



WEIRD CHEMIST

P-Block Elements

Oxyacids

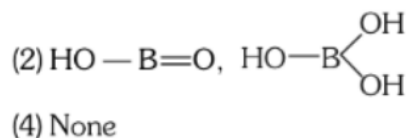
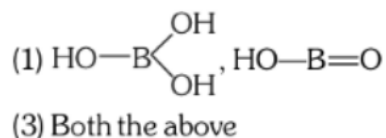
DPP – 04

Topic: Oxyacids of Boron, Phosphorus, Nitrogen, Sulphur & Halogens
Questions

Questions: 23
Exam: JEE / NEET

► TYPE 1 : Oxyacids of Boron

Q1. Structures of metaboric acid and orthoboric acid respectively are:



Q2. Orthoboric acid —

- | | |
|--|---|
| (1) Donates proton to form H_2BO_3^- | (3) Donates OH^- to form H_2BO_2^+ |
| (2) Accepts proton to form H_4BO_3^+ | (4) Accepts OH^- to form $[\text{B}(\text{OH})_4]^-$ |

Q3. Boric acid is an acid because its molecule

[NEET-II 2016]

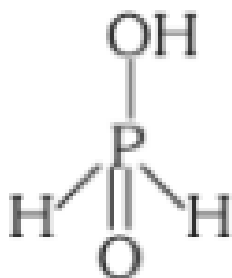
- (1) accepts OH^- from water releasing proton
- (2) combines with proton from water molecule
- (3) contains replaceable H^+ ion
- (4) gives up a proton

► TYPE 2 : Oxyacids of Phosphorus

Q4. Pick out the incorrect statement:

- (1) Orthophosphorus acid can be obtained by reacting P_4O_6 with H_2O
- (2) Orthophosphoric acid can be obtained by reacting P_4O_{10} with H_2O
- (3) Pyrophosphoric acid can be obtained by heating orthophosphorus acid
- (4) Metaphosphoric acid is obtained by the dehydration of orthophosphoric acid at 316°C

Q5. Hypophosphorus acid H_3PO_2 is —



- (1) Tribasic (2) Dibasic (3) Monobasic (4) Not acidic at all

Q6. The correct order of decreasing acid strength of oxyacids of Group-15 elements is:

- (1) $\text{HNO}_3 > \text{H}_3\text{SbO}_4 > \text{H}_3\text{AsO}_4 > \text{H}_3\text{PO}_4$ (3) $\text{HNO}_3 > \text{H}_3\text{PO}_4 > \text{H}_3\text{AsO}_4 > \text{H}_3\text{SbO}_4$
(2) $\text{H}_3\text{PO}_4 > \text{H}_3\text{AsO}_4 > \text{H}_3\text{SbO}_4 > \text{HNO}_3$ (4) $\text{HNO}_3 > \text{H}_3\text{AsO}_4 > \text{H}_3\text{PO}_4 > \text{H}_3\text{SbO}_4$

Q7. $2\text{P} \xrightarrow{-\text{H}_2\text{O}} \text{Q} \xrightarrow{-[\text{O}]} \text{R}$

If P is the parent phosphoric acid, then according to the given information the incorrect statement is

- (1) Q is pyro form and R is hypo form of the given parent oxy acid P
(2) Number of H-atoms present in each given oxy acid is equal to its basicity
(3) In P, Q, R oxy acids, oxidation state of central atom remains the same
(4) All given oxy acids have $p\pi-d\pi$ bond(s) in their structure

Q8. Oxidation states of P in $\text{H}_4\text{P}_2\text{O}_5$, $\text{H}_4\text{P}_2\text{O}_6$, $\text{H}_4\text{P}_2\text{O}_7$ are respectively:

- (1) +3, +4, +5 (3) +5, +3, +4
(2) +3, +5, +4 (4) +5, +4, +3

Q9. Which of the following statements is not valid for oxyacids of phosphorus? [AIPMT Pre. 2012]

- (1) All oxyacids contain tetrahedral four-coordinated phosphorus
(2) All oxyacids contain at least one $\text{P}=\text{O}$ unit and one $\text{P}-\text{OH}$ group
(3) Orthophosphoric acid is used in the manufacture of triple superphosphate
(4) Hypophosphorous acid is a diprotic acid

Q10. How many $\text{P}=\text{O}$ bonds are present in $(\text{HPO}_3)_3$?

[AIIMS 2012]

(1) 0

(2) 3

(3) 6

(4) 9

Q11. Strong reducing behaviour of H_3PO_2 is due to:

- (1) High oxidation state of phosphorus
- (2) Presence of two $-\text{OH}$ groups and one $\text{P}-\text{H}$ bond
- (3) Presence of one $-\text{OH}$ group and two $\text{P}-\text{H}$ bonds
- (4) High electron gain enthalpy of phosphorus

Q12. Lowest oxidation state of phosphorus is in

(1) H_3PO_2

(2) H_3PO_4

(3) $\text{H}_4\text{P}_2\text{O}_7$

(4) H_3PO_3

Q13. Which is the correct statement for the given acids?

- (1) Phosphinic acid is a diprotic acid while phosphonic acid is a monoprotic acid
- (2) Phosphinic acid is a monoprotic acid while phosphonic acid is a diprotic acid
- (3) Both are triprotic acids
- (4) Both are diprotic acids

► **TYPE 3 : Oxyacids of Nitrogen & Sulphur**

Q14. Which of the following oxyacids of sulphur contains a sulphur–sulphur single bond?

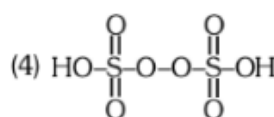
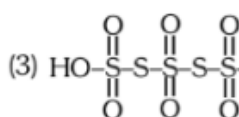
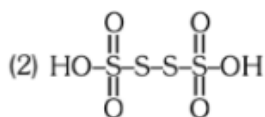
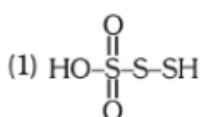
(1) $\text{H}_2\text{S}_2\text{O}_6$

(2) $\text{H}_2\text{S}_2\text{O}_7$

(3) $\text{H}_2\text{S}_2\text{O}_8$

(4) $\text{H}_2\text{S}_2\text{O}_3$

Q15. The structure of peroxodisulphuric acid is:



Q16. Number of $\text{S}-\text{S}$ bonds in $\text{H}_2\text{S}_n\text{O}_6$ is

(1) n

(2) $(n - 1)$

(3) $(n - 2)$

(4) $(n + 1)$

Q17. $\text{S}_2\text{O}_8^{2-}$ has:

- (1) $\text{S}-\text{S}$ bond
- (2) $\text{S}-\text{O}$ bridge

- (3) $\text{O}-\text{O}$ bridge
- (4) All $\text{S}-\text{O}$ bond lengths same

Q18. $\text{S}-\text{S}$ linkage is absent in

- (1) $\text{H}_2\text{S}_2\text{O}_7$ (2) $\text{H}_2\text{S}_2\text{O}_3$ (3) $\text{H}_2\text{S}_2\text{O}_5$ (4) $\text{H}_2\text{S}_2\text{O}_6$

► **TYPE 4 : Oxyacids of Halogens**

Q19. Which one of the following oxy acids of fluorine exists?

- (1) HOF (2) HFO_3 (3) HFO_4 (4) HFO_2

Q20. Which of the following statements is correct?

- (1) All form HOXO_3 type oxy acids
(2) Only chlorine and bromine form oxyacids
(3) All halogens form oxyacids
(4) Only iodine forms oxyacids

Q21. Consider the oxy acids HClO_n series where $n = 1$ to 4. The incorrect statement regarding these oxy acids is

- (1) Acidic character of oxy acids increases with increasing value of n
(2) Oxidising power of oxy acids increases with decreasing value of n
(3) Thermal stability of oxy acids decreases with increasing value of n
(4) Cl-O bond order decreases with decreasing value of n

Q22. Which halogen forms only one oxyacid (HOX)?

- (1) F (2) Br (3) I (4) Cl

Q23. Among the following, the correct order of acidity is

[NEET-I 2016]

- (1) $\text{HClO}_3 < \text{HClO}_4 < \text{HClO}_2 < \text{HClO}$
(2) $\text{HClO} < \text{HClO}_2 < \text{HClO}_3 < \text{HClO}_4$
(3) $\text{HClO}_2 < \text{HClO} < \text{HClO}_3 < \text{HClO}_4$
(4) $\text{HClO}_4 < \text{HClO}_2 < \text{HClO} < \text{HClO}_3$