ASSIGNMENTS

Very short answer type questions:

1) PH_3 has lower boiling point than NH_3. Explain.

2) Why are halogens coloured?

3) What are chalcogens?

4) Which noble gas is Radioactive?

5) Explain why fluorine always exhibit an oxidation state of - 1 only.

6) Which compound led to the discovery of compounds of noble gas?

7) Name the most electronegative element.

8) Why is OF_6 compound not known?

9) Why is N_2 not particularly reactive?

10) Ammonia acts as ligand. Explain.

Short answer type questions:

1) White Phosphorous is more reactive than red phosphorous. Explain.
2) Why do noble gases have comparatively large atomic sizes?

3) Arrange in decreasing order of Ionic character

M – F, M – Cl, M – Br, M – I

4) Phosphinic acid(H_3PO_2) behave as a monoprotic acid

5) Arrange the following in the order of property indicated:

a)AS_2O_3, ClO_2, GeO_2, Ga_2O_3 : Increasing acidity

b) H_2O, H_2S, H_2Se, H_2Te : Increasing acid strength.

6) Arrange in decreasing order of bond energy: F_2, Cl_2, Br_2, I_2

7) Complete the following:

i) $HNO_3 + P_4O_{10} \rightarrow$

ii) $IO^-_3 + I^- + H^+ \rightarrow$

8) Give the chemical reactions in support of following observations:

a) The +5 oxidation state of Bi is less stable than +3 oxidation state.

b) Sulphur exhibits greater tendency for catenation than selenium.

9) How would you account for following?

i)Enthalpy of dissociation of F_2 is much less than that of Cl_2.

ii)Sulphur in vapour state exhibits paramagnetism.

10) Draw structures of following:

a)Peroxomonosulphuric acid (H_2SO_5)

b)XeF_4

Level – III

1. Complete and balance:

i) $F_2 + H_2O$ Cold →

ii) $BrO^-_3 + F_2 + OH^-$→

iii) $Li + N_2$ (cold) →

iv) $NH_3 + NaOCl$→

2) Despite lower electron affinity of F_2, is stronger oxidising agent than Cl_2. Explain.

3) Give reasons:

a) Nitric oxide becomes brown when released in air.

b) PCl5 is ionic in nature in the solid state.

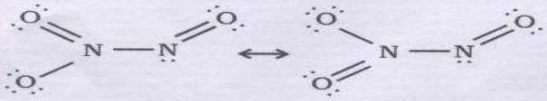
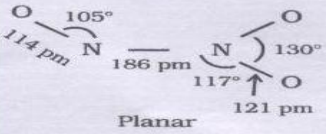
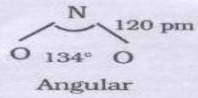
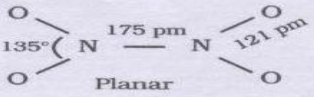
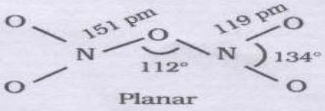
4) Which of the two is more covalent $SbCl_3$ or $SbCl_5$?

5) Addition of Cl_2 to KI solution gives if brown colour but excess at if turns it colourless. Explain.

Identify hybridization state of central atom and use concept of VSEPR theory .also its shape (geometry) and draw the structure.

PCl_3	sp^3	bp=3	lp=1	Pyramidal

PCl_5	sp^3d	bp=5	lp=0	Trigonalbipyramid
BrF_3	sp^3d	bp=3	lp=2	T- Shape
XeF_2	sp^3d	bp=2	lp=3	Linear
XeF_4	sp^3d^2	bp=4	lp=2	Sq Plane
$XeOF_4$	sp^3d^2	bp=5	lp=1	Sq Pyramid
XeO_3	sp^3	bp=3	lp=1	Pyramidal
XeF_6	sp^3d^3	bp=6	lp=1	Distorted Octahedral
SF_4	sp^3d	bp=4	lp=1	Sea Saw

Formula	Resonance Structures	Bond Parameters
N_2O	$\ddot{N}=N=\ddot{O} \longleftrightarrow :N\equiv N-\ddot{O}:$	N — N — O 113 pm 119 pm Linear
NO	$:N=\ddot{O}: \longleftrightarrow :\dot{N}=\ddot{O}:$	N — O 115 pm
N_2O_3		 Planar
NO_2		 Angular
N_2O_4		 Planar
N_2O_5		 Planar

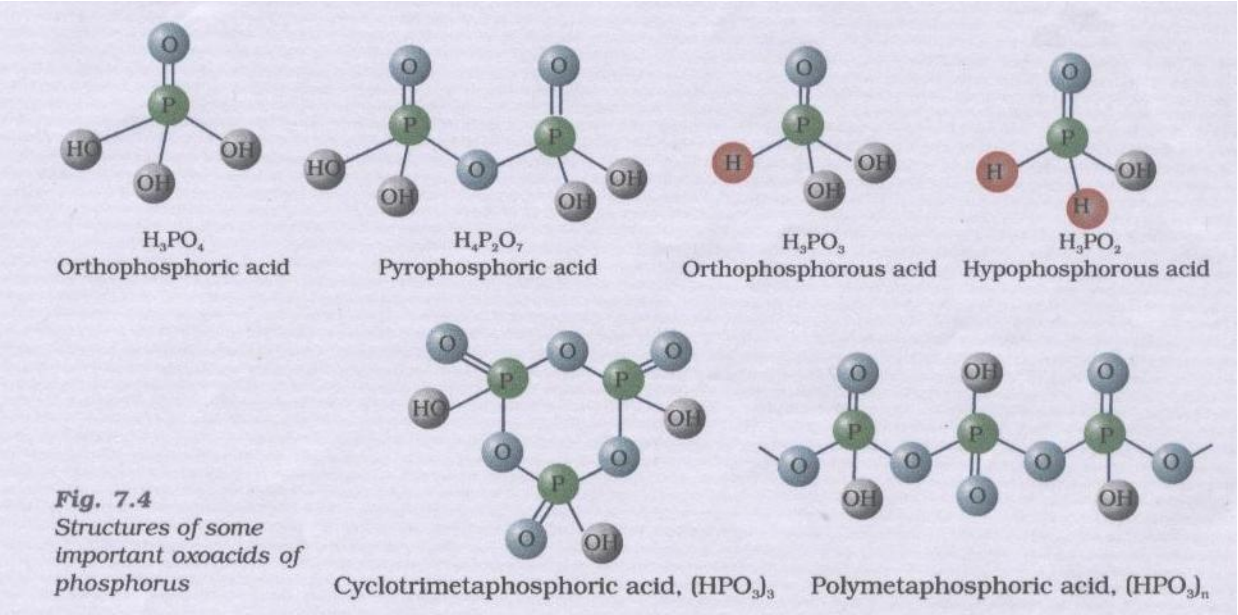
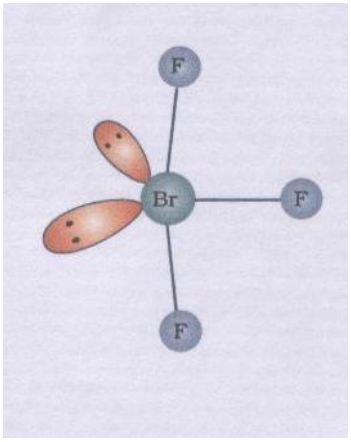
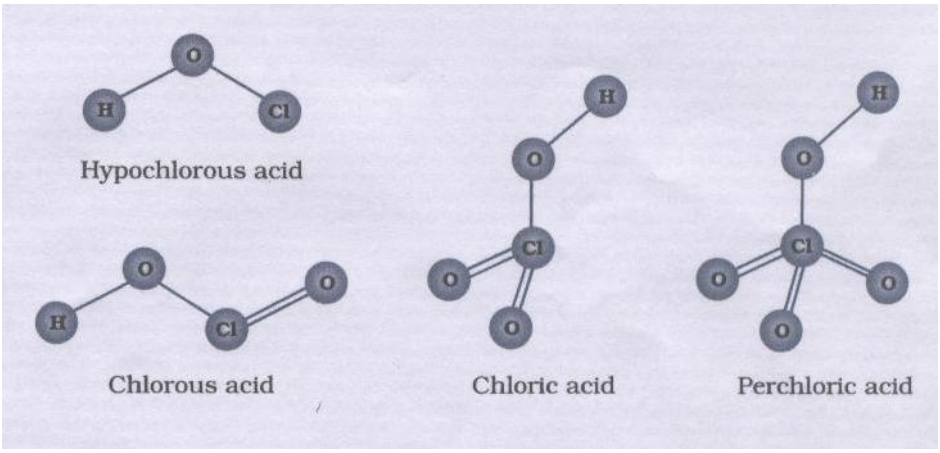


Fig. 7.4 *Structures of some important oxoacids of phosphorus*





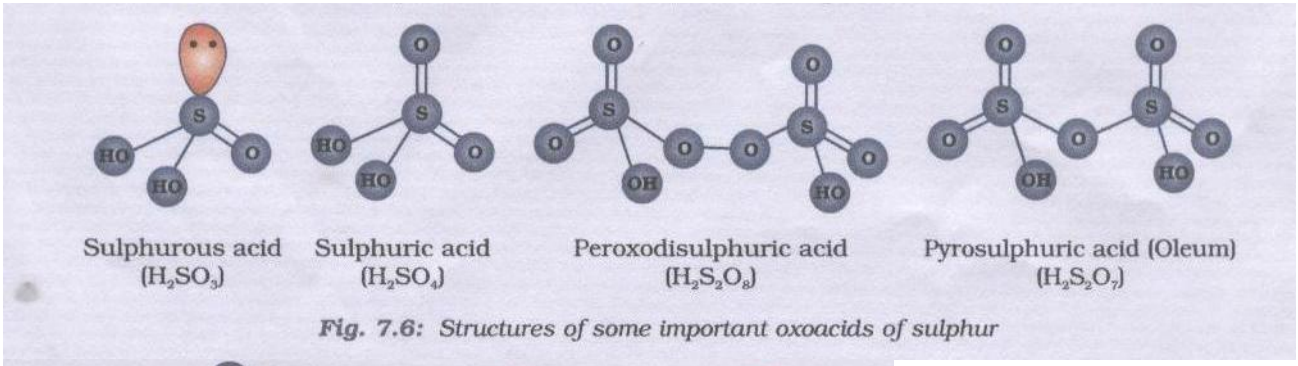


Fig. 7.6: Structures of some important oxoacids of sulphur