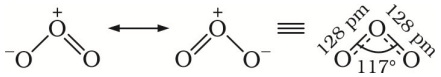
151.(ACD)



Oxygen-oxygen bond length are equal (128 pm). All electrons are paired so it is diamagnetic in nature. It has a bent structure.

Thermal decomposition of O_3 is exothermic process.

$$2O_3 \xrightarrow{\Delta} 3O_2 + 68\,kcal$$

152.(A) $Cl_2 + SO_2 \xrightarrow{charcoal} \underset{(R)}{SO_2Cl_2}$

$$\underset{(R)}{10SO_2Cl_2} + P_4 \longrightarrow \underset{(S)}{4PCl_5} + 10SO_2$$

$$\underset{(S)}{PCl_5} + 4H_2O \longrightarrow \underset{(T)}{H_3PO_4} + 5HCl$$

153.(A) $Cl_2 + 2NaOH(dil.) \xrightarrow{cold} NaCl + \underset{(P)}{NaOCl} + H_2O$

$$3Cl_2 + 6NaOH(conc.) \xrightarrow{hot} 5NaCl + \underset{(Q)}{NaClO_3} + 3H_2O$$

(P) and (Q) are salts of hypochlorus acid (HOCl) and chloric acid ($HClO_3$) respectively.

154.(D) **P :** $PbO_2 + H_2SO_4 \xrightarrow{warm} PbSO_4 + \frac{1}{2}O_2 + H_2O$

Q : $Na_2S_2O_3 + 5H_2O \xrightarrow{+4Cl_2} 2NaHSO_4 + 8HCl$

R : $N_2H_4 \xrightarrow{+2I_2} N_2 + 4HI$

S : $XeF_2 \xrightarrow{+2NO} Xe + 2NOF$

155.(A) $\underset{(white)}{P_4} + 8SOCl_2 \longrightarrow 4PCl_3 + 4SO_2 + 2S_2Cl_2$

156.(7) $6KI + K_2Cr_2O_7 + 7H_2SO_4 \longrightarrow 4K_2SO_4 + Cr_2(SO_4)_3 + 3I_2 + 7H_2O$

$2CuSO_4 + 4KI \longrightarrow Cu_2I_2 + 2K_2SO_4 + I_2$

$H_2O_2 + 2KI \longrightarrow I_2 + 2KOH$

$Cl_2 + 2KI \longrightarrow 2KCl + I_2$

$O_3 + 2KI + H_2O \longrightarrow 2KOH + I_2 + O_2$

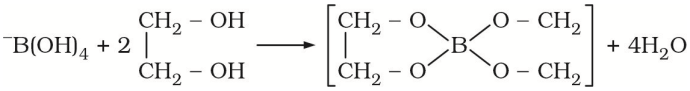
$2FeCl_3 + 2KI \longrightarrow 2FeCl_2 + 2KCl + I_2$

$4HNO_3 + 2KI \longrightarrow 2KNO_3 + 2NO_2 + I_2 + 2H_2O$

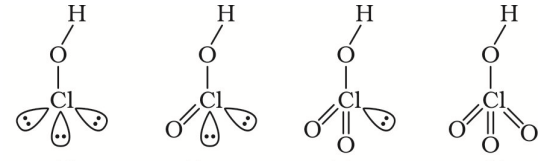
157.(BD) H_3BO_3 does not undergoes self ionization. However, it acts as a weak acid in water (hence it is a weak electrolyte in water).

$$H_3BO_3 + H_2O \rightarrow B(OH)_4^- + H^+$$

Addition of cis-diols (e.g., ethyl glycol) to aqueous solution of orthoboric acid leads to complex formation, thus acidity of aqueous solution of orthoboric acid is increased.



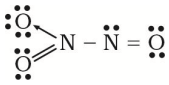
158.(BC)



In all these oxoacids, Cl is sp^3 - hybridized

Acid strength of oxoacids of the same halogen increases with increase in oxidation number of the halogen, e.g., $\overset{+7}{H}Cl\overset{}{O}_4 > H\overset{+5}{Cl}O_3 > H\overset{+3}{Cl}O_2 > H\overset{+1}{Cl}O_4$

159.(B) $(CH_3)_2SiCl_2$ form linear polymer on hydrolysis and $(CH_3)_3SiCl$ is a terminator.

160.(8) 

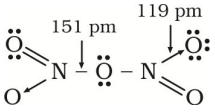
Number of lone pairs = 8

161.(6) $3B_2H_6 + 18CH_3OH \longrightarrow 6B(OCH_3)_3 + 18H_2$

162.(BD) $P_4O_{10} + 4HNO_3 \rightarrow 2N_2O_5 + 4HPO_3$

N_2O_5 cannot be obtained by reaction of P_4 and HNO_3

$P_4 + 20HNO_3 \rightarrow 20NO_2 + 4H_3PO_4 + 4H_2O$



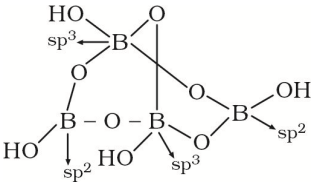
It is diamagnetic and does not have N – N bond

N_2O_5 is decomposed by alkali metals

$N_2O_5 + Na \rightarrow NaNO_3 + \underset{\text{(Brown gas)}}{NO_2}$

163.(A) Atomic radii increases on moving down a group. However due to poor shielding effect of d-orbit, atomic radius of Ga is smaller than Al (anomaly). Thus the correct order is Ga < Al < In < Tl

164.(ACD) Structure of borax



Correct formula of borax is $Na_2[B_4O_5(OH)_4]\cdot 8H_2O$

(A) Borax has tetranuclear $[B_4O_5(OH)_4]^{2-}$ unit

(B) Only two 'B' atom lie in same plane

(C) Two bromon are sp^2 and two are sp^3 hybridised

(D) One terminal hydroxide per boran atom