76. The dark brown ppt. that initially appears on addition of KI solution to $Bi(NO_3)_3$ solution is due to free iodine liberated as follows :

$Bi(NO_3)_3$ is hydrolysed to form HNO_3. The HNO_3 formed, being an oxidising agent, liberates I_2 from KI.

$$Bi(NO_3)_3 + H_2O \longrightarrow [Bi(OH)(NO_3)_2] + HNO_3$$

$$\underset{\text{(from } HNO_3)}{NO_3^- + 4H^+ + 3e^-} \longrightarrow NO + H_2O] \times 2$$

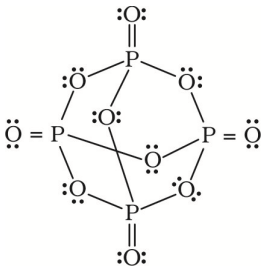
$$\underset{\text{(from KI)}}{2I^-} \longrightarrow I_2 + 2e^-] \times 3$$

$$2NO_3^- + 8H^+ + 6I^- \longrightarrow 2NO + 4H_2O + \underset{\text{(Brown ppt.)}}{3I_2\downarrow}$$

In excess of KI, I_2 gets dissolved due to formation of complex KI_3 (i.e., I_3^-) to give a clear yellow solution.

$$KI + I_2 \longrightarrow \underset{\substack{\text{(soluble}\\\text{yellow solution)}}}{KI_3}$$

77.



Number of $P-O$ bonds (single bonds) = 12 ; Number of $P=O$ bonds (single bonds) = 4

78.(B) $Na_2SO_3 + S \xrightarrow[\text{medium}]{\text{In alkaline}} Na_2S_2O_3$

79.(D) Due to inert pair effect

80.(A) CO is an example of neutral oxide

81.(B) Pseudohalides are monovalent ions made by an electronegative atom and have properties similar to those of halide ions. The corresponding dimers of pseudohalides are known as pseudohalgens. $RCOO^-$ is not a pseudohalide.

82. The poisonous element may be As. Thus we have

$$\underset{\text{(Soluble)}}{AsCl_3} + 6H \xrightarrow{An/HCl} \underset{\substack{\text{'N'}\\\text{(poisonous gas)}}}{AsH_3} + 3HCl$$

$$2AsH_3 \xrightarrow{\Delta} \underset{\substack{\text{'M'}\\\text{(silvery mirror)}}}{2As} + 3H_2\uparrow$$

Hence M = As and N = AsH_3

83.

$$[2HNO_3 \rightarrow H_2O + 2NO_2 + [O]] \times 5$$

$$2P + 5O + 3H_2O \rightarrow 2H_3PO_4$$

$$2P + 10HNO_3 \rightarrow 2H_3PO_4 + 10NO_2 + 2H_2O$$

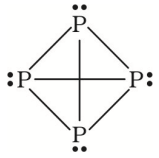
84. **(a)** $2KI + Cl_2 \longrightarrow I_2$

Cl_2 lies above I_2 in electrochemical series so Cl_2 is more powerful oxidising agent than I_2. Thus Cl_2 can displace I^- to form I_2.

(b) $2KClO_3 + I_2 \longrightarrow 2KIO_3 + Cl_2$

85.(ACD)

In P_4 (white phosphorus), the four atoms are situated at the corners of a tetrahedron. There are six $P-P$ single bonds with $P-P-P$ bond angle of 60°. Each P has a lone pair of electrons.



86.(ABD)

When heated above 500°C, $NaNO_3$ decomposes to give $NaNO_2$ and oxygen.

$$2NaNO_3 \xrightarrow{\text{above } 500^\circ C} 2NaNO_2 + O_2\uparrow$$

On further heating to above 800°, $NaNO_2$ further decomposes to give Na_2O, N_2 and O_2.

$$2NaNO_2 \xrightarrow{\text{above } 800^\circ C} Na_2O + \frac{3}{2}O_2\uparrow + N_2$$

87. $Ca_5(PO_4)_3F + 7H_3PO_4 \rightarrow \underset{\substack{\text{Triple super phosphate}\\(\text{Fertilizer})}}{5Ca(H_2PO_4)_2} + HF$

88. $SO_2 + PCl_5 \rightarrow \underset{\text{Thionyl chloride}}{SOCl_2} + POCl_3$

$FeCl_3 \cdot 6H_2O + 6SOCl_2 \rightarrow FeCl_3 + 12HCl + 6SO_2$

$FeCl_3 \cdot 6H_2O + 6CH_3 - C(OCH_3)_2 - CH_3 \rightarrow FeCl_3 + 12CH_3OH + 6CH_3COCH_3$

89. $P_4O_{10} + 6PCl_5 \rightarrow 10POCl_3$

90.(C) F has slightly less electron affinity than chlorine because F has very small atomic size (only two shells). Hence there is a tendency of electron-electron repulsion, which result in less evolution of energy in the formation of F^- ion. Assertion is correct but reason incorrect.