_2\text{B}_6\text{O}_{11} \cdot 5\text{H}_2\text{O}$
D. Potash alum	s. $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
E. Borax	t. $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$

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59. In borax ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$) how many $B - O - B$ bonds are present?

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60. Give the basicity of orthoboric acid.

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Test

1. Select correct statement (s).

A. Borax is used as a buffer

B. 1M borax solution reacts with equal volumes of $2mHCl$ solution

C. Titration of borax can be made using methyl orange as the indicator

D. Coloured bead obtained in borax-bead test contains metaborate

Answer: A::B::C::D



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2. Catalytic oxidation of NH_3 (passing a mixture of NH_3 and air over heated Pt gauge) gives.

A. NO

B. N_2O

C. N_2O_3

D. N_2O_5

Answer: a



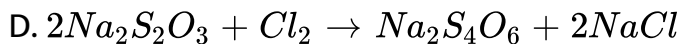
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3. Which is a wrong statement ?

A. Rhombic sulphur disproportionate in aqueous alkali

B. In $Na_2S_2O_3$, the two sulphur are in different oxidation states

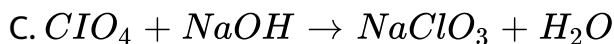
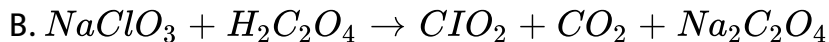
C. Passing H_2S gas through aqueous Na_2SO_3 gives $Na_2S_2O_3$



Answer: d

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4. Which of the following reactions/product is wrongly matched ?



Answer: c

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5. The solubility of iodine in water is increased by

- A. boiling the solution
- B. adding $NaNO_3$
- C. adding HI acid
- D. addition of potassium iodide

Answer: d

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6. XeF_4 reacts with SF_4 to give

A. $XeOF_4$ and SO_2

B. Xe and SF_6

C. XeF_2 and SF_6

D. SF_6 and XeO_3

Answer: b

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7. Which of the following statement is/are true for XeF_6 ?

A. Its partial hydrolysis gives $XeOF_4$

B. Its reaction with silica gives $XeOF_4$

C. It is prepared by the reaction of XeF_4 and O_2F_2

D. Its reaction with XeO_3 gives $XeOF_4$

Answer: a,b,c,d

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8. Phosphine is obtained by the reaction when

- A. white phosphorus is heated with NaOH
- B. Ca_3P_2 reacts with water
- C. red phosphorus is heated with NaOH
- D. phosphorus is heated in a current of hydrogen

Answer: a,b

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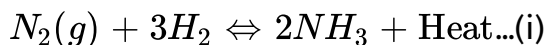
9. Which of the following statement is /are true for sodium thiosulphate ?

- A. It acts as an antichlor
- B. It is used as an reducing agent in iodometric titration
- C. It reacts with hydrochloric acid to form SO_2 and sulphur
- D. It is used in photography as hypo to dissolve excess of AgBr
as soluble complex

Answer: a,b,c,d

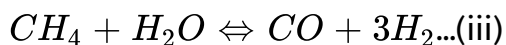
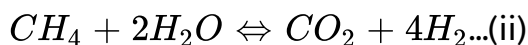
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10. Ammonia is produced on large scale by Haber-Bosch process which involve the following reaction



The condition used are 200 atmosphere pressure, $450^{\circ}C$ and a catalyst "Promoted Iron".

Originally H_2 required for the reaction was produced by electrolysis of water. This was expensive a cheaper method using coke and steam was then used. Now a days, the $H_2(g)$ is produced from hydrocarbons



Some air is added the O_2 burns with some H_2 leaving behind $N_2(g)$ to give the required ratio of $N_2 : H_2 = 1 : 3$

Answer the following questions based on the above information.

Although the reaction is exothermic, it is being carried out at higher temperature because

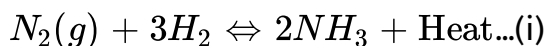
- A. it remove the volatile impurities.
- B. activate the catalyst
- C. maintain a desirable rate of reaction.

D. to have the less proportion of CO.

Answer: c

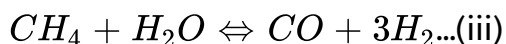
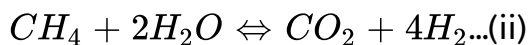
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Answer the following questions based on the above information.

CO produced in the reaction (iii) must be removed continuously during the reaction because.

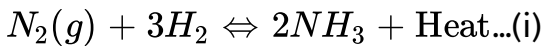
- A. it reacts with product ammonia
- B. it poison the catalyst
- C. it removes with H_2
- D. it removes with N_2

Answer: b



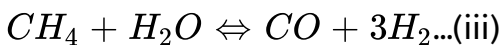
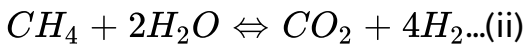
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The condition used are 200 atmosphere pressure, $450^\circ C$ and a catalyst "Promoted Iron".

Originally H_2 required for the reaction was produced by electrolysis of water. This was expensive a cheaper method using coke and steam was then used. Now a days, the $H_2(g)$ is produced from hydrocarbons

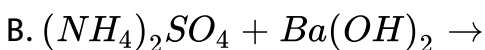


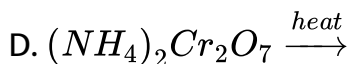
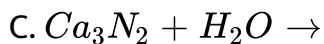
Some air is added the O_2 burns with some H_2 leaving behind $N_2(g)$ to give the required ratio of $N_2 : H_2 = 1 : 3$

Answer the following questions based on the above information.

Besides the above process, there are several other methods of preparation of ammonia. All of the following produce ammonia except.

A. Hydrolysis of $CaNCN$





Answer: d

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13. Statement-1 : Both H_3PO_3 and H_3PO_4 have the same number of hydrogen atoms but H_3PO_4 is a tribasic acid and H_3PO_3 is a dibasic acid.

Statement-2 : 1 mol of H_3PO_3 is neutralised by 2 mol of $NaOH$ while 1 mol of H_3PO_4 is neutralised by 3 mol of $NaOH$

A. Both asseration and reason are correct but reason is not the correct explanation.

B. Both assertion and reason are correct but reason is not the correct explanation.

C. Assertion is correct but reason is wrong.

D. Assertion is wrong but reason is correct.

Answer: b

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14. Assertion: A pink coloured solution of potassium permanganate turns green on passing O_3 through it

Reason K_2MnO_4 is oxidised by O_3 to $KMnO_4$.

A. Both assertion and reason are correct but reason is not the correct explanation.

B. Both assertion and reason are correct but reason is not the correct explanation.

C. Assertion is correct but reason is wrong.

D. Assertion is wrong but reason is correct.

Answer: d

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15. In S_3O_9 how many $\pi(\pi)$ bonds are present?

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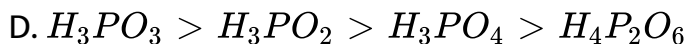
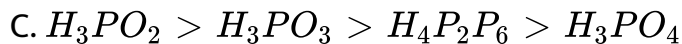
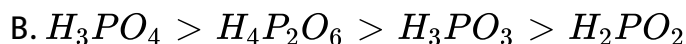
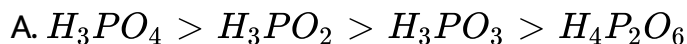
16. In N_2O_5 , how many oxygen atoms are using all its 2p-orbitals in hybridisation?

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Objective Questions I

1. The order of the oxidation state of the phosphorus atom in

H_3PO_2 , H_3PO_4 , H_3PO_3 and $H_4P_2O_6$ is



Answer: B



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2. The species in which the N-atom is in a state of sp hybridisation is



Answer: D



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3. The pair in which phosphorus atoms have a formal oxidation state of +3 is

A. phosphorous and hypophosphoric acids

B. orthophosphorous and hypophosphoric acids

C. pyrophosphorous and pyrophosphoric acids

D. orthophosphorous and pyrophosphorous acids

Answer: B



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4. The product formed in the reaction of $SOCl_2$ (thionyl chloride) with white phosphorous is.

A. PCl_3

B. SO_2Cl_2

C. SCl_2

D. $POCl_3$

Answer: A

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5. Which of the following properties is not shown by NO ?

- A. It is paramagnetic in liquid state
- B. It is a neutral oxide
- C. It combines with oxygen to form nitrogen dioxide
- D. Its bond order is 2.5

Answer: A

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6. Concentrated HNO_3 , upon long standing, turns yellow-brown due to the formation of

A. NO

B. NO_2

C. N_2O

D. N_2O_4

Answer: B



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7. Which of the following is the wrong statement ?

A. $ONCI$ and ONO^- are not isoelectronic

B. O_3 molecule is bent

C. Ozone is violet-black in solid state

D. Ozone is diamagnetic gas

Answer: C

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8. The reaction of white phosphorus with aqueous $NaOH$ gives phosphine along with another phosphorus containing compound.

The reaction type, the oxidation states of phosphorus in phosphine and the other product are respectively:

A. redox reaction, -3 and -5

B. redox reaction, 3 and $+5$

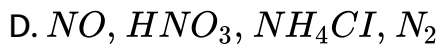
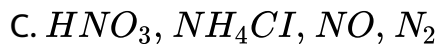
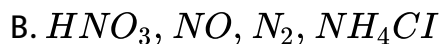
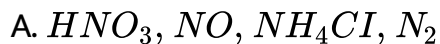
C. disproportionation reaction, -3 and $+5$

D. disproportionation reaction, -3 and $+3$

Answer: C

 [Watch Video Solution](#)

9. Which ordering of compounds is according to the decreasing order of the oxidation state of nitrogen ?



Answer: B

 [Watch Video Solution](#)

10. Extra pure N_2 can be obtained by heating

A. NH_3 with CuO

B. NH_4NO_3

C. $(NH_4)_2Cr_2O_7$

D. $Ba(N_3)_2$

Answer: D



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11. The reaction of P with X leads selectively to P_4O_6 . X is

A. dry O_2

B. a mixture of O_2 and N_2

C. moist O_2

D. O_2 in the presence of aqueous $NaOH$

Answer: B



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12. The percentage of p-character in the orbitals forming $p - p$ bonds in P_4 is

A. 25

B. 33

C. 50

D. 75

Answer: D



[Watch Video Solution](#)

13. Which of the following will not be oxidised by O_3 ?

A. KI

B. $FeSO_4$

C. $KMnO_4$

D. K_2MnO_4

Answer: C



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14. Which gas is evolved when PbO_2 is treated with conc HNO_3 ?

A. NO_2

B. O_2

C. N_2

D. N_2O

Answer: B

 [Watch Video Solution](#)

15. Blue liquid which is formed at $-30^\circ C$ by mixing of two gases is.

A. N_2O

B. N_2O_3

C. N_2O_4

D. N_2O_5

Answer: B

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16. Thermodynamically most stable allotrope of phosphorus is :

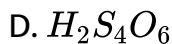
- A. Red
- B. White
- C. Black
- D. Yellow

Answer: C

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17. Which of the following oxoacids of sulphur has -O-O- linkage ?

- A. $H_2S_2O_6$
- B. $H_2S_2O_8$
- C. $H_2S_2O_3$



Answer: B

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18. For H_3PO_3 and H_3PO_4 the correct choice is

A. H_3PO_3 is dibasic and reducing

B. H_3PO_3 is dibasic and non-reducing

C. H_3PO_4 is tribasic and reducing

D. H_3PO_3 is tribasic and non-reducing

Answer: A

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19. Polyphosphates are used for softening agents because they

- A. form soluble complexes with anionic species
- B. precipitate anionic species
- C. form soluble complexes with cationic species
- D. precipitate cationic species

Answer: C

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20. The number of S-S bonds, in sulphur trioxide trimer (S_3O_9) is :

- A. three
- B. two
- C. one

D. zero

Answer: D

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21. Ammonia can be dried by :

A. conc. H_2SO_4

B. P_4O_{10}

C. CaO

D. anhydrous $CaCl_2$

Answer: C

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22. Amongst H_2O , H_2S , H_2Se and H_2Te the one with highest boiling point is :

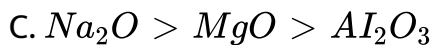
- A. H_2O because of hydrogen bonding
- B. H_2Te because of higher molecular weight
- C. H_2S because of hydrogen bonding
- D. H_2Se because of lower molecular weight

Answer: A

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23. The correct order of acidic strength is

- A. $Cl_2O_7 > SO_2 > P_4O_{10}$
- B. $CO_2 > N_2O_5 > SO_3$



Answer: A

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24. The number of $P - O - P$ bonds in cyclic metaphosphoric acid is.

A. zero

B. two

C. three

D. four

Answer: C

 [Watch Video Solution](#)

25. One mole of calcium phosphide on reaction with excess water gives

- A. one mole of phosphine
- B. two moles of phosphoric acid
- C. two moles of phosphine
- D. one mole of phosphorus pentaoxide

Answer: C

 [Watch Video Solution](#)

26. Sodium thiosulphate is prepared by

- A. reducing Na_2SO_4 solution with H_2S

B. boiling Na_2SO_3 solution with S in alkaline medium

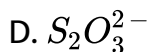
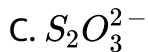
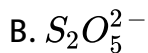
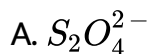
C. neutralising $H_2S_2O_3$ solution with $NaOH$

D. boiling Na_2SO_3 solution with S in acidic medium

Answer: B

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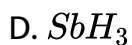
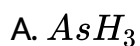
27. There is no $S - S$ bond in



Answer: D

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28. Which one of the following is the strongest base ?



Answer: B

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29. Among the trihalides of nitrogen, which is the least basic ?

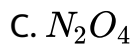
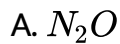




Answer: A

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30. Which of the following oxides of nitrogen is a coloured gas ?



Answer: D

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31. The bonds present in N_2O_5 are .

- A. only ionic
- B. covalent and coordinate
- C. only covalent
- D. covalent and ionic

Answer: B

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32. A gas that cannot be collected over water is.

- A. N_2
- B. O_2
- C. SO_2

D. PH_3

Answer: C

 [Watch Video Solution](#)

33. Ammonia gas can be dried by

A. conc H_2SO_4

B. P_2O_5

C. $CaCl_2$

D. quicklime

Answer: D

 [Watch Video Solution](#)

34. Which of the following is incorrect statement ?

- A. NO is heavier than O_2
- B. The formula of heavy water is D_2O
- C. N_2 diffuses faster than oxygen through an orifice
- D. NH_3 can be used as a refrigerant

Answer: A

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35. When chlorine reacts with cold and dilute solution of sodium hydroxide, the products obtained are

- A. ClO^- and ClO_3^-
- B. ClO_2^- and ClO_3^-

C. Cl^- and ClO^-

D. Cl^- and ClO_2^-

Answer: C

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36. Which among the following is the most reactive gas

A. Cl_2

B. Br_2

C. I_2

D. ICl

Answer: D

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37. Which one has highest boiling point ?

A. *He*

B. *Ne*

C. *Kr*

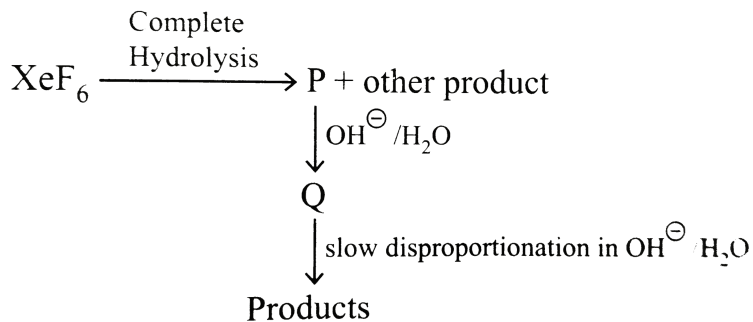
D. *Xe*

Answer: D



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38. Under ambient condition , the total number of gases released products in the final step of the reaction scheme shown below is



A. 0

B. 1

C. 2

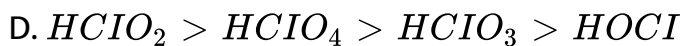
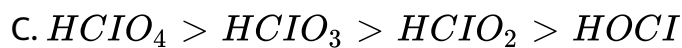
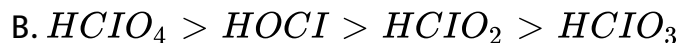
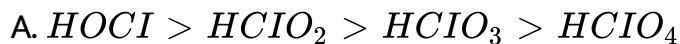
D. 3

Answer: C



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39. Among the following oxoacids, the correct decreasing order of acid strength is



Answer: C

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40. The shapes of XeO_2F_2 molecule is

A. trigonal bipyramidal

B. square planar

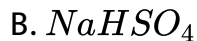
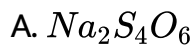
C. tetrahedral

D. see-saw

Answer: A

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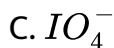
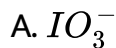
41. Aqueous solution of $Na_2S_2O_3$ on reaction with Cl_2 , gives



Answer: B

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42. When I^{\ominus} is oxidised by MnO_4^{\ominus} in an alkaline medium, I^{\ominus} converts into

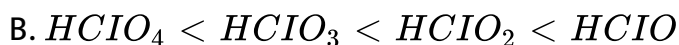
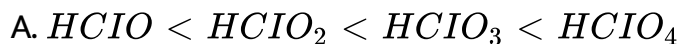


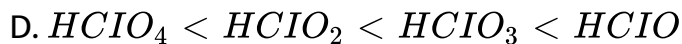
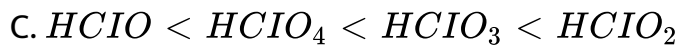
Answer: A



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43. The correct order of acid strength is





Answer: A

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44. Which of the following species is not a pseudo halide ?



Answer: B

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45. The following acids have arranged in the order of decreasing strength. Identify the correct order.

ClOH(I) BrOH(II) IOH(III)

A. $I > II > III$

B. $II > I > III$

C. $III > II > I$

D. $I > III > II$

Answer: A



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46. KF combines with to form KHF_2 . The compound contains the species :

A. K^+ , F^- and H^+

B. K^+ , F^- and HF

C. K^+ and $[HF_2]^-$

D. $[KHF]^+$ and F^-

Answer: C



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47. Bromine can be liberated from potassium bromide solution by the action of

A. iodine solution

B. chlorine water

C. sodium chloride

D. potassium iodide

Answer: B

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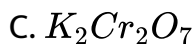
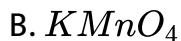
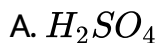
48. Chlorine acts as a bleaching agent only in the presence of

- A. dry air
- B. moisture
- C. sunlight
- D. pure oxygen

Answer: B

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49. HBr and HI can reduce sulphuric acid, HCl can reduced $KMnO_4$ and HF can reduce.....



D. None of these

Answer: A



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Objective Questions li

1. The nitrogen containing compound produced in the reaction of HNO_3 with P_4O_{10}

- A. can also be prepared by reaction of P_4 and HNO_3
- B. is diamagnetic
- C. contains one $N - N$ bond
- D. reacts with Na metal producing a brown gas

Answer: B::D

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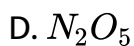
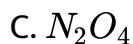
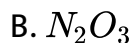
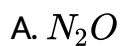
2. The correct statement(s) about O_3 is/are

- A. $O - O$ bond lengths are equal
- B. thermal decomposition of O_3 is endothermic
- C. O_3 is diamagnetic in nature
- D. O_3 has a bent structure

Answer: A::C::D

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3. The nitrogen oxide (s) that contain (s) $N - N$ bonds (s) is (are).



Answer: A::B::C

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4. Ammonia, on reaction with hypochlorite anion, can form

A. NO

B. NH_4Cl

C. N_2H_4

D. HNO_2

Answer: C

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5. White phosphorus (P_4) has

A. six $P - P$ single bonds

B. four $P - P$ single bonds

C. four lone pairs of electrons

D. $P - P - P$ angle of 60°

Answer: A::C::D

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6. Nitrogen (i) oxide is produced by

A. thermal decomposition of NH_4NO_3

B. disproportionation of N_2O_4

C. thermal decomposition of NH_4NO_2

D. interaction of hydroxylamine and nitrous acid

Answer: A::D

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7. The correct statement(s) about the oxoacids, HClO_4 and HClO , is (are)

- A. The central atom in both HClO_4 and HClO is sp^3 -hybridised
- B. HClO_4 is formed in the reaction between Cl_2 and H_2O
- C. The conjugate base of HClO_4 is weaker base than H_2O
- D. HClO_4 is more acidic than HClO because of the resonance stabilisation of its anion

Answer: A::C::D

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8. The colour of the X_2 molecules of group 17 elements changes gradually from yellow to violet down the group. This is due to

- A. decreases in $\pi^* - \sigma^*$ gap down the group
- B. decrease in ionisation energy down the group
- C. the physical state of X_2 at room temperature changes from gas to solid down the group
- D. decreases in $HOMO - LUMO$ gap down the group

Answer: B::C

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9. The compound(s) with two lone pairs of electron on the central atom is (are)



D. SF_4

Answer: B::C

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10. The correct statement(s) regarding,

(i) $HClO$, (ii) $HClO_2$, (iii) $HClO_3$ and (iv) $HClO_4$ is (are)

A. the number of $Cl = O$ bonds in (ii) and (iii) together is two

B. the number of lone pair of electrons on Cl in (ii) and (iii) together is three

C. the hybridisation of Cl in (iv) is sp^3

D. amongst (i) to (iv), the strongest acid is (i)

Answer: B::C

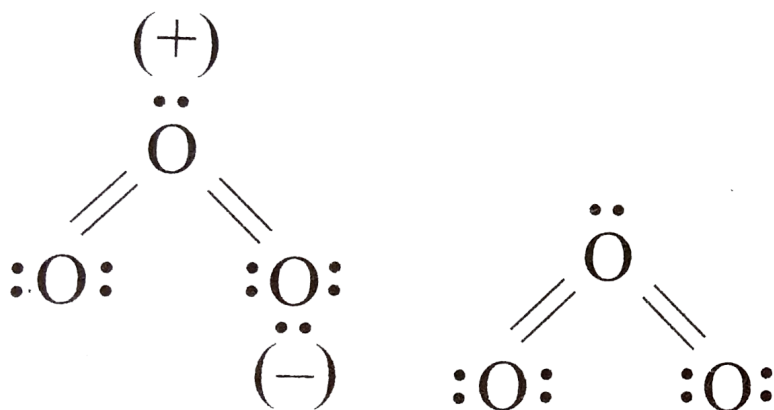
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Assertion And Reason

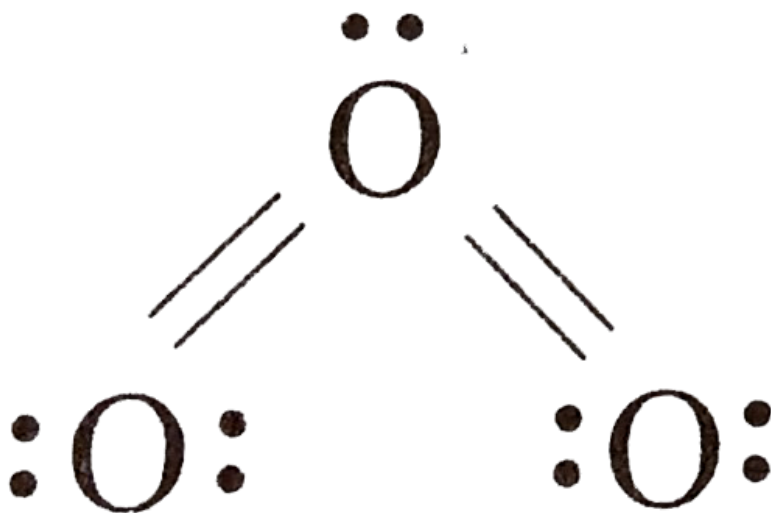
1. Statement I Nitrogen and oxygen are the main components in the atmosphere but these do not react to form oxides of nitrogen.
Statement II the reaction between nitrogen and oxygen requires high temperature.

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2. Assertion: The electronic structure of O_3 is:



Reason: structure is not allowed because octet around O cannot be expanded



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3. Statement I HNO_3 is a stronger acid than HNO_2 .

Statement II In HNO_3 , there are two nitrogen to oxygen bonds whereas in HNO_2 there is only one.

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4. Assertion: Although PF_5 , PCl_5 and PBr_5 are known, the pentahalides of nitrogen have not been observed.

Reason: Phosphorus has lower electronegativity than nitrogen.

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5. Upon heating $KClO_3$ in presence of catalytic amount of MnO_2 , a gas W is formed. Excess amount of W reacts with white phosphorus to give X . The reaction of X with pure HNO_3 gives Y and Z .

W and X are, respectively

A. O_2 and P_4O_{10}

B. O_2 and P_4O_6

C. O_3 and P_4O_6

D. O_3 and P_4O_{10}

Answer: B

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6. There are some deposits of nitrated and phosphates in the earth's crust. Nitrates are more soluble in water. Nitrates are difficult to reduce under laboratory conditions but microbes do it easily. Ammonia forms a large number of complexes with transition metal ions. Hybridisation easily explains the ease of sigma donation capability of NH_3 and PH_3 . Phosphine is a flammable gas and is prepared from white phosphorous.

Which of the following statement is correct ?

- A. Phosphates have no biological significance in humans
- B. Between nitrates and phosphates, phosphates are less abundant in earth's crust

C. Between nitrates and phosphates, nitrates are less abundant in earth's crust

D. Oxidation of nitrates is possible in soil

Answer: C

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7. There are some deposits of nitrated and phosphates in the earth's crust. Nitrates are more soluble in water. Nitrates are difficult to reduce under laboratory conditions but microbes do it easily. Ammonia forms a large number of complexes with transition metal ions. Hybridisation easily explains the ease of sigma donation capability of NH_3 and PH_3 . Phosphine is a flammable gas and is prepared from white phosphorous.

Which of the following statement is correct ?

- A. Between NH_3 and PH_3 , NH_3 is a better electron donor because the lone pair of electrons occupies spherical 's' orbital and is less directional
- B. Between NH_3 and PH_3 , PH_3 is a better electron donor because the lone pair of electrons occupies sp^3 -orbital and is more directional
- C. Between NH_3 and PH_3 , NH_3 is a better electron donor because the lone pair of electron occupies sp^3 -orbital and is more directional
- D. Between NH_3 and Ph_3 , PH_3 is a better electron donor because the lone pair of electrons occupied spherical 's' orbital and is less directional

Answer: C



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8. There are some deposits of nitrates and phosphates in the earth's crust. Nitrates are more soluble in water. Nitrates are difficult to reduce under laboratory conditions but microbes do it easily. Ammonia forms a large number of complexes with transition metal ions. Hybridisation easily explains the ease of sigma donation capability of NH_3 and PH_3 . Phosphine is a flammable gas and is prepared from white phosphorous.

White phosphorous on reaction with $NaOH$ gives PH_3 as one of the products. This is a.

- A. dimerisation reaction
- B. disproportionation reaction
- C. condensation reaction
- D. precipitation reaction

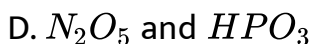
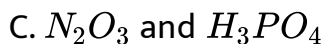
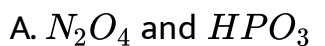
Answer: B

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Passage Based Question

1. Upon heating $KClO_3$ in presence of catalytic amount of MnO_2 , a gas W is formed. Excess amount of W reacts with white phosphorus to give X . The reaction of X with pure HNO_3 gives Y and Z .

Y and Z are, respectively



Answer: A

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2. The reactions of Cl_2 gas with cold-dilute and hot-concentrated NaOH in water give sodium salts of two different oxoacids of chlorine, P and Q, respectively. The Cl_2 gas reacts with SO_2 gas, in presence of charcoal, to give a product R reacts with white phosphorus to give a compound S. On hydrolysis, S gives an oxoacid of phosphorus.

P and Q, respectively, are the sodium salts of

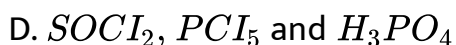
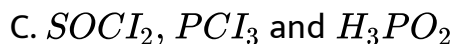
- A. hypochlorous and chloric acids
- B. hypochlorous and chlorous acids
- C. chloric and perchloric acids
- D. chloric and hypochlorous acids

Answer: A

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3. The reactions of Cl_2 gas with cold-dilute and hot-concentrated NaOH in water give sodium salts of two different oxoacids of chlorine, P and Q, respectively. The Cl_2 gas reacts with SO_2 gas, in presence of charcoal, to give a product R reacts with white phosphorus to give a compound S. On hydrolysis, S gives an oxoacid of phosphorus.

R, S and T, respectively, are



Answer: A

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4. Bleaching powder and bleach solution are produced on a large scale and used in several household products. The effectiveness of bleach solution is often measured by iodometry.

25mL of household bleach solution was mixed with 30mL of 0.50MKI and 10mL of 4N acetic acid. In the titration of the liberated iodine, 48mL of $0.25\text{NNa}_2\text{S}_2\text{O}_3$ was used to reach the end point. The molarity of the household bleach solution is :

A. 0.48M

B. 0.96M

C. 0.24M

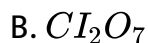
D. 0.024M

Answer: C

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5. Bleaching powder and bleach solution are produced on a large scale and used in several household products. The effectiveness of bleach solution is often measured by iodometry.

Bleaching powder contains a salt of an oxoacid as one of its components. The anhydride of that oxoacid is:



Answer: A

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6. The noble gases have closed-shell electronic configuration and are monatomic gases under normal condition. The low boiling points of the lighter noble gases are due to the weak dispersion forces between the atoms and the absence of other interatomic interactions.

The direct reaction of xenon with fluorine leads to a series of compounds with water oxidation number +2, +4 and +6, XeF_4 reacts violently with water to give XeO_2 . The compound of deduced exhibit inorganic chemistry and their geometries can be deduced considering the total number of electron pairs in the valence shell.

Argon is used in arc welding because of its

A. low reactivity with metal

B. ability to lower the melting point of metal

C. flammability

D. high calorific value

Answer: A

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7. The noble gases have closed-shell electronic configuration and are monatomic gases under normal condition. The low boiling points of the lighter noble gases are due to the weak dispersion forces between the atoms and the absence of other interatomic interactions.

The direct reaction of xenon with fluorine leads to a series of compounds with water oxidation number +2, +4 and +6, XeF_4 reacts violently with water to give

XeO_2 . The compound of deduced exhibit its structure and their geometries can be deduced considering the total number of electron pairs in the valence shell.

The structure of XeO_3 is

- A. linear
- B. planar
- C. pyramidal
- D. T-shaped

Answer: C

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8. Noble gases have completely filled valence shells i.e. m^2sp^2 except He (i.e.). Noble gases are monatomic under normal conditions. The boiling point of the lighter noble gases are due

to weak van der Waals forces between the atoms and absence of any intermolecular interactions Xe reacts with F_2 to give a series of fluorides namely $XeF_2, XeF_4, XeF_4, XeF_3$ on complete hydrolysis gives XeF_3 ,

XeF_4 and XeF_4 are expected to be

- A. oxidising
- B. reducing
- C. unreactive
- D. strongly basic

Answer: B



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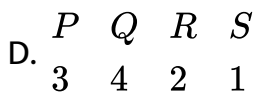
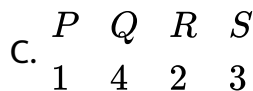
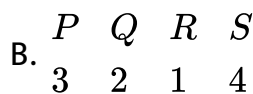
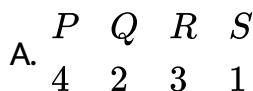
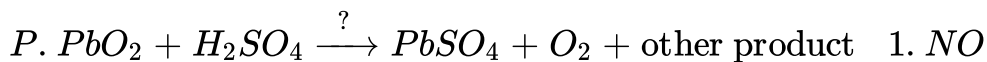
Match The Columns

1. The unbalanced chemical reactions given in Column I show missing reagent or condition (?) which are provided in Column II.

Match Column I with Column II and select the correct answer using the codes given below the Columns.

Column I

Column II



Answer: D



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2. All the compounds listed in Column I react with water. Match the result of the respective reactions with the appropriate options listed in Column II.

- A. *Column I* *Column II*
 $(CH_3)_2SiCl_2$ *p.* Hydrogen halide formation
- B. *Column I* *Column II*
 XeF_4 *q.* Redox reaction
- C. *Column I* *Column II*
 Cl_2 *r.* Reacts with glass
- D. *Column I* *Column II*
 VCl_5 *s.* Polymerisation
 t. O_2 formation

Answer: A::B::C::D



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Fill In The Blanks

1. The lead chamber process involves oxidation of SO_2 by atomic oxygen under the influence of ___ as catalyst.

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2. In P_4O_{10} , the number of oxygen atoms bonded to each phosphorus atom is _____.

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3. The basicity of phosphorus acid (H_3PO_3) is

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4. ___phosphorus is reactive because of its highly strained tetrahedral structure.



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5. The increase in the solubility of iodine in an aqueous solution of potassium iodide is due to the formation of _____ .



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True False

1. Nitric oxide, though an odd electron molecule, is diamagnetic in liquid state.



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2. The $H - H - H$ bond angle in NH_3 is greater than the $H - As - H$ bond angle in AsH_3 .



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3. In aqueous solution, chlorine is a stronger oxidising agent than fluorine.



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4. Dilute HCl oxidises melting Fe to Fe^{2+} .



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5. HBr is a stronger acid than HI because of hydrogen bonding.



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1. The total number of lone pair of electrons in N_2O_3 is

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2. Among the following, the number of compounds that can react with PCl_5 to give $POCl_3$ is $O_2, CO_2, SO_2, H_2O, H_2SO_4, P_4O_{10}$.

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3. Reaction of Br_2 with Na_2CO_3 in aqueous solution gives sodium bromide bromate with evolution of CO_2 gas. The number of sodium bromide molecules involved in the balanced chemical equation is:

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Subjective Question

1. Draw the structure of P_4O_{10} .

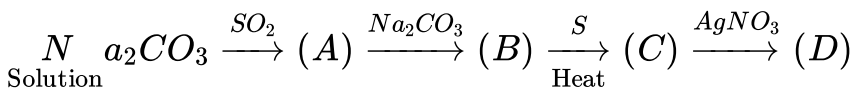
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2. Arrange the following oxides in the increasing order of Bronsted basicity. Cl_2O_7 , BaO , SO_3 , CO_2 , B_2O_3

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3. In the following sequence of reaction, identify the compounds

(A), (B), (C) and (D):



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4. Write the balanced equations for the reactions of the following compounds with water:

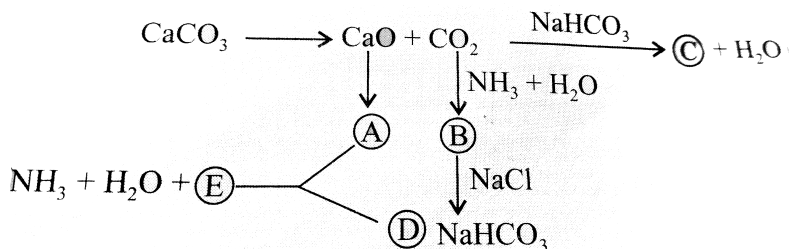
(i) Al_4C_3 (ii) $CaNCN$ (iii) BF_3 (iv) NCI_3 (v) XeF_4

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5. Give reason, why elemental nitrogen exists as a diatomic molecule, whereas elemental phosphorus is a tetratomic molecule.

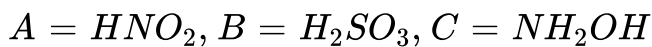
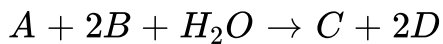
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6. The Haber process can be represented as follows



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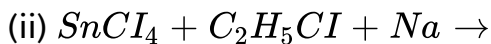
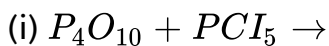
7. In the following equation :



Identify *D*. Draw the structure of *A*, *B*, *C* and *D*.

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8. Complete and balance the following chemical equations.



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9. (a) Thionyl chloride can be synthesised by chlorinating SO_2 using PCl_5 . Thionyl chloride is used to prepare anhydrous ferric chloride starting from its hexahydrated salt. Alternatively, anhydrous ferric chloride can also be prepared from its hexahydrated salt by treating with 2,2-dimethoxypropane. Discuss all this using balanced chemical equations.

(b) Reaction of phosphoric acid with $Ca_3(PO_4)_2$ yields a fertiliser "triple superphosphate" represent the same through balanced chemical equation.

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10. A soluble compound of a poisonous element M , when heated with Zn/H_2SO_4 , gives a colourless and extremely poisonous gaseous compound N , which on passing through a heated tube gives a silvery mirror of element M . Identify M and N .

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11. Write balanced equations for the following.

A. Phosphorus is treated with concentrated nitric acid.

B. Oxidation of hydrogen peroxide with potassium permanganate in acidic medium

C. Manufacture of phosphoric acid from phosphorus.

D. Reaction of aluminium with aqueous sodium hydroxide.

Answer:

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12. Draw the structure of P_4O_{10} and identify the number of single and double $P - O$ bonds.

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13. Account for the following :

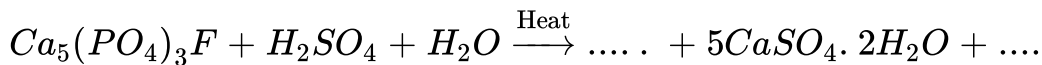
(i) The experimentally determined $N - F$ bond length in NF_3 is greater than the sum of the single bond covalent radii of N and F .

(ii) Mg_3N_2 when reacted with water gives NH_3 but HCl is not obtained from $MgCl_2$ on reaction with water at room temperature.

(iii) $(SiH_3)_3N$ is a weaker base than $(CH_3)_3N$.

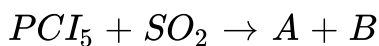
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14. Complete and balance the following reactions.



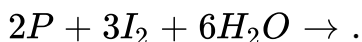
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15. In the following reaction, identify the compounds A and B



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16. Complete and balance the following chemical reactions : Red phosphorus is reacted with iodine in the presence of water of form H_3PO_3 and HI .



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17. Given reasons in two or three sentences only. Sulphur dioxide is a more powerful reducing agent in the alkaline medium than in acidic medium.

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18. Write two resonance structures of ozone which satisfy the octet rule.

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19. Give reason in one or two sentences.

"Ammonium chloride is acidic in liquid ammonia solvent".

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20. Write the balanced chemical equations for the following.

(i) Sodium nitrite is produced by absorbing the oxide of nitrogen in aqueous solution of washing soda.

(ii) Nitrogen is obtained in the reaction of aqueous ammonia with

potassium permanganata.

(iii) Elemental phosphorus reacts with concentrated HNO_3 to give phosphoric acid.

(iv) Sulphur is precipitated in the reaction of hydrogen sulphide with sodium bisulphite solution.

(v) Carbon dioxide is passed through a suspension of limestone in water.

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21. Write the balanced chemical equations for the following reactions.

a. An aqueous solution of sodium nitrite is heated with zinc dust and caustic soda solution.

b. Sodium iodate is added to a solution of sodium bisulphite.

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22. Write two resonance structure of N_2O that satisfy the octet rule.

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23. Write balanced equation for

(i) The preparation of phosphine from CaO and white phosphorus.

(ii) The preparation of ammonium sulphate from gypsum, ammonia and carbon dioxide.

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24. Explain the following

(i) H_3PO_3 is a dibasic acid.

(ii) Phosphine has lower boiling point than ammonia.



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25. Write the balanced chemical equations for the following.

Hypophosphorous acid is heated.

(ii) Sodium chlorate reacts with sulphur dioxide in dilute sulphuric acid medium.



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26. Arrange the following as indicated.

CO_2 , N_2O_5 , SiO_2 and SO_3 in the order of increasing acidic character.



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27. Give balanced equations for the following :

Phosphorous reacts with nitric acid to give equimolar ratio of nitric oxide and nitrogen dioxide.

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28. "The valency of oxygen is generally two, whereas sulphur shows valency of two, four, and six". Explain.

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29. Explain the following in one or two sentences.

A. Magnesium oxide is used for the lining of steel making furnace.

B. The mixture of hydrazine and hydrogen peroxide with a copper (II) catalyst is used as a rocket fuel.

C. Orthophosphorous acid is not tribasic acid.

D. The molecule of magnesium chloride is linear, whereas that of stannous chloride is angular.

Answer:

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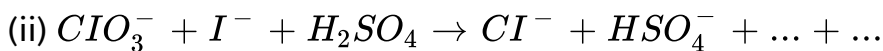
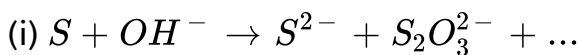
30. Write balanced equations for the following :

(i) Phosphorus is reacted with boiling aqueous solution of sodium hydroxide in an inert atmosphere.

(ii) Dilute nitric acid is slowly reacted with metallic tin.

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31. Complete and balance the following reactions.



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32. Write down the balanced equations for the reaction when calcium phosphate is heated with a mixture of sand and carbon.

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33. Write the resonance structure of nitrous oxide.

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34. Show with balanced equations what happens when the following are mixed: Aqueous solution of ferric sulphate and potassium iodide.

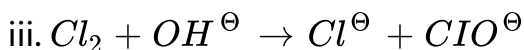
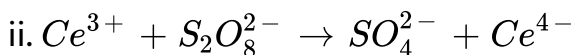
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35. Write the matched set (of three) for each entry in Column A

<i>A</i>	<i>B</i>	<i>C</i>
Asbestos	Paramagnetic	Air pollutant
Lithium metal	Silicates of Ca and Mg	Electron donor
Nitric oxide	Reducing agent	

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36. Complete and balance the following reactions:





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37. Explain why 'orthophosphoric acid, H_3PO_4 , is tribasic but phosphorus acid, H_3PO_3 , is dibasic'.



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38. Give the structural formula for the following :

(i) Phosphorous acid, H_3PO_3

(ii) Pyrophosphoric acid, $H_4P_2O_7$.



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39. (a) Sulphur melts form a clear mobile liquid at $119^\circ C$ but on further heating to $180^\circ C$, it becomes viscous. Why ?

(b) $SOCl_2$ can act as a weak Lewis acid as well as a weak Lewis base. Explain.

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40. Explain the following in not more than two sentences :

(i) Concentrated HNO_3 turns yellow in sunlight.

(ii) Bleaching powder loses its bleaching property when it is kept in an open bottle for a long time.

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41. Write the balanced equation for the reaction of the following compound with water. XeF_4 .

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42. Draw the molecule structures of XeF_2 , XeF_4 and XeO_2F_2 indicating the location of lone pairs of electrons

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43. Give an example of oxidation of halide by another halogen. Explain the feasibility of the reaction.

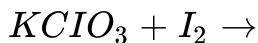
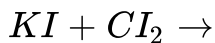
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44. Work out the following using chemical equations:

'Chlorination of calcium hydroxide produces bleaching powder'.

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45. Complete the following chemical equations:



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46. Given reasons in two or three sentences only for

(i) Bond dissociation energy of F_2 is less than that of Cl_2 .

(ii) Sulphur dioxide is a more powerful reducing agent in the alkaline medium than in acidic medium.

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47. Write the balanced chemical equation for the following:

Sodium bromate reacts with fluorine in the presence of alkali.

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48. Arrange the following as indicated. HOCl , HOClO_2 , HOClO_3 , HOClO in increasing order of thermal stability

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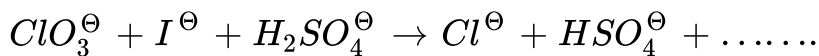
49. Give balanced equations for the following: Iodate ion reacts with bisulphite ion to liberate iodine.

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50. Mention the products formed in the following: "Chlorine gas is bubbled through a solution of ferrous bromide."

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51. Complete and balance the following reactions:



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52. Arrange the following in the order of:

i. Increase bond strength: HCl , HBr , HF , HI

ii. Increasing oxidation number of iodine: I_2 , HI , HIO_4 , ICI

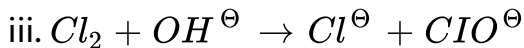
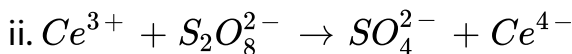
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53. Give reasons in one or two sentence for each of the following:

Fluorine can not be prepared from fluoride by chemical oxidation.

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54. Complete and balance the following reactions:



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55. Explain the following in not more than two sentences :

(i) Concentrated HNO_3 turns yellow in sunlight.

(ii) Bleaching powder loses its bleaching property when it is kept in an open bottle for a long time.



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56. Give reason for the following within two sentences:

i. Hydrogen bromide cannot be prepared by the action of concentrated sulphuric acid on sodium bromide.

ii. When a blue litmus paper is dipped in a solution of hypochlorous acid, it first turns red then gets decolourised.

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57. Write the balanced equation involved in the preparation of

(a) bleaching powder from slaked lime

(b) nitric oxide from nitric acid

(c) chlorine from sodium chloride.

A. bleaching powder from slaked lime

B. nitric oxide from nitric acid

C. chlorine from sodium chloride

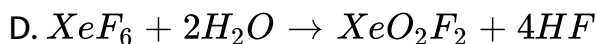
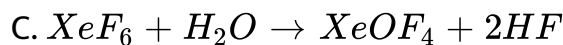
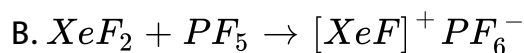
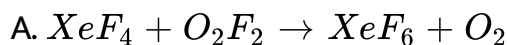
D. anhydrous aluminium chloride from alumina

Answer:

 [Watch Video Solution](#)

Topic 2

1. Which of the following reactions is an example of redox reactions ?



Answer: A



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