

UNIT-7

p- BLOCK ELEMENTS

1 Mark Questions

1. Which amongst the following is the strongest oxidizing agent?



2. A student wanted to draw his school building on a glass sheet, which acid he should use?

3. Nitrogen and P give negative ions, while As, Sb and Bi do not. Why?

4. Sea weeds are the sources of which halogen?

5. When NaBr is heated with conc H_2SO_4 , Br_2 is produced but when NaCl is heated with conc H_2SO_4 , HCl is produced. Why?

6. Which oxo-acid of Phosphorus contains P-P linkage?

7. Out of HClO_3 and HClO_4 , which has lower Pka value and why?

8. Name the acidic hydride of N_2 ?

9. State the difference between the nature of Pi bonds in H_3PO_3 and HNO_3 molecules?

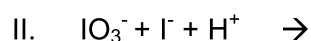
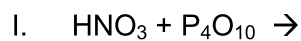
10. Name the gas liberated when Ammonium Nitrate is strongly heated.

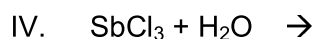
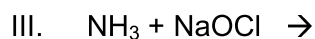
11. Give one disproportionation reaction of H_3PO_3 .

2 Mark Questions

12. Oxides of Nitrogen have open chain structure, while those of Phosphorous have closed chain or cage structures. Why is it so?

13. Complete the following :





14. Calculate the amount of 0.1 M NaOH solution required to neutralize the solution produced by dissolving 1.1 g of P_4O_6 in water.
15. Explain giving reason. Nitrogen exists as a diatomic molecule whereas Phosphorous exists as tetra atomic molecule.
16. Name the hydrogen halide which is liquid at room temperature and why?
17. Which oxide of sulphur is capable of acting as oxidizing as well as reducing agent? Why?
18. $(\text{SiH}_3)_3\text{N}$ is a weaker base than $(\text{CH}_3)_3\text{N}$. Give reason.
19. CN^- ion is known but CP^- not known. Give reason.
20. Explain giving reason. NF_3 is an exothermic compound but NCl_3 is an endothermic compound.
21. Which halogen will produce O_2 and O_3 as passed through water?
22. Nitrogen forms a large no. of oxides than Phosphorous. Explain.

3 marks question

23. Account for the following

- I. Chlorine water has both oxidizing and bleaching properties.
- II. H_3PO_2 and H_3PO_3 act as good reducing agents while H_3PO_4 doesn't.

24. An organic compound A gives a brick red flame on performing flame test. The compound gives the following tests also

- I. It gives smell of chlorine when placed in moist air.
- II. If KI and CH_3COOH are added to the solution of the compound a violet colour is observed.

Identify the compound and write the chemical reactions for the steps (I) and (II).

25. Give reasons for each of the following observations

- I. Only higher members of the group 18 of the periodic table are expected to form compounds.
- II. NO_2 readily forms a dimer whereas ClO_2 doesn't.

26. Give reasons for the following observations

- I. SF_6 is used as gaseous electrical insulators.
- II. S exhibit greater tendency for catenation than selenium.
- III. The electron gain enthalpy value of F_2 is less negative than chlorine.

27. Bleaching of flowers by Cl_2 is permanent, by SO_2 it is temporary. Explain?

28. Hydrogen halides are covalent compounds but their aqueous solutions can conduct electric current. Explain.

29. Which of the halogens (except At)

- I. Forms the weakest acid?
- II. Has the largest atom?
- III. Has the minimum ionization enthalpy?
- IV. Has the maximum electron affinity?

30. Knowing the electron gain enthalpy values for $\text{O} \rightarrow \text{O}^-$ and $\text{O} \rightarrow \text{O}^{2-}$ as

-141 KJ/mol and 702 KJ/mol respectively, how can you account for the formation of a large no. of oxides having O^{2-} species and not O^- (clue: Lattice Enthalpy).

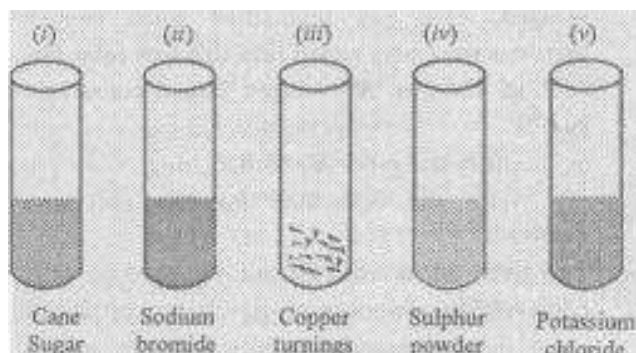
31. What happens when SO_2 is passed through an aq. Solution of Fe (III) salt. Give equation.

5 Marks Question

32. An element 'A' exists as a yellow solid in standard state. It forms a volatile hydride 'B' which is a foul smelling gas and is extensively used in qualitative analysis of salts.

When treated with oxygen, 'B' forms an oxide 'C' which is colourless, pungent smelling gas. This gas when passed through acidified KMnO_4 solution, decolourizes it. 'C' gets oxidized to another oxide 'D' in the presence of a Heterogeneous catalyst. Identify A, B, C, D and also give the chemical equation of reaction of 'C' with acidified KMnO_4 solution and for conversion of 'C' to 'D'.

33. Concentrated sulphuric acid is added followed by heating to each of the following test tubes labelled (i) to (v)



Identify in which of the above test tube the following change will be observed. Support your answer with the help of a chemical equation.

- (a) Formation of black substance
 - (b) Evolution of brown gas
 - (c) Evolution of colourless gas
 - (d) Formation of brown substance which on dilution becomes blue
 - (e) Disappearance of yellow powder along with evolution of colourless gas.
34. When conc. sulphuric acid was added to an unknown salt present in a test tube, a brown gas (A) was evolved. This gas intensified when copper turnings were also added into this tube. On cooling, the gas 'A' changed into a colourless gas 'B'.

- (a) Identify the gases A and B.
- (b) Write the equations for the reactions involved.

35. A translucent white waxy solid 'A' on heating in an inert atmosphere is converted into its allotropic form (B). Allotrope 'A' on reaction with very dilute aqueous KOH liberates a highly poisonous gas 'C' having rotten fish smell. With excess of chlorine 'A' forms 'D' which hydrolyses to compound 'E'. Identify compounds 'A' to 'E'.
36. A colourless inorganic salt (A) decomposes completely at about 25°C to give only two products, (B) and (C), leaving no residue. The oxide (C) is a liquid at room temperature and neutral to moist litmus paper while the gas (B) is a neutral oxide. White phosphorus burns in excess of (B) to produce a strong white dehydrating agent. Write balanced equations for the reactions involved in the above process.

Gradual addition of KI to $\text{Bi}(\text{NO}_3)_3$ solution initially produces a dark brown precipitate which dissolves in excess of KI to give a clear yellow solution. Write chemical equations for the a