

QB365

Important Questions - The p-Block Elements

12th Standard CBSE

Chemistry

Reg.No. :

--	--	--	--	--	--

Time : 01:00:00 Hrs

Total Marks : 50

Section - A

- 1) Which of the following statement is wrong? 1
- (a) Single N-N bond is stronger than the single P-P bond
(b) PH_3 can act as a ligand in the formation of coordination compound with transition elements.
(c) NO_2 is paramagnetic in nature. (d) Covalency of nitrogen in N_2O_5 is four.
- 2) The oxidation state of central atom in the anion of compound NaH_2PO_2 will be 1
- (a) +3 (b) +5 (c) +1 (d) -3
- 3) Which of the following options are not in accordance with the property mentioned against them? 1
- (a) $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$ Oxidising power (b) $\text{MI} > \text{MBr} > \text{MCl} > \text{MF}$ Ionic character of metal halide
(c) $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$ Bond dissociation enthalpy (d) $\text{HI} < \text{HBr} < \text{HCl} < \text{HF}$ Hydrogen-halogen bond strength.
- 4) Which of the following statements are correct? 1
- (a) S-S bond is present in $\text{H}_2\text{S}_2\text{O}_6$ (b) In peroxosulphuric acid (H_2SO_5) sulphur is in +6 oxidation state.
(c) Iron powder along with Al_2O_3 and K_2O is used as a catalyst in the preparation of NH_3 by Haber's process.
(d) Changes in enthalpy is positive for the preparation of SO_3 by catalytic oxidation of SO_2
- 5) The correct order of the acidic nature of oxides is in the order 1
- (a) $\text{NO} < \text{N}_2\text{O} < \text{N}_2\text{O}_3 < \text{NO}_2 < \text{N}_2\text{O}_5$ (b) $\text{N}_2\text{O} < \text{NO} < \text{N}_2\text{O}_3 < \text{NO}_2 < \text{N}_2\text{O}_5$ (c) $\text{N}_2\text{O}_5 < \text{NO}_2 < \text{N}_2\text{O}_3 < \text{NO} < \text{N}_2\text{O}$
(d) $\text{N}_2\text{O}_5 < \text{N}_2\text{O}_3 < \text{NO}_2 < \text{NO} < \text{N}_2\text{O}$
- 6) Mn_2O_7 (1) Acidic oxide 1
- 7) NH_4^+ (2) Tetrahedral 1
- 8) Helium (3) Cryogenic 1
- 9) $\text{PbO}_2 + \text{H}_2\text{SO}_4 \xrightarrow{?} \text{PbSO}_4 + \text{O}_2$ (4) Warm 1
- 10) $\text{Na}_2\text{S}_2\text{O}_3 + \text{H}_2\text{O} \xrightarrow{?} \text{NaHSO}_4$ (5) Cl_2 1

Section - B

- 11) Write the conditions to maximise the yield of H_2SO_4 by Contact process. 2
- 12) Explain the following observations: (i) Bismuth oxide is not acidic in any of its reactions. (ii) HF is a weaker acid than HI in aqueous solutions. 2
- 13) Complete the following chemical reaction equations: (i) $\text{Xe}(\text{g}) + \text{F}_2(\text{g}) \xrightarrow[\text{(in excess)}]{873 \text{ K}} \text{F}_2(\text{g})$ (ii) $\text{Li} + \text{N}_2 \xrightarrow{7\text{bar}}$ 2

- 14) Name three oxoacids of nitrogen. Write the disproportionation reaction of that oxoacid of nitrogen in which nitrogen is in +3 oxidation state. 2
- 15) Phosphorus forms a number of oxoacids. Out of these oxoacids phosphinic acid has strong reducing property. Write its structure and also write a reaction showing its reducing behaviour. 2

Section - C

- 16) Write balanced chemical equation for the following reactions: (i) Chlorine is passed through hot concentrated NaOH solution. (ii) XeF_6 is hydrolysed. (iii) Excess of SO_2 reacts with sodium hydroxide solution. 3
- 17) Give reasons for each of the following: (a) Sulphur in vapour state exhibits paramagnetic behaviour. (b) Hydrogen fluoride is weaker acid than hydrogen chloride in water. (c) NH_3 has higher proton affinity than PH_3 . 3
- 18) Describe the following about halogen family (group 17 elements): (i) Relative oxidising power (ii) Relative strength of their hydrides (iii) Oxyacids and their related oxidising ability. 3
- 19) Mention three areas in which H_2SO_4 plays an important role. 3
- 20) White phosphorus reacts with chlorine and the product hydrolyses in the presence of water. Calculate the mass of HCl obtained by the hydrolysis of the product formed by the reaction of 62g of white phosphorus with chlorine in the presence of water. 3

Section - D

- 21) (a) Complete the following reaction equations: 5
- (i) $\text{PCl}_5 + \text{H}_2\text{O} (\text{excess}) \rightarrow$
- (ii) $\text{F}_2 + \text{H}_2\text{O} \rightarrow$
- (b) Explain the following observations:
- (i) No distinct chemical compound of helium is known.
- (ii) Phosphorus has a greater tendency for catenation than nitrogen.
- (iii) In solution of H_2SO_4 in water, the second dissociation constant K_{a_2} , is less than the first dissociation constant K_{a_1} .
- 22) (a) Account for the following: 5
- (i) The acidic strength decreases in the order $\text{HCl} > \text{H}_2\text{S} > \text{PH}_3$
- (ii) Tendency to form pentahalides decreases down the group in group 15 of the periodic table.
- (b) Complete the following chemical equations:
- (i) $\text{P}_4 + \text{SO}_2\text{Cl}_2 \rightarrow$
- (ii) $\text{XeF}_2 + \text{H}_2\text{O} \rightarrow$
- (iii) $\text{I}_2 + \text{HNO}_3 (\text{conc.}) \rightarrow$
- 23) On heating compound (A) gives a gas (B) which is a constituent of air. This gas when treated with 3 mol of hydrogen (H_2) in the presence of a catalyst gives another gas (C) which is basic in nature. Gas C on further oxidation in moist condition gives a compound (D) which is a part of acid rain. Identify compound (A) to (D) and also give necessary equations of all the steps involved. 5
