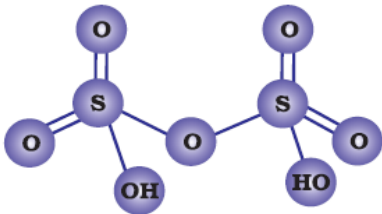
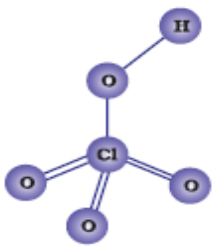


VALUE POINTS

1. In oxycacids, the element always exhibit +ve oxidation states. But as F is the most electronegative element, it shows an oxidation state of -1 alone. 1

2. $6\text{NaOH} + 3\text{Cl}_2 \rightarrow 5\text{NaCl} + \text{NaClO}_3 + 3\text{H}_2\text{O}$ 1
3. No, the products of hydrolysis are XeOF_4 and XeO_2F_2 where the oxidation states of all the elements remain the same as it was in the reacting state. $(\frac{1}{2} + \frac{1}{2})$ 1
4. a) $4\text{Zn} + 10\text{HNO}_3(\text{dilute}) \rightarrow 4\text{Zn}(\text{NO}_3)_2 + \text{N}_2\text{O} + 5\text{H}_2\text{O}$ $(\frac{1}{2} + \frac{1}{2})$ 2
 b) $2\text{I}^- + \text{H}_2\text{O} + \text{O}_3 \rightarrow 2\text{OH}^- + \text{O}_2 + \text{I}_2$ $(\frac{1}{2} + \frac{1}{2})$ 2
5. 2
 - a) 
 - b)  (1 + 1)
6. Ozone is treated with excess of KI solution buffered with a borate buffer. 1
 $2\text{KI} + \text{H}_2\text{O} + \text{O}_3 \rightarrow 2\text{KOH} + \text{I}_2 + \text{O}_2$ +
 The liberated iodine is titrated with a standard solution of sodium thioisulphate. From the volume of sodium thiosulphate used the amount of ozone is estimated. 1
7. a) Square pyramidal B.P = 5 , L.P = 1 $(\frac{1}{2} + \frac{1}{2})$ 2
 b) Trigonal pyramidal B.P = 3 , L.P = 1 $(\frac{1}{2} + \frac{1}{2})$ 2
8. a) $\text{HF} < \text{HCl} < \text{HBr} < \text{HI}$ (1) 3
 b) $\text{BiH}_3 > \text{SbH}_3 > \text{NH}_3 > \text{AsH}_3 > \text{PH}_3$ (1)
 c) $\text{HClO} > \text{HClO}_2 > \text{HClO}_3 > \text{HClO}_4$ (1)
9. 3

$$4\text{NH}_3 + 5\text{O}_2 \xrightarrow{\text{Pt / Rh catalyst}} 4\text{NO} + 6\text{H}_2\text{O} \quad (1)$$
 This is further oxidized to NO_2

$$\text{NO} + \text{O}_2 \rightarrow 2\text{NO}_2 \quad (1)$$
 NO_2 is dissolved in water to give HNO_3

$$3\text{NO}_2 + \text{H}_2\text{O} \rightarrow 2\text{HNO}_3 + \text{NO} \quad (1)$$
 HNO_3 is concentrated to 68% by distillation and is further concentrated to 98% by dehydration using conc. H_2SO_4
10. a) Due to the higher oxidation state of metal in penta halides, they have larger polarizing power and can polarize the halide ion to a greater extent than the corresponding tri halide. Thus larger the polarizing power, larger is the covalent character. 3
 b) Fluorine being the most electronegative element can un pair the electrons of sulphur and thus increases the oxidation state of S to +6. But hydrogen being less electronegative cannot oxidize S to +6 oxidation state.
 c) The promotion of 1, 2 or 3 electrons from 5p filled orbital to vacant 5d orbital will give rise to 2, 4 and 6 half -filled orbitals. So Xe can combine with even but not with odd number of fluorine atoms.