

Unit: 7- The p –Block Elements (8 marks)

I. Account for the following

1. Ammonia has higher boiling point than Phosphine.
2. Bi(V) is a strong oxidizing agent than Sb (V)
3. + 3 oxidation state becomes more and more stable from As to Bi in the group
4. The stability of +3 state increases down the group in group 15 of the periodic table.
5. The +5 oxidation state becomes less stable down the group 15 of the periodic table
6. Phosphorus shows greater tendency for catenation than Nitrogen.
7. Phosphorous, P₄ is much more reactive than Nitrogen N₂
8. All the bonds in the molecules of PCl₅ are not equal.
9. NH₃ is stronger base than PH₃.
10. PH₃ is weaker base than NH₃
11. PH₃ forms bubbles when passed slowly in water but NH₃ dissolves.
12. Nitrogen does not form pentahalides.
13. Tendency to form pentahalides decreases down the group in group 15 of the periodic table
14. In solid state PCl₅ exists as ionic compound.
15. PCl₄⁺ is likely to exist but PCl₄⁻ is likely not to exist.
16. NH₃ act as ligand. (Lewis base)
17. Ammonia(NH₃) has greater affinity for protons than phosphine PH₃
18. In the structure of HNO₃, the N-O bond (121pm) is shorter than N-OH bond(140pm)
19. The N – O bond in NO₂⁻ is shorter than the N – O bond in NO₃⁻
20. NCl₃ is an endothermic compound while NF₃ is an exothermic one
21. Red phosphorous is less reactive than white Phosphorous
22. CN⁻ ion is known but CP⁻ ion is not known.
23. H₃PO₂ and H₃PO₃ act as good reducing agents while H₃PO₄ does not.
24. NO₂ is coloured but N₂O₄ is colourless.
25. NO₂ dimerises to form N₂O₄
26. Nitric oxide becomes brown when released in air.
27. Nitric oxide is paramagnetic in gaseous state but the solid obtained on cooling it is diamagnetic
28. Bond angle in PH₄⁺ is higher than that in PH₃
29. Pentahalides of group 15 are more Covalent than trihalides
30. The first ionization energy of nitrogen is greater than oxygen.
31. H₃PO₃ is diprotic acid.
32. Nitrogen exists as diatomic molecule and phosphorus as P₄.
33. NH₃ is basic while BiH₃ is only feebly basic
34. PF₅ is known while NF₅ is not known.
35. Sulphur vapours exhibits paramagnetism.
36. In solution of sulphuric acid in water the K_{a2} << K_{a1}.
37. Sulphur shows greater tendency for catenation than selenium
38. Sulphur has greater tendency for catenation than oxygen.
39. H₂O is a liquid while H₂S is a gas
40. H₂S is less acidic than H₂Te.
41. The negative value of electron gain enthalpy of oxygen atom is less than that of sulphur
42. SF₆ is much less reactive than SF₄
43. All the bonds in the molecules of SF₄ are not equal
44. SF₆ is kinetically an inert substance.
45. H₂S is more acidic than H₂O.

46. OF₆ is not known.
47. SF₄ is easily hydrolysed, SF₆ is not easily hydrolysed
48. OF₂ should be called oxygen fluoride and not fluorine oxide
49. Dioxygen is a gas but Sulphur is a solid
50. Oxygen molecule has formula O₂ while Sulphur S₈
51. Oxygen generally exhibit oxidation state of -2 only whereas other members of the family exhibit +2, +4, +6 oxidation states also.
52. H₂S acts as only reducing agent but SO₂ acts as a reducing as well as an oxidizing agent.
53. In spite of similar electronegativity, oxygen forms hydrogen bonding while chlorine does not.
54. The increasing order of acidic strength of HX varies in the order H₂O < H₂S < H₂Se < H₂Te.
55. SCl₆ is not known but SF₆ is known.
56. Ozone (O₃) act as a powerful oxidising agent.
57. Ozone is thermodynamically less stable than oxygen.
58. Fluorine does not exhibit any positive oxidation state.
59. F₂ is most reactive of all the four common halogens
60. F₂ is a stronger oxidising agent than Cl₂
61. O₂ & F₂ both stabilize higher oxidation states of metals but O₂ exceeds F₂ in doing so.
62. When HCl reacts with finely powdered iron, it forms ferrous chloride and not ferric chloride.
63. HF has higher boiling point than HCl.
64. ICl is more reactive than Cl₂.
65. Bond dissociation energy of F₂ is less than Cl₂
66. HI in aqueous solution is strong acid than HF.
67. The negative value of electron gain enthalpy of fluorine is less than that of Chlorine.
68. Fluorine never acts as the central atom in the polyatomic interhalogen compounds
69. ClF₃ molecule has a T-shaped structure and not a trigonal planar one.
70. Fluorine forms the largest number of interhalogen compounds among halogens.
71. Halogens are coloured
72. F shows oxidation state of -1 only whereas other halogens exhibit +1, +3, +5, +7 Ox. states also.
73. ClF₃ exists but FCl₃ does not.
74. Halogens are strong oxidizing agent
75. Most of the reactions of fluorine are exothermic
76. Fluorine forms only one oxoacid, HOF.
77. The acidic strength of oxoacids of halogens varies in the order HOF > HOCl > HOBr > HOI.
78. The acidic strength of oxoacids of halogens varies in the order: HClO₄ > HClO₃ > HClO₂ > HClO
79. Chlorine is a powerful bleaching agent
80. Metal fluorides are more ionic than its chlorides.
81. Perchloric acid is stronger than sulphuric acid
82. The acidic strength decreases in the order HCl > H₂S > PH₃
83. Helium is used in diving apparatus
84. XeF₂ has a linear structure & not a bent angular structure
85. Of the noble gases only Xenon is known to form real chemical compounds
86. No Chemical compound of helium is known.
87. Xe does not forms compounds such as XeF₃ and XeF₅
88. Helium is used for inflating aeroplane tyres.
89. Noble gases are mostly chemically inert.
90. Structures of Xenon Fluorides cannot be explained on the basis of valence bond approach.