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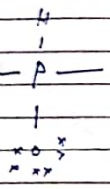
TOPIC :- Nitrogen Family.

Hypophosphorus acid :- Its Molecular formula is H_3PO_2. Oxidation no. of "P" in H_3PO_2 is +1. Although it has got three hydrogen atoms but only one among them is replaceable therefore it is MONOBASIC Acid. Its structure is represented as.



It is prepared as follows. Reaction of $Ba(OH)_2$ with white "P" gives Barium phosphate.

$$2P_4 + 3Ba(OH)_2 + 6H_2O \rightarrow 3Ba(H_2PO_2)_2 + 2PH_3$$

Barium phosphate on reaction with H_2SO_4 gives Hypophosphorus Acid H_3PO_2

$$Ba(H_2PO_2)_2 + H_2SO_4 \rightarrow BaSO_4 + 2H_3PO_2$$

(i) Hypophosphorus acid acts as a reducing agent.

$$H_3PO_2 + 2H_2O + 4\overset{+2}{Cu}Cl_2 \rightarrow H_3PO_4 + 2\overset{+1}{Cu_2}Cl_2 + 4HCl$$

In the above reaction Cu^{+2} is reduced to Cu^{+1} state.

(ii) H_3PO_2 reduces Hg^{+2} to Hg^{+1}

$$H_3PO_2 + 2H_2O + 4\overset{+2}{Hg}Cl_2 \rightarrow H_3PO_4 + 2\overset{+1}{Hg_2}Cl_2 + 4HCl$$

In the above reaction Hg^{+2} is reduced to Hg^{+1}

(iii) on heating it dissociates into PH_3

$$3H_3PO_2 \rightarrow PH_3 + 2H_3PO_3$$

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