

THE GURUKUL INSTITUTE

PLOT 5C, 2ND FLOOR, GANAPATI COMPLEX, SEC-13, OPP. JAIPURIA
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P- BLOCK ELEMENTS

1. In solid state PCl_5 behaves as an ionic species. Give reason?
2. Draw the structure of XeF_2 molecule.
3. Complete the following equation:
 $\text{XeF}_2 + \text{H}_2\text{O} \rightarrow$
4. Write one chemical reaction to show that chlorine gas can be obtained from bleaching powder.
5. Give chemical evidence for the following:
Fluorine is a stronger oxidizing agent than chlorine.
6. What type of hybridization is associated with N in NH_3 ?
7. Which is the strongest oxidizing agent among ClO_4^- , BrO_4^- and IO_3^- ?
8. Name one ion whose central atom has the sp^3d^3 type of hybrid orbitals.
9. Why is bond dissociation energy of fluorine molecule less than that of chlorine molecule?
10. Account for the following:
Tendency to show -2 oxidation state diminishes from sulphur to polonium in group 16.
11. Why is hydrogen sulphide, with greater molar mass, a gas, while water a liquid at room temperature?
12. Noble gases are mostly frequent chemically inert. Give reason.
13. Complete and balance the equation:
 $\text{BrO}_3^- + \text{F}_2 + \text{OH}^- \rightarrow \dots$
14. Nitrogen and phosphorus are element in the same group but property of catenation is shown only by phosphorus, why?
15. Fluorine provides the largest variety of interhalogen compounds amongst halogens, why?
16. Which has the larger bond angle H_2S or H_2O and why?
17. Why fluorine and oxygen compounds are more aptly called oxygen fluoride?
18. Why is HF the weakest acid among hydrohalo-acids in spite of the fact that fluorine is most electronegative?
19. Which of the two is more covalent SbCl_3 or SbCl_5 ?
20. Why do noble gases form compounds with fluorine and oxygen only?
21. Draw the structure of XeF_4 .
22. Write the structures of the following species:
a. H_3PO_2 b. H_2SO_5 c. IF_5 d. XeO_3
23. How would you account for the following?
 - a. Hydrogen fluoride is much less volatile than hydrogen fluoride.
 - b. Interhalogen compounds are strong oxidizing agents.
 - c. Sulphur hexafluoride is less reactive than sulphur tetra fluoride.
 - d. Of the noble gases only xenon forms known chemical compounds.
 - e. Nitric oxide becomes brown when released in air.
 - f. PCl_5 is ionic in nature in the solid state.
 - g. Ammonia acts as a ligand.
 - h. Sulphur disappears when boiled with an aqueous solution of sodium sulphite.
24. Thermal stability of water is much higher than that of H_2S . Give reason?
25. What happens when :
 - a) Chlorine is passed through a hot concentrated solution of an alkali like $\text{Ba}(\text{OH})_2$?
 - b) XeF_4 undergoes hydrolysis?
26. SF_6 is not easily hydrolyzed, why?
27. Assign reasons:
 - a. More metals fluorides are ionic in nature than metal chlorides.

- b. SCl_6 is not known but SF_6 is known.
28. Give reasons :
- Bleaching of flowers by Cl_2 is permanent, while that by SO_2 is temporary.
 - Nitric oxide becomes brown when released in air.
29. Draw the structures of the following:
- Peroxodisulphuric acid
 - Bromine trifluoride.
30. Give the chemical reactions in support of your answer:
- The +5 oxidation state of Bi is less stable than its +3 state.
 - Sulphur exhibits greater tendency for catenation than selenium.
31. Apply VSEPR theory to deduce the structures of XeF_6 and XeF_4 .
32. Compare giving reasons, the oxidizing power of chlorine and fluorine.
33. Phosphorous (Z=15) and Vanadium (Z=23) exhibits variable oxidation states for different reasons. Explain the difference.
34. Write the balanced equations for the following reactions:
 $\text{NH}_3 + \text{NaOCl} \rightarrow$
 $\text{XeF}_6 + \text{KF} \rightarrow$
35. Give reasons :
- Sulphur in vapor state exhibits paramagnetic behavior.
 - Hydrogen fluoride is weaker acid than hydrogen chloride in water.
 - NH_3 has higher proton affinity than PH_3 .
36. Neon is not known to form compounds.
37. Out of HI and HCl, which has weaker covalent bond and what effect has it on their acid strengths?
38. NaOCl solution becomes unstable on warming. What happens to it?
39. Assign reasons for the following:
- The acid strengths of acids increase in the order $\text{HF} < \text{HCl} < \text{HBr} < \text{HI}$
 - H_3PO_2 behaves as a monoprotic acid.
40. With the help of chemical equations, explain in brief the principle of contact process for the manufacture of sulphuric acid.
41. How are the following isolated from their compounds?
Phosphorus from calcium phosphate.
- 42.

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