

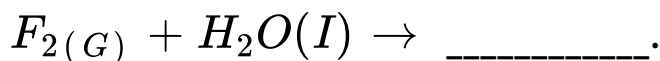
# CHEMISTRY

## BOOKS - BODY BOOKS PUBLICATION

### THE P-BLOCK ELEMENT

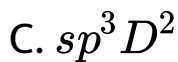
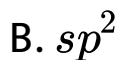
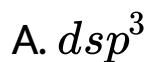
#### Example

1. Complete the given equation



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2. The hybridisation of the central atom in  $BrF_5$  is.



**Answer:**



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3. The order of bond angles as  $NH_3 < PH_3 < AsH_3$ . State whether this statement is true or false?



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4. The halogen which exists only in -1 oxidation state is.

A. Cl

B. F

C. Br

D. I

**Answer:**



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**5.** An atom with high electronegativity has.

A. high ionisation potential

B. low electron affinity

C. small size

D. none of these

**Answer:**



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**6. The reason of lowest boiling point of Helium is**

- A. oxidation state
- B. small size
- C. large size
- D. weak van der Waals' force

**Answer:**



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7. What is the covalence of nitrogen in  $N_2O_5$ ?



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8. Which one has higher electron gain enthalpy with negative sign sulphur or Oxygen ?



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9. \_\_\_\_\_ Is used in filling weather balloons.





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10. Observe the relationship between the first two terms and fill in the blanks Ammonia : Haber process, Nitric Acid : \_\_\_\_\_.



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11. \_\_\_\_\_ is an allotrope of oxygen: It is formed at upper atmosphere by action of UV light on oxygen.



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**12.** Choose correctly matched pairs.

A. Ammonia- contact process

B. Nitric acid - Oswald process

C. Sulphuric acid- Haber process

D.

**Answer:**



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13. " $H_3PO_2$  is a tribasic acid". State whether this statement is true or false ?



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14.  $PH_3$  reacts with HI to form a salt  
\_\_\_\_\_.



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15. Which of the following does not react with  $O_2$  directly Zn, Ti, Pt, Fe?

A. Zn

B. Ti

C. Pt

D. Fe

**Answer:**



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**16. Which aerosols deplete ozone?**



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17. Which one of the following does not exist? i 'XeOF<sub>4</sub>' ii NeF<sub>2</sub> iii XeF iv 'XeF<sub>6</sub>'



**Answer:**



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**18.** Ammonia has a higher boiling point and is less volatile because of.

A. Vanderwaal forces

B. Covalent bond

C. Dipole interaction

D. Hydrogen bond

**Answer:**



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19. \_\_\_\_\_ Compound is used as the covering liquid in refrigerators ?



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20. The most abundant oxidation states of nitrogen are.



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21. Name a disinfectant produced using slakedlime and chlorine. Give its composition.



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22. Name two allotropes of sulphur.



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23. Sketch the structure of  $XeF_4$  Indicating lone pairs of electrons, if any.



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**24.** Write the conditions to maximise the yield of  $H_2SO_4$  in contact process.



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**25.** Arrange the following hydrogen halides in the increasing order of their acidic strength. HI, HBr, HCl, HF.



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26. Explain why in spite of nearly the same electronegativity, oxygen forms hydrogen bonding while chlorine does not.



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27. All halogens except fluorine exhibits +1, +3, +5 and +7 oxidation states in addition to -1 oxidation state. Explain.



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**28.** Element A burns, in nitrogen to give an ionic compound B. The compound B reacts with ' $H_2O$ ' to give 'C' and 'D'. A solution of 'C' becomes milky on bubbling ' $CO_2$ '. Identify 'A, B, C, D'.



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**29.** A metallic element A burns in nitrogen gas to form an ionic compound 'B' which on treatment with water forms 'C' and 'D' solution of 'C' turns milky on bubbling  $CO_2$  gas through it:- Give equations for the formation of C and D from B.



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30. Why does  $PCl_3$  and  $PCl_5$  fumes in moisture?



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31. Both phosphoric and phosphorus acid contains equal number of hydrogen atoms. But  $H_3PO_3$  is dibasic and  $H_3PO_4$  is tribasic. Give reason.



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**32.** Some informations regarding a particular compound is given below:-Greenish yellow gas with pungent smell.With dry slaked lime gives bleaching powder.Acts as a powerful bleaching agent:-Identify the substance.



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**33.** Some informations regarding a particular compound is given below:-Greenish yellow gas with pungent smell.With dry slaked lime gives bleaching powder.Acts as a powerful bleaching

agent:- Give chemical reactions corresponding to Informations (I).



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**34.** Some informations regarding a particular compound is given below:-Greenish yellow gas with pungent smell.With dry slaked lime gives bleaching powder.Acts as a powerful bleaching agent:- Give chemical reactions corresponding to Informations (II).



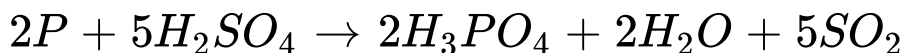
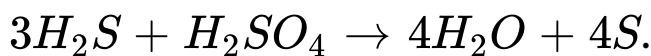
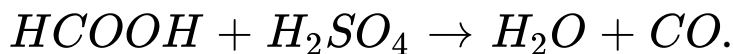
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35. “To Illustrate heterogeneous catalysis and Le Chatelier principle contact process can be used”.



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36. A list of reactions of sulphuric acid are given below.  $Zn + H_2SO_4 \rightarrow ZnSO_4 + 2H_2O + SO_2$ .

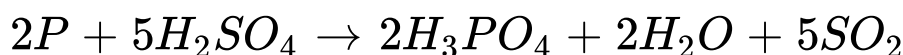
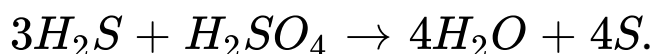
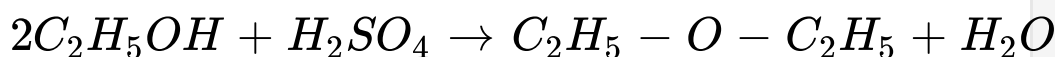


.Classify the reactions Into 3 sets based on the following properties of  $H_2SO_4$ :- Oxidising property.



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37. A list of reactions of sulphuric acid are given below.  $Zn + H_2SO_4 \rightarrow ZnSO_4 + 2H_2O + SO_2$ .



.Classify the reactions Into 3 sets based on the following properties of  $H_2SO_4$ :- Oxidising property.



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38. Why is ICl more reactive than  $I_2$  ?



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39. Why does  $NH_3$  form hydrogen bond but  $PH_3$  does not?



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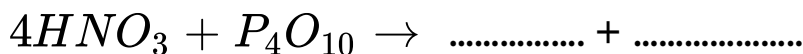
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40. Complete the following reactions:-



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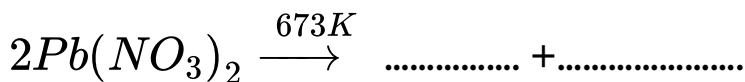
41. Complete the following reactions:-



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42. Complete the following reactions:-



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43. Write main differences between the properties of white phosphorus and red phosphorus.



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44. Give two differences between the properties of the following:-  $PCl_5$  and  $PCl_3$



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45. Account for the following:-  $H_2O$  is a liquid while  $H_2S$  is a gas.



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46. Account for the following:- Compounds of fluorine with oxygen are called fluorides of

oxygen and not the oxides of fluorine.



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47. Account for the following:- Phosphine is a weaker base than  $NH_3$ .



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48. Write balanced equations for the following:-  
The reaction of  $Cl_2$  with cold and dilute NaOH.



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**49.** Write balanced equations for the following:-

NaCl is heated with sulphuric acid In the presence of  $MnO_2$ .



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**50.** In the manufacture of sulphuric acid the Initial product obtained is oleum:- What is oleum ?



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**51.** In the manufacture of sulphuric acid the Initial product obtained is oleum:-Write the chemical equation for the conversion of oleum to sulphuric acid.



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**52.**  $XeF_2$ ,  $XeF_6$  are Important fluorides of Xenon:- How are they prepared ?



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**53.**  $XeF_2$ ,  $XeF_6$  are Important fluorides of Xenon:- Explain the action of water on  $XeF_2$  and  $XeF_6$ .



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**54.** Account for the following:- Nitrogen and chlorine have same electro-negativity but nitrogen is inert at room temperature while chlorine is highly reactive.



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55. Account for the following:-Sulphuric acid shows oxidising property, and dehydrating property.



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56. What are interhalogen compounds? Write any two examples.



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57.  $\text{ClF}_3$  exists but  $\text{FCl}_3$  does not. Why?

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58. Give reason for the following:-  $H_3PO_3$  is diprotic whereas  $H_3PO_4$  is triprotic.

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59. Give reason for the following:- HF is liquid but HCl is gas.

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60. Why is  $N_2$  less reactive at room temperature?



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61. Account for the following:- Bleaching action of  $Cl_2$ .



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62. Give reasons for the following elemental phosphorus doesnot exist as  $P_2$  molecule:- While nitrogen exist as  $N_2$  molecule.



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**63.** Give reasons for the following:- i. elemental phosphorus does not exist as  $P_2$  molecule ii. Noble gases are known as Inert gases.



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**64.** Assign reason for the following:- The negative Value of electron gain enthalpy of fluorine is less than that of Cl.



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65. Assign reason for the following:- Of the noble gases only xenon is known to form well-established chemical compounds.



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66.  $4H_3PO_3 \xrightarrow{\text{heat}} 3H_3PO_3 + PH_3$ . Show that this is a disproportionation reaction.



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**67.** Phosphorus of group-15 and sulphur of group-16 are two industrially important 'p' block elements. Their compounds are also industrially important.  $PCl_3$  fumes in moisture. Give reason.



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**68.** Phosphorus of group-15 and sulphur of group-16 are two industrially important 'p' block elements. Their compounds are also industrially important. Sulphuric acid can be manufactured

from sulphur using  $V_{20} - 5$  catalyst., Give the name of the method.



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**69.** Phosphorus of group-15 and sulphur of group-16 are two industrially important 'p' block elements Their, compounds are also industrially important. Sulphuric acid can be manufactured from sulphur using  $V_{20} - 5$  catalyst., Outline the principle



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70. After a discussion about the structures of hydrides of group-15 elements, .Neethu wrote the order of bond angles as  $NH_3 < PH_3 < AsH_3$ . Give the hybridization and shape of these hydrides.



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71. After a discussion about the structures of hydrides of group-15 elements, .Neethu wrote the order of bond angles as  $NH_3 < PH_3 < AsH_3$ . Also arrange the above hydrides in the increasing

order of their thermal stability. Justify your answer.



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**72.** Arrange the following in the decreasing order of the property indicated:-  
 $H_2O$ ,  $H_2S$ ,  $H_2Se$ ,  $H_2Te$  - Boiling point.



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**73.** Arrange the following in the decreasing order of the property indicated:-

$NH_3$ ,  $PH_3$ ,  $AsH_3$ ,  $SbH_3$  - Basic strength.



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74. Which one of the following does not exist? i

'XeOF<sub>4</sub>' ii NeF<sub>2</sub> iii XeF iv 'XeF<sub>6</sub>'



**Answer:**





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**75.** Which aerosols deplete ozone?



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**76.** Why does  $\text{NH}_3$  form hydrogen bond but  $\text{PH}_3$  does not?



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77. The HNH angle value is higher than HPH, HAsH and HSbH angles. Why?



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78. Why does  $R_3P = O$  exist but  $R_3N = O$  does not. [R = alkyl group]?



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79. Write two uses of  $ClO_2$



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**80.** What Inspired N. Bartlett for carrying out reaction between 'Xe and 'PtF<sub>6</sub> ?'



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**81.** Why are halogens strong oxidizing agents?



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**82.** Explain why fluorine forms only one oxoacid  
HOF?



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**83.** How is  $\text{SO}_2$  an air pollutant?



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**84.** The product obtained by the reaction of calcium phosphide with water is

- A. Phosphoric acid
- B. Phosphine
- C. Phosphorous acid

D. Phosphorus trichloride

**Answer:**



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**85.** In the presence of light, chloroform is slowly oxidised by air to an extremely poisonous gas called\_\_\_\_\_.



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86. The composition of bleaching powder  $Ca(OCl)_2$ . Give one method for the preparation of bleaching powder.



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87. Why is  $N_2$  less reactive at room temperature?



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88. Account for the following:  $PCl_3$  fumes in moisture.



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89. Account for the following:  $Cl_2$ , is a powerful bleaching agent.



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90. Account for the following:  $H_3PO_3$  is dibasic.



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91. The weakest reducing agent among the hydride of groups 15 elements is .....



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92. Draw the structure of  $H_3PO_2$  and account for its reducing character.



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93. What are Interhalogen compounds? Which Interhalogen compound is used to fluorinate



Uranium? How Is it prepared?



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**94.** Write the chemical equation of the following reactions:- Preparation of  $XeO_3$  from  $XeF_6$ .



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**95.** Write the chemical equation of the following reactions:- Mixing  $PtF_6$  and Xe.



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**96.** Formula of the oxide of a metal M is  $\text{MO}$ . The formula of its phosphate is



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**97.** How phosphine is prepared in laboratory?



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**98.** Assign the possible reason for the following:-  
Stability of +5 oxidation state decreases and that

of +3 oxidation state increases down to 15th? group elements.



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**99.** Assign the possible reason for the following:-

$H_2O$  is less acidic than  $H_2S$ .



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**100.** Assign the possible reason for the following:-

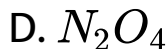
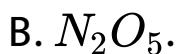
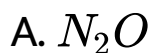
$H_3PO_2$  act as a good reducing agent while

$H_3PO_4$  does not.



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**101.** Nitrogen forms a number of oxides and oxoacids. Which of the following is a neutral oxide of Nitrogen?  $N_2O$ ,  $N_2O_5$ ,  $NO_2$ ,  $N_2O_4$



**Answer:**



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**102.** Nitrogen forms a number of oxides and oxoacids. Prepare a short write-up on Nitric acid highlighting its laboratory preparation, chemical properties and uses.



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**103.** Phosphorous forms a number of compounds:- The gas liberated when calcium phosphide is treated with *dil. HCl* is.

A.  $CI_2$

B.  $H_2$

C.  $PH_3$

D. All the above

**Answer:**



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**104.** Nitrogen forms a number of oxides and oxoacids. Prepare a short write up on  $PCl_3$  and

$PCl_4$  highlighting the preparation and chemical properties of  $PCl_5$  and structure of  $PCl_5$ .



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105. Account for the following:  $NH_3$  acts as a Lewis base.



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106. Account for the following:  $PCl_3$  fumes in moisture.



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**107.** Account for the following: Fluorine shows only-1 oxidation state.



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**108.** Suggest any two fluorides of Xenon



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**109.** Write a method to prepare any one of the above mentioned X Xenon fluorides. “



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**110.** Account for the following:-  $H_2O$  is a liquid while  $H_2S$  is a gas.



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**111.** Account for the following: Noble gases have very low boiling points.



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**112.** Account for the following:-  $NO_2$  dimerises to  $N_2O_4$ .



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**113.** What are interhalogen compounds? Write any two examples.



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**114.** Suggest any two examples of Interhalogen compounds,



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**115.** Some elements in p-block shows allotropy.  
What are the allotropic forms of sulphur?



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**116.** Some elements in p-block shows allotropy.  
How will-you manufacture Sulphuric Acid by

contact process?



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**117.** Some elements in p-block shows allotropy.

What are inter halogen compounds?



**Watch Video Solution**

**118.** Some elements in p-block shows allotropy.

Name two oxoacids of Sulphur.



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**119.** Some elements in p-block shows allotropy.

How will you manufacture ammonia by Haber process?



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**120.** Some elements in p-block shows allotropy.

Write any two uses of inert gases.



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**121.** Compounds of nitrogen, phosphorus and sulphur such as ammonia, phosphoric acid and sulphuric acid are used in fertilizer industry. Describe Haber process for the manufacture of ammonia.



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**122.** Compounds of nitrogen, phosphorus and sulphur such as ammonia, phosphoric acid and sulphuric acid are used in fertilizer industry. Write

the chemical equation for the preparation of phosphoric acid ( $H_3PO_4$ ) from  $H_3PO_3$



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**123.** Compounds of nitrogen, phosphorus and sulphur such as ammonia, phosphoric acid and sulphuric acid are used in fertilizer industry:- Describe contact process for the manufacture of sulphuric acid.



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**124.** The elements in which the last electron enters into the p-orbitals of their outer-most shell are called p-blocks elements:- Name two allotrops of sulphur.



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**125.** The elements in which the last electron enters into the p-orbitals of their outer-most shell are called p-blocks elements:- Give a method for the preparation of phosphine.



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**126.** Phosphorus is an essential constituent of both the plants and animals.

Phosphorus is stored under water. Give reason.



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**127.** Give a reaction which indicates dehydration property of con.  $H_2SO_4$



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**128.** Nitrogen forms number of oxides in the different oxidation states. Write the names and structural formulae of any four oxides of nitrogen.



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**129.** Boiling point of  $H_2O$  (373K) is very much higher than that of  $H_2S$  (213 K). Give reason.



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**130.** Suggests method for the quantitative estimation of ozone ( $O_3$ ).



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**131.** What are the products obtained when copper reacts with concentrated nitric acid?



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**132.** Name two important xenon fluorides.



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**133.** Give the structure of the above xenon fluorides..



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**134.** Interhalogen compounds are compounds formed by combination of different halogen atoms. Which are more reactive, halogens or interhalogen compounds? Give reason



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**135.** Important allotropic forms of phosphorus are white phosphorus, red phosphorus and black phosphorus. Among these, which allotropic form is more reactive? Why



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**136.** In the manufacture of sulphuric acid ( $H_2SO_4$ ), the final product obtained is oleum. Write chemical equation for the conversion of oleum to sulphuric acid.



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**137.** Name the halogen-which forms only one oxo acid and also write the formula of the oxo acid of that halogen.



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**138.** Which element among inert gases form, maximum number of compounds? Write the formula of one of the compounds formed by the element.



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**139.**  $4H_3PO_3 \xrightarrow{\text{heat}} 3H_3PO_3 + PH_3$ . Show that this is a disproportionation reaction.



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**140.**  $PCl_3$  fumes in moist air. Give reason.



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**141.** Sulphuric acid can be manufactured from sulphur using  $V_2O_5$  as catalyst:- Give the name of

the method.



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**142.** Phosphorus of group-15 and sulphur of group-16 are two industrially important 'p' block elements Their, compounds are also industrially important. Sulphuric acid can be manufactured from sulphur using  $V_{2O_5}$  catalyst., Outline the principle



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**143.** Discovery, of Haber's process for manufacture of ammonia is considered to be one of the principal discoveries of twentieth century. Which is the promoter used in the earlier process when iron was used as catalyst?



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**144.** Discovery, of Haber's process for manufacture of ammonia is considered to be one of the principal discoveries of twentieth century. What is

the temperature condition for maximum yield of ammonia? Justify.



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145. Which noble gas is not found in the atmosphere?



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146. Comment on the stabilities of  $ClF_3$  and  $IF_3$ .



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**147.** Which compound is used in the preparation of caprolactum?



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**148.** Which among the following forms basic oxide?

A. Phosphorous

B. Nitrogen

C. Bismath

D. Antimony

**Answer:**



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**149.** Why does ozone act as a powerful oxidising agent?



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**150.** Elements in the groups 13 to 18 in the periodic table constitute the 'p' block elements. Name the most important oxo acid of nitrogen



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**151.** Element in the groups 13 to 18 in the periodic table constitutes the p block element:- Name the process for production of nitric acid.



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**152.** In contact process for the industrial manufacture of  $H_2SO_4$  some amount of  $H_2SO_4$  is used as a raw material. Give reason.



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**153.** Which noble gas is not found in the atmosphere?



**Watch Video Solution**

**154.** Comment on the stabilities of  $ClF_3$  and  $IF_3$ .



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**155.** p block element consists of metals, non-metals and noble gases:- Which are the two

allotropic forms of S that have  $S_8$  units in the structure?



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**156.** Name two important xenon fluorides.



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**157.** Give the structure of the above xenon fluorides..



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