

p-Block Elements

JEE (Main) Exercises

Single Correct Answer Type

- Which is true for an element present in group 13 of the periodic table?
 - It is gas at room temperature
 - It has oxidation state of 4+
 - It forms R_2O_3
 - It forms RX_2
- Borax is prepared by treating colemanite with:
 - $NaNO_3$
 - $NaCl$
 - $NaHCO_3$
 - Na_2CO_3
- On the addition of mineral acid to an aqueous solution of borax, the following compound is formed:
 - Boron hydride
 - Ortho-boric acid
 - Meta-boric acid
 - Pyro-boric acid
- Three centered bond is present in:
 - NH_3
 - B_2H_6
 - BCl_3
 - $AlCl_3$
- Boron compounds behave as Lewis acids because of their:
 - Acidic nature
 - Covalent nature
 - Ionic nature
 - Vacant orbital
- Which of the following is not a Lewis acid?
 - SiF_4
 - $FeCl_3$
 - BF_3
 - C_2H_4
- $AlCl_3$ on hydrolysis gives:
 - $Al_2O_3 \cdot H_2O$
 - $Al(OH)_3$
 - Al_2O_3
 - $AlCl_3 \cdot 6H_2O$
- Thallium shows different oxidation states because:
 - Of its high reactivity
 - Of inert pair of electrons
 - Of its amphoteric nature
 - It is a transition metal
- H_3BO_3 is:
 - Monobasic and weak Lewis acid
 - Monobasic and weak Bronsted acid
 - Monobasic acid and strong Lewis acid
 - Tribasic acid and weak Bronsted acid
- Which of the following compound is known as inorganic benzene?
 - B_6H_6
 - C_5H_5B
 - $C_3N_3H_3$
 - $B_3N_3H_6$
- The structure and hybridization of $Si(CH_3)_4$ are:
 - Bent, sp
 - Trigonal, sp^2
 - Octahedral, sp^3d^2
 - Tetrahedral, sp^3
- Which of the following is not hydrolyzed?
 - CCl_4
 - $SiCl_4$
 - $SnCl_4$
 - $PbCl_4$
- Which of the following halides is least stable and has doubtful existence?
 - Cl_4
 - SnI_4
 - GeI_4
 - PbI_4
- The number and type of bonds between two carbon atoms in CaC_2 are:
 - One sigma and one pi bond
 - One sigma and two pi bonds

- (c) One sigma and one and a half pi bond
(d) One sigma bond
15. The material used in solar cells contains:
(a) Si (b) Sn
(c) Ti (d) Cs
16. Which of the following is correct composition of water gas?
(a) CO + Cl₂ (b) CO + N₂
(c) CO + H₂ (d) CO + H₂ + N₂
17. What is the formula for carbon suboxide?
(a) CO (b) CO₂
(c) C₂O₄ (d) C₃O₂
18. Percentage of lead in lead pencil is:
(a) Zero (b) 20
(c) 80 (d) 70
19. CCl₄ is used as fire extinguisher because:
(a) Its m.pt. is high (b) It forms covalent bond
(c) Its b.pt. is low
(d) It gives incombustible vapors
20. Marsh gas contains:
(a) CH₄ (b) CO₂
(c) C₂H₆ (d) N₂
21. Which of the following is most stable?
(a) Sn²⁺ (b) Ge²⁺
(c) Si²⁺ (d) Pb²⁺
22. Carborundum is:
(a) Al₂O₃ (b) SiC
(c) BF₃ (d) B₄C
23. The acid which contains a peroxo linkage is:
(a) Sulphurous acid (b) Pyrosulphuric acid
(c) Dithionic acid (d) Caro's acid
24. Graphite is a soft solid lubricant extremely difficult to melt. The reason for this anomalous behavior is that graphite:
(a) Has molecules of variable molecular masses like polymers
(b) Has carbon atoms arranged in large plates of rings of strongly bonded carbon atoms with weak interplate bonds
(c) Is a non-crystalline substance
(d) Is an allotropic form of diamond
25. In SiF₆²⁻ and SiCl₆²⁻, which one is known and why?
(a) SiF₆²⁻ because of small size of F
(b) SiF₆²⁻ because of large size of F
(c) SiF₆²⁻ because of small size of Cl
(d) SiF₆²⁻ because of large size of Cl
26. Which is likely to show inert pair effect?
(a) K (b) Mg
(c) Al (d) Pb
27. The stability of dihalides of Si, Ge, Sn, and Pb increases steadily in the sequence:
(a) PbX₂ < SnX₂ < GeX₂ < SiX₂
(b) GeX₂ < SiX₂ < SnX₂ < PbX₂
(c) SiX₂ < GeX₂ < PbX₂ < SnX₂
(d) SiX₂ < GeX₂ < SnX₂ < PbX₂
28. Diamond is hard because:
(a) All the four valence electrons are bonded to each carbon atoms by covalent bonds
(b) It is a small molecule
(c) It is made up of carbon atoms
(d) It cannot be burnt
29. Products formed when Pb(NO₃)₂ is heated are:
(a) PbO, N₂, O₂ (b) Pb(NO₂)₂, O₂
(c) PbO, NO₂, O₂ (d) Pb, N₂, O₂
30. Which one of the following pairs is obtained on heating ammonium dichromate?
(a) N₂ and H₂O (b) H₂O and H₂O
(c) NO₂ and H₂O (d) NO and NO₂
31. Silver chloride dissolves in excess of NH₄OH. The cation present in solution is:
(a) Ag⁺ (b) [Ag(NH₃)₄]⁺
(c) [Ag(NH₃)₂]⁺ (d) [Ag(NH₃)₆]⁺
32. The catalyst used in the manufacture of ammonia by Haber's process is:
(a) Pt (b) Fe
(c) Mo (d) V₂O₅
33. Industrial preparation of nitric acid by Ostwald's process involves:
(a) Oxidation of NH₃
(b) Reduction of NH₃
(c) Hydrogenation of NH₃
(d) hydrolysis of NH₃
34. White phosphorus reacts with caustic soda. The products are PH₃ and NaH₂PO₂. This reaction is an example of:
(a) Oxidation (b) Reduction
(c) Neutralization (d) Disproportionation
35. Which one of the following is the strongest base?
(a) AsH₃ (b) SbH₃
(c) PH₃ (d) NH₃

36. When zinc reacts with very dilute nitric acid it produces:
 (a) NH_4NO_3 (b) NO
 (c) NO_2 (d) H_2
37. Nitrogen molecule is chemically less active because of its:
 (a) small atomic energy
 (b) high dissociation energy
 (c) high electronegativity
 (d) stable electronic configuration
38. Which of the following oxides of nitrogen is the anhydride of nitrous acid?
 (a) NO (b) N_2O_3
 (c) N_2O_4 (d) N_2O_5
39. Which of the following fluorides does not exist?
 (a) NF_5 (b) PF_5
 (c) AsF_5 (d) SbF_5
40. When ammonia is passed over heated CuO, it is oxidized to:
 (a) HNO_2 (b) N_2O
 (c) N_2 (d) NO_2
41. The CN^- ion and N_2 are isoelectronic. But in contrast to CN^- , N_2 is chemically inert because of:
 (a) Low bond energy
 (b) Absence of bond polarity
 (c) Unsymmetrical electron distribution
 (d) Presence of more number of electrons in bonding orbitals
42. Which oxide does not act as a reducing agent?
 (a) NO (b) NO_2
 (c) N_2O (d) N_2O_5
43. When AgNO_3 is heated strongly, the products formed are:
 (a) NO and NO_2 (b) NO_2 and N_2O
 (c) NO_2 and O_2 (d) NO and O_2
44. Aqueous solution of ammonia consists of:
 (a) H^+ only (b) OH^- only
 (c) NH_4^+ only (d) NH_4^+ and OH^-
45. Which of the following species is paramagnetic?
 (a) O_2^{2-} (b) NO
 (c) CO (d) CN
46. The BCl_3 is a planar molecule, whereas NCl_3 is pyramidal because:
 (a) N—Cl bond is more covalent than B—Cl bond
 (b) B—Cl bond is more polar than N—Cl bond
 (c) Nitrogen atom is smaller than boron
 (d) BCl_3 has no lone pair but NCl_3 has a lone pair of electron
47. The hybridization of atomic orbitals of nitrogen in NO_2^+ , NO_3^- and NH_4^+ are:
 (a) sp , sp^3 and sp^2 respectively
 (b) sp , sp^2 and sp^3 respectively
 (c) sp^2 , sp and sp^3 respectively
 (d) sp^2 , sp^3 and sp respectively
48. In which of the following the bond angle is maximum?
 (a) NH_3 (b) NH_4^+
 (c) PCl_3 (d) SCl_2
49. The hybridization state of the central atom in PCl_5 is:
 (a) sp^3d (b) sp^3d^2
 (c) sp^3 (d) d^2sp^3
50. Cl—P—Cl bond angles in PCl_5 molecule are:
 (a) 120° and 90° (b) 60° and 90°
 (c) 60° and 120° (d) 120° and 30°
51. Phosphine acetylene and ammonia can be formed by treating water with:
 (a) Mg_3P_2 , Al_4C_3 , Li_3N
 (b) Ca_3P_2 , CaC_2 , Mg_3N_2
 (c) Ca_3P_2 , CaC_2 , CaCN_2
 (d) Ca_3P_2 , Mg_2C , NH_4NO_3
52. The shape of PCl_3 molecule is:
 (a) Trigonal bipyramidal (b) Tetrahedral
 (c) Pyramidal (d) Square planar
53. Atoms in P_4 molecule of white phosphorus are arranged regularly in the following way:
 (a) At the corners of a cube
 (b) At the corners of an octahedron
 (c) At the corners of a tetrahedron
 (d) At the center and corners of a tetrahedron
54. Correct order of bond angles for the following is:
 (a) $\text{NH}_3 > \text{PCl}_3 > \text{BCl}_3$ (b) $\text{BCl}_3 > \text{CH}_4 > \text{PCl}_3$
 (c) $\text{BCl}_3 > \text{PCl}_3 > \text{NH}_3$ (d) $\text{PCl}_3 > \text{BCl}_3 > \text{NH}_3$
55. The reaction of elemental P_4 in aqueous NaOH gives:
 (a) PH_3 , NaH_2PO_2 (b) PH_3 , Na_3PO_4
 (c) NaH_2PO_4 , Na_3PO_4 (d) Na_3P , Na_3PO_4
56. Which of the following oxides is amphoteric in character?
 (a) CaO (b) CO_2
 (c) SiO_2 (d) SnO_2
57. The geometry of H_2S and its dipole moment are:
 (a) Angular and non-zero (b) Angular and zero
 (c) Linear and zero (d) Linear and non-zero

58. The oxidation number of sulphur in S_8 , S_2F_2 , H_2S respectively, are:
 (a) 0, +1 and -2 (b) +2, +1 and -2
 (c) 0, +1 and +2 (d) -2, +1 and -2
59. Which of the following has $p_\pi - d_\pi$ bonding?
 (a) NO_3^- (b) SO_3^{2-}
 (c) BO_3^{3-} (d) CO_3^{2-}
60. In the species O_2 , O_2^+ , O_2^- and O_2^{2-} , the correct decreasing order of bond strength is:
 (a) $O_2 > O_2^+ > O_2^- > O_2^{2-}$
 (b) $O_2^+ > O_2 > O_2^- > O_2^{2-}$
 (c) $O_2^{2-} > O_2^- > O_2^+ > O_2$
 (d) $O_2^- > O_2^{2-} > O_2 > O_2^+$
61. The correct order of O—O bond length in O_2 , H_2O_2 and O_3 is:
 (a) $O_3 > H_2O_2 > O_2$ (b) $O_2 > H_2O_2 > O_3$
 (c) $O_2 > O_3 > H_2O_2$ (d) $H_2O_2 > O_3 > O_2$
62. Oxidizing action increases in the following order:
 (a) $Cl < Br < I < F$ (b) $Cl < I < Br < F$
 (c) $I < F < Cl < Br$ (d) $I < Br < Cl < F$
63. Which of the following statements is correct for $CsBr_3$?
 (a) It is a covalent compound
 (b) It contains Cs^{3+} and Br^- ions
 (c) It contains Cs^+ and Br_3^- ions
 (d) It contains Cs^+ , Br^- and lattice Br_2 molecule
64. When iodine is dissolved in CCl_4 , the color that results is:
 (a) Brown (b) Bluish green
 (c) Violet (d) Colorless
65. Hydrogen bonding does not play any role in the boiling point of:
 (a) NH_3 (b) H_2O
 (c) HI (d) HF
66. The following acids have been arranged in order of decreasing acid strength. Identify the correct order:
 $ClOH(I)$ $BrOH(II)$ $IOH(III)$
 (a) $I > II > III$ (b) $II > I > III$
 (c) $III > II > I$ (d) $I > III > II$
67. Hydrogen fluoride is a liquid unlike other hydrogen halides because:
 (a) H—F bond is strong
 (b) F-atom is small in size
 (c) Hydrogen bonding is present
 (d) HF is a weak acid
68. Which of the following possesses the highest bond energy?
 (a) F_2 (b) Cl_2
 (c) Br_2 (d) I_2
69. Order of boiling point is:
 (a) $HF > HI > HBr > HCl$
 (b) $HF > HBr > HI > HCl$
 (c) $HCl > HBr > HI > HF$
 (d) $HCl > HI > HBr > HF$
70. Which of the following is a pseudohalogen?
 (a) IF_7 (b) CN^-
 (c) ICl_2 (d) I_3^-
71. Which of the following is the strongest acid?
 (a) HBr (b) HF
 (c) H_2S (d) PH_3
72. Which is formed when $K_2Cr_2O_7$, $CaCl_2$, and conc H_2SO_4 are heated?
 (a) $Cr_2(SO_4)_3$ (b) $CrCl_3$
 (c) CrO_2Cl_2 (d) K_2CrO_4
73. On heating $KClO_3$ we get:
 (a) $KClO_2 + O_2$ (b) $KCl + O_2$
 (c) $KCl + O_3$ (d) $KCl + O_2 + O_3$
74. The correct order of thermal stability of hydrogen halides (H—X) is:
 (a) $HI > HBr > HCl > HF$
 (b) $HF > HCl > HBr > HI$
 (c) $HCl > HF > HBr > HI$
 (d) $HI > HCl > HF > HBr$
75. The set with correct order of acidity is:
 (a) $HClO < HClO_2 < HClO_3 < HClO_4$
 (b) $HClO_4 < HClO_3 < HClO_2 < HClO$
 (c) $HClO < HClO_4 < HClO_3 < HClO_2$
 (d) $HClO_4 < HClO_2 < HClO_3 < HClO$
76. The reaction,

$$3ClO^-_{(aq)} \longrightarrow ClO^-_{3(aq)} + 2Cl^-_{(aq)}$$
 is an example of:
 (a) Oxidation reaction (b) Reduction reaction
 (c) Disproportionation (d) Decomposition reaction
77. Hydrogen bond is strongest in:
 (a) $F-H-O$ (b) $F-H-N$
 (c) $F-H-F$ (d) All are equally strong
78. Which of the following has highest bond strength?
 (a) HI (b) HCl
 (c) HF (d) HBr

79. Shape and hybridization of IF_5 respectively are:
 (a) Trigonal bipyramidal, sp^3d
 (b) See-saw, sp^3d
 (c) Square pyramidal, sp^3d^2
 (d) Pentagonal pyramidal, sp^3d^2
80. The oxidation states of iodine in HIO_4 , H_3IO_5 , and H_5IO_6 are respectively:
 (a) +1, +3, +7 (b) +7, +7, +3
 (c) +7, +7, +7 (d) +7, +5, +3
81. The electron affinity values (in kJ mol^{-1}) of three halogens X, Y, and Z are respectively -349, -333 and -325. X, Y, and Z respectively are:
 (a) F_2 , Cl_2 , Br_2 (b) Cl_2 , F_2 and Br_2
 (c) Cl_2 , Br_2 , F_2 (d) Br_2 , Cl_2 and F_2
82. Which one of the following reactions does not occur?
 (a) $\text{F}_2 + 2\text{Cl}^- \longrightarrow 2\text{F}^- + \text{Cl}_2$
 (b) $\text{Cl}_2 + 2\text{F}^- \longrightarrow 2\text{Cl}^- + \text{F}_2$
 (c) $\text{Br}_2 + 2\text{I}^- \longrightarrow 2\text{Br}^- + \text{I}_2$
 (d) $\text{Cl}_2 + 2\text{Br}^- \longrightarrow 2\text{Cl}^- + \text{Br}_2$
83. Select the correct order from the following:
 (a) $\text{N}_2\text{O} < \text{N}_2\text{O}_3 < \text{NO}$; Acidic character
 (b) $\text{MgO} > \text{Al}_2\text{O}_3 > \text{SiO}_2$; Basic character
 (c) $\text{Fe}^{2+} < \text{Fe}^{3+} < \text{Mn}^{2+}$; Ionic radius order
 (d) $\text{Sc} > \text{La} > \text{Y}$; Ionisation energy order
84. Which of the following is the correct order of strength of H-bonding in the given compound?
 (a) $\text{HF} < \text{NH}_3$ (b) $\text{H}_2\text{O} > \text{H}_2\text{O}_2$
 (c) $\text{H}_2\text{O}_2 > \text{H}_2\text{O}$ (d) $\text{NH}_3 > \text{H}_2\text{O}$
85. In which of the following molecules central atom involve expansion of octet?
 (a) PCl_3 (b) NCl_3
 (c) ClF_3 (d) None of these
86. If pure "p" orbitals are involved in molecule formation, then the shape of H_3O^+ will be:
 (a) Pyramidal (b) Tetrahedral
 (c) Angular (d) Planar
87. Select the correct statement:
 (a) NH_3 has higher bond dipole than NF_3
 (b) CCl_4 is polar molecule
 (c) SF_4 is polar molecule
 (d) IF_7 is polar molecule
88. Arrange the following species according to their bond angle order:
 (I) O_3 (II) NO_2^- (III) FNO
 (a) $\text{I} > \text{II} > \text{III}$ (b) $\text{II} > \text{I} > \text{III}$
 (c) $\text{III} > \text{II} > \text{I}$ (d) $\text{II} > \text{III} > \text{I}$
89. The species which is not tetrahedral in shape is:
 (a) ICl_4^- (b) BI_4^+
 (c) AlH_4^- (d) NF_4
90. Which of the following statements is/are correct regarding IF_5 molecule?
 (I) There is only one lone pair present in equatorial
 (II) All $\angle \text{FIF}$ angles are identical
 (III) There are eight faces in this molecule
 (IV) The number $\angle \text{FIF}$ angles less than 90° is 8
 (a) I, II, and III (b) II, III, and IV
 (c) III and IV (d) III only
91. When a solution of sodium hydroxide is added in excess to the solution of potash alum, we obtain:
 (a) A white precipitate (b) Bluish white precipitate
 (c) A clear solution (d) A crystalline mass
92. B—H—B bridge in B_2H_6 is formed by the sharing of:
 (a) 2 electrons (b) 4 electrons
 (c) 1 electron (d) 3 electrons
93. The bonds present in borazole are:
 (a) $12\sigma, 3\pi$ (b) $9\sigma, 6\pi$
 (c) $6\sigma, 6\pi$ (d) $9\sigma, 9\pi$
94. BCl_3 does not exist as dimer but BH_3 exists as dimer (B_2H_6) because:
 (a) Chlorine is more electronegative than hydrogen
 (b) There is $p_\pi - p_\pi$ back bonding in BCl_3 , but BH_3 does not contain such multiple bonding
 (c) Large-sized chlorine atoms do not fit in between the small boron atoms, whereas small-sized hydrogen atoms fit between boron atoms
 (d) None of these
95. Lead chromate is:
 (a) Red (b) Yellow
 (c) White (d) Black
96. Which of the following is methanide:
 (a) Be_2C (b) CaC_2
 (c) Mn_3C (d) Mg_3C_2
97. Red lead is:
 (a) PbO (b) Pb_3O_4
 (c) PbO_2 (d) HgS
98. Laborer's working with phosphorus suffer from a disease in which bones decay. It is known as:

- (a) Arthritis (b) Phossy jaw
(c) Rickets (d) Cancer
99. Pure phosphine is not combustible while impure phosphine is combustible; this combustibility is due to the presence of:
(a) P_2H_4 (b) N_2
(c) PH_3 (d) P_2O_5
100. Bond energies in NO , NO^+ , and NO^- are such that:
(a) $NO > NO^+ > NO^-$ (b) $NO^- > NO > NO^+$
(c) $NO^+ > NO^- > NO$ (d) $NO^+ > NO > NO^-$
101. Which of the following are not known?
(a) PH_5 (b) PI_5
(c) NCl_5 (d) All of these
102. The most stable and basic hydride of 15th group is:
(a) NH_3 (b) PH_3
(c) AsH_3 (d) BiH_3
103. The gas which is supposed to be acidic anhydride:
(a) NO_2 (b) CO
(c) N_2O (d) NO
104. Bones glow in the dark because:
(a) They contain shining material
(b) They contain red phosphorus
(c) White phosphorus undergoes slow combustion in contact with air
(d) White phosphorus changes into red form
105. P_4O_{10} on reacting with water does not form:
(a) Tetra metaphosphoric acid
(b) Phosphorous acid
(c) Orthophosphoric acid
(d) Pyrophosphoric acid
106. The number of $P-O-P$ bonds in cyclic metaphosphoric acid is:
(a) Zero (b) Two
(c) Three (d) Four
107. The correct order for acid strength is:
(a) $Al_2O_3 < SiO_2 < P_2O_3 < SO_2$
(b) $SiO_2 < SO_2 < Al_2O_3 < P_2O_3$
(c) $Al_2O_3 < SiO_2 < SO_2 < P_2O_3$
(d) $SO_2 < P_2O_3 < SiO_2 < Al_2O_3$
108. The number of $S-S$ bonds in sulphur trioxide trimer (S_3O_9) is:
(a) 3 (b) 2
(c) 1 (d) 0
109. NH_3 cannot be obtained by:
(a) Heating of NH_4NO_3 or NH_4NO_2
(b) Heating of NH_4Cl or $(NH_4)_2CO_3$
(c) Heating of NH_4NO_3 with $NaOH$
(d) Reaction of AlN or Mg_3N_2 or $CaCN_2$ with H_2O
110. An aqueous solution of BCl_3 is:
(a) Weak acid (b) Weak base
(c) Neutral (d) Strong base
111. In diborane:
(a) 4 bridged hydrogens and two terminal hydrogens are present
(b) 2 bridged hydrogens and four terminal hydrogens are present
(c) 3 bridged hydrogens and three terminal hydrogens are present
(d) None of the above
112. Which of the following metals burns in air at high temperature with the evolution of much heat?
(a) Cu (b) Hg
(c) Pb (d) Al
113. Aluminium (III) chloride forms a dimer because aluminium:
(a) Cannot form a trimer
(b) Has high ionization energy
(c) Belongs to third group
(d) Can have higher coordination number
114. Alum helps in purifying water by:
(a) Forming Si complex with clay particles
(b) Sulphate part which combines with the dirt and removes it
(c) Aluminium which coagulates the mud particles
(d) Making the mud, water soluble
115. The ion(s) that act/s as oxidizing agent in solution is/are:
(a) Tl^+ and Al^{3+} (b) B^{3+} and Al^{3+}
(c) Tl^{3+} only (d) B^{3+} only
116. The stability of +1 oxidation state increases in the sequence:
(a) $Tl < In < Ga < Al$ (b) $In < Tl < Ga < Al$
(c) $Ga < In < Al < Tl$ (d) $Al < Ga < In < Tl$
117. An example of major air pollutant is:
(a) O_2 (b) CO_2
(c) CO (d) He
118. The color imparted by $Co(II)$ compounds to glass is:
(a) Deep blue (b) Green
(c) Yellow (d) Red
119. When PbO_2 reacts with conc. HNO_3 , the gas evolved is:

- (a) NO_2 (b) O_2
(c) N_2 (d) N_2O

120. Graphite is soft and lubricant, extremely difficult to melt. The reason for this anomalous behavior is that graphite:

- (a) Has carbon atoms arranged in large plates of rings of strongly bound carbon atoms with weak inter-plate bonds
(b) Is a non-crystalline substance
(c) Is an allotrope form of carbon
(d) Has molecules of variable molecular masses like polymers

121. Which one of the following is present in the chain structure of silicates?

- (a) $(\text{Si}_2\text{O}_5^{2-})_n$ (b) $(\text{SiO}_3^{2-})_n$
(c) $(\text{SiO}_4)^{4-}$ (d) $\text{Si}_2\text{O}_7^{6-}$

122. Which of the following has the highest calorific value?

- (a) Coal gas (b) Water gas
(c) Producer gas (d) Carbon dioxide gas

123. Among the following substituted silanes the one which will give rise to cross-linked silicone polymer on hydrolysis is:

- (a) R_3SiCl (b) R_4Si
(c) RSiCl_3 (d) R_2SiCl_2

124. C—C bond length is maximum in:

- (a) Diamond (b) Graphite
(c) Naphthalene (d) Fullerene

125. NH_3 has much higher boiling point than PH_3 because:

- (a) NH_3 has much higher molecular mass
(b) NH_3 forms hydrogen bonds
(c) NH_3 contains ionic bonds while PH_3 contains covalent bonds
(d) NH_3 undergoes umbrella inversion

126. By the action of conc. H_2SO_4 , phosphorus changes to:

- (a) Phosphorus acid (b) Metaphosphoric acid
(c) Orthophosphoric acid (d) Pyrophosphoric acid

127. Among the following oxides, the lowest acidic is:

- (a) P_4O_6 (b) P_4O_{10}
(c) As_4O_6 (d) As_4O_{10}

128. The basic character of the hydrides of Vth group elements decreases in the order:

- (a) $\text{NH}_3 > \text{PH}_3 > \text{AsH}_3 > \text{SbH}_3$
(b) $\text{SbH}_3 > \text{AsH}_3 > \text{PH}_3 > \text{NH}_3$
(c) $\text{NH}_3 > \text{SbH}_3 > \text{PH}_3 > \text{AsH}_3$
(d) $\text{SbH}_3 > \text{PH}_3 > \text{AsH}_3 > \text{NH}_3$

JEE (Advanced) Exercises

Single Correct Answer Type

- Nitrogen forms N_2 but phosphorus is converted into P_4 from P_2 . The reason for this is:
(a) Triple bond is present between phosphorus atoms
(b) $p\pi-p\pi$ bonding is weak
(c) $p\pi-p\pi$ bonding is strong
(d) Multiple bond is formed easily
- The element which forms oxides in all the oxidation states from +1 to +5 is:
(a) N (b) P
(c) As (d) Sb
- N_2 forms NCl_3 , whereas P can form both PCl_3 and PCl_5 . Why?
(a) P has d -orbitals which can be used for bonding but N_2 does not have
(b) N atom is larger in size than P
(c) P is more reactive towards Cl than N
(d) None of the above
- Which of the following compound is responsible for catching fire spontaneously in Holme's signal?
(a) P_2H_4 (b) PH_3
(c) C_2H_4 (d) All of these
- Which is in the decreasing order of boiling points of Vth group hydrides?
(a) $\text{NH}_3 > \text{PH}_3 > \text{AsH}_3 > \text{SbH}_3$
(b) $\text{SbH}_3 > \text{AsH}_3 > \text{PH}_3 > \text{NH}_3$
(c) $\text{PH}_3 > \text{NH}_3 > \text{AsH}_3 > \text{SbH}_3$
(d) $\text{SbH}_3 > \text{NH}_3 > \text{AsH}_3 > \text{PH}_3$
- Which compound acts as an oxidizing as well as a reducing agent?
(a) SO_2 (b) Mn_2O_7
(c) Al_2O_3 (d) CrO_3
- Hydrolysis of one mole of peroxydisulphuric acid produces:
(a) Two moles of sulphuric acid
(b) Two moles of peroxymonosulphuric acid
(c) One mole of sulphuric acid and one mole of peroxymonosulphuric acid
(d) One mole of sulphuric acid, one mole of peroxymonosulphuric acid, and one mole of hydrogen peroxide
- Which of the following is the most powerful oxidizing agent?

- (a) H_2SO_4 (b) H_3BO_3
 (c) HPO_3 (d) H_3PO_4
9. The most powerful oxidizing agent is:
 (a) Fluorine (b) Chlorine
 (c) Bromine (d) Iodine
10. Which one of the hydric acids does not form any precipitate with AgNO_3 ?
 (a) HF (b) HCl
 (c) HBr (d) HI
11. The strongest reducing agent is:
 (a) F^- (b) Cl^-
 (c) Br^- (d) I^-
12. HBr and HI can reduce H_2SO_4 , HCl can reduce KMnO_4 , and HF can reduce:
 (a) $\text{K}_2\text{Cr}_2\text{O}_7$ (b) KMnO_4
 (c) H_2SO_4 (d) None of these
13. $\text{Na}_2\text{S}_2\text{O}_3$ is oxidized by I_2 to:
 (a) Na_2S (b) Na_2SO_4
 (c) NaHSO_3 (d) $\text{Na}_2\text{S}_4\text{O}_6$
14. Which of the possible molecule/species is having maximum values for dipole moment (where "A" is the central atom)?
 (a) AX_3 (having one lone pair on central atom)
 (b) AX_4 (Tetrahedral)
 (c) AX_4Y (having no lone pair on central atom)
 (d) Cannot be predicted
15. Which of the following is incorrect match?
 (a) SiF_4 : Can act as Lewis acid
 (b) Benzene : All C-atoms are sp^2 hybridized
 (c) PBr_3 : Non polar
 (d) $\text{CHF}=\text{C}=\text{CHF}$: Nodal planes of π -bonds are not lying in same plane
16. Which of the following molecule/species is having minimum number of lone pair on its central atom?
 (a) BrF_3 (b) BrF_4^-
 (c) XeF_5^+ (d) I_3^-
17. Select the correct statement:
 (a) Basicity of phosphorous acid is three
 (b) Perbromic acid is having only one peroxy linkage
 (c) $\beta\text{-SO}_3$ is having cyclic structure
 (d) Borazine is having zero dipole moment
18. Which of the following statement is not correct regarding SF_2Cl_2 molecule?
 (a) Two axial bond lengths are longer compared to two equatorial bond lengths
 (b) Two S-F bond lengths are identical
 (c) Two S-Cl bond lengths are identical
 (d) Lone pair is not changing its position
19. Select the correct statement regarding oxides:
 (a) As the electronegativity of element increases, acidic character of oxide increases
 (b) Down the group the acidic nature of oxide increases
 (c) Both B_2O_3 and Al_2O_3 are acidic oxides
 (d) Nitrogen forms all the three types of oxides (neutral, basic, and acidic)
20. Which of the following structure is non-planar?
 (a) $\text{Na}_3\text{B}_3\text{O}_6$
 (b) I_2Cl_6
 (c) Sheet silicates
 (d) Inorganic graphite layer
21. Alumina on heating with carbon in nitrogen atmosphere gives:
 (a) $\text{Al} + \text{CO}$ (b) $\text{Al} + \text{CO}_2$
 (c) $\text{AlN} + \text{CO}$ (d) $\text{Al} + \text{CO} + \text{N}_2$
22. Which of the following has the minimum heat of dissociation?
 (a) $[(\text{CH}_3)_3\text{N} \rightarrow \text{BF}_3]$
 (b) $[(\text{CH}_3)_3\text{N} \rightarrow \text{B}(\text{CH}_3)_2\text{F}_2]$
 (c) $[(\text{CH}_3)_3\text{N} \rightarrow \text{B}(\text{CH}_3)_2\text{F}]$
 (d) $[(\text{CH}_3)_3\text{N} \rightarrow \text{B}(\text{CH}_3)_3]$
23. Anhydrous AlCl_3 is obtained from:
 (a) Hydrochloric acid and aluminium metal
 (b) Dry hydrogen chloride gas and aluminium metal
 (c) Alumina and chlorine gas
 (d) None of these
24. Aluminium vessel should not be washed with materials containing washing soda because:
 (a) Washing soda is expensive
 (b) Washing soda is easily decomposed
 (c) Washing soda reacts with aluminium to form soluble aluminate
 (d) Washing soda reacts with aluminium to form insoluble aluminium oxide
25. In the reaction $\text{LiH} + \text{AlH}_3 \rightarrow \text{LiAlH}_4$, AlH_3 and LiH act as:
 (a) Lewis acid and Lewis base
 (b) Lewis base and Lewis acid
 (c) Bronsted base and Bronsted acid
 (d) None of these

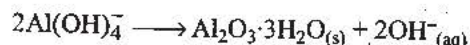
26. The solution of borax in water is:
 (a) Neutral (b) Acidic
 (c) Alkaline (d) Amphoteric
27. Al_2O_3 can be converted into anhydrous AlCl_3 by heating:
 (a) A mixture of Al_2O_3 and carbon in dry Cl_2 gas
 (b) Al_2O_3 with Cl_2 gas
 (c) Al_2O_3 with HCl gas
 (d) Al_2O_3 with NaCl solid state
28. The reaction,
 $\text{B}(\text{OH})_3 + \text{NaOH} \longrightarrow \text{Na}[\text{B}(\text{OH})_4]$ can be made to proceed in forward direction by:
 (a) Adding *cis*-1, 2-diol (b) Adding borax
 (c) Adding *trans*-1, 2-diol
 (d) Adding Na_2HPO_4
29. Aluminium chloride exists as dimer, Al_2Cl_6 , in solid state as well as in solution of non-polar solvents such as C_6H_6 . When dissolved in water it gives:
 (a) $\text{Al}_2\text{O}_3 + 6\text{HCl}$ (b) $[\text{Al}(\text{H}_2\text{O})_6] + 3\text{Cl}^-$
 (c) $[\text{Al}(\text{OH})_6]^{3-} + 3\text{HCl}$ (d) $\text{Al}^{3+} + 3\text{Cl}^-$
30. Carbon burns in air and forms two oxides CO and CO_2 . This shows that carbon has:
 (a) Two allotropic forms (b) Two oxidation states
 (c) Two isotopes
 (d) Four electrons in valence shell
31. By addition of excess of sodium hydroxide solution to stannous chloride solution, we obtain:
 (a) $\text{Sn}(\text{OH})_2$ (b) $\text{SnO}_2 \cdot \text{H}_2\text{O}$
 (c) Na_2SnO_3 (d) Na_2SnO_2
32. Man dies in an atmosphere of carbon monoxide because it:
 (a) Combines with the O_2 present in the body to form CO_2 .
 (b) Reduces the organic matter of tissues.
 (c) Combines with hemoglobin of blood, making it incapable of absorbing O_2 .
 (d) Dries up the blood.
33. Which statement is correct with respect to the property of the elements with increase in atomic number in the carbon family?
 (a) Their metallic character decreases.
 (b) The stability of $2+$ oxidation state increases.
 (c) Their ionization energy increases.
 (d) Their atomic size decreases.
34. Which gas is essential constituent of almost all fuel gases?
 (a) CO_2 (b) N_2
 (c) CO (d) H_2O
35. Regular use of which of the following fertilizer increases the acidity of soil:
 (a) Potassium nitrate (b) Urea
 (c) Superphosphate of lime
 (d) Ammonium sulphate
36. The oxidation state (O.S.) of S-atom is -1 in:
 (a) FeS (b) FeS_2
 (c) $\text{NaO}-\overset{\overset{\text{O}}{\parallel}}{\text{S}}-\text{ONa}$ (d) $\text{NaO}-\overset{\overset{\text{O}}{\parallel}}{\text{S}}-\overset{\overset{\text{O}}{\parallel}}{\text{S}}-\text{ONa}$
37. In silicon dioxide:
 (a) Each silicon atom is surrounded by four oxygen atoms and each oxygen atom is bonded to two silicon atoms
 (b) Each silicon atom is surrounded by two oxygen atoms and each oxygen atom is bonded to two silicon atoms
 (c) Silicon atom is bonded to two oxygen atoms
 (d) There are double bonds between silicon and oxygen atoms
38. Name the structure of silicate in which three oxygen atoms of $[\text{SiO}_4]^{4-}$ are shared:
 (a) Pyrosilicate (b) Sheet silicate
 (c) Linear chain silicate
 (d) Three dimensional silicate
39. Which one is not an acid salt?
 (a) NaH_2PO_2 (b) NaH_2PO_3
 (c) NaH_2PO_4 (d) None of these
40. Sodium nitrate on heating with zinc dust and caustic soda gives:
 (a) NaNO_2 (b) NH_3
 (c) NO_2 (d) N_2O
41. The most thermodynamically stable allotropic form of phosphorus is:
 (a) Red (b) White
 (c) Black (d) Yellow
42. Which of the following statement regarding sulphur is incorrect?
 (a) At 600°C , the gas mainly consists of S_2 molecules
 (b) The oxidation state of sulphur is never less than $+4$ in its compounds
 (c) S_2 molecule is paramagnetic
 (d) The vapor at 200°C consists mostly of S_8 rings

43. Which is an ozonide?
 (a) KO_3 (b) NH_4O_3
 (c) Cr_2O_3 (d) Both (a) and (b)
44. Identify the incorrect statement among the following:
 (a) Ozone reacts with SO_2 to give SO_3 .
 (b) Silicon reacts with $\text{NaOH}(\text{aq.})$ in the presence of air to give Na_2SiO_3 and H_2O .
 (c) Cl_2 reacts with excess of NH_3 to give N_2 and HCl .
 (d) Br_2 reacts with hot and strong NaOH solution to give NaBr , NaBrO_4 , and H_2O .
45. When Na_2S is added to sodium nitroprusside solution:
 (a) Beautiful violet color is produced
 (b) A complex $[\text{Fe}(\text{CN})_5\text{NOS}]^{4-}$
 (c) The complex $\text{Na}_4[\text{Fe}(\text{CN})_5\text{NOS}]$ is formed
 (d) All of these
46. One gas bleaches the color of the flowers by reduction while the other by oxidation. The gases are:
 (a) CO and CO_2 (b) H_2S and Br_2
 (c) SO_2 and Cl_2 (d) NH_3 and SO_3
47. $[\text{X}] + \text{H}_2\text{SO}_4 \longrightarrow [\text{Y}]$ a colorless gas with irritating smell,
 $[\text{Y}] + \text{K}_2\text{Cr}_2\text{O}_7 + \text{H}_2\text{SO}_4 \longrightarrow \text{Green solution, } [\text{X}] \text{ and } [\text{Y}]$ is:
 (a) SO_3^{2-} , SO_2 (b) Cl^- , HCl
 (c) S^{2-} , H_2S (d) CO_3^{2-} , CO_2
48. Which of the following is not oxidized by O_3 ?
 (a) KI (b) FeSO_4
 (c) KMnO_4 (d) K_2MnO_4
49. The halide which does not give a precipitate with AgNO_3 is:
 (a) F^- (b) Cl^-
 (c) Br^- (d) I^-
50. Which ion can bring about the highest oxidation state of a transition metal?
 (a) F^- (b) Cl^-
 (c) Br^- (d) I^-
51. Which halogen can be purified by sublimation?
 (a) F_2 (b) Cl_2
 (c) Br_2 (d) I_2
52. The ion that cannot undergo disproportionation is:
 (a) ClO_4^- (b) ClO_3^-
 (c) ClO_2^- (d) ClO^-
53. In the reaction between Cl_2 and hot conc. NaOH , which is correct:
 (a) The oxidation number of Cl_2 changes from 0 to +5 and 0 to -1
 (b) Cl_2 undergoes disproportionation
 (c) Cl_2 undergoes self or auto redox change
 (d) All of these
54. The correct order of acidic nature is:
 (a) $\text{Cl}_2\text{O}_7 > \text{SO}_3 > \text{P}_4\text{O}_{10}$ (b) $\text{CO}_2 > \text{N}_2\text{O}_5 > \text{SO}_3$
 (c) $\text{Na}_2\text{O} > \text{MgO} > \text{Al}_2\text{O}_3$ (d) $\text{K}_2\text{O} > \text{CaO} > \text{MgO}$
55. The product of oxidation of I^- with MnO_4^- in alkaline medium is:
 (a) IO_3^- (b) I_2
 (c) IO^- (d) IO_4^-
56. The number of hydrogen atoms attached to phosphorus atom in hypophosphorous acid is:
 (a) Zero (b) Two
 (c) One (d) Three
57. Which of the following is only acidic in nature?
 (a) $\text{Be}(\text{OH})_2$ (b) $\text{Mg}(\text{OH})_2$
 (c) $\text{B}(\text{OH})_3$ (d) $\text{Al}(\text{OH})_3$
58. Which one of the following statements regarding helium is incorrect?
 (a) It is used to produce and sustain powerful superconducting magnets
 (b) It is used as a cryogenic agent for carrying out experiments at low temperatures
 (c) It is used to fill gas balloons instead of hydrogen because it is lighter than hydrogen and is non-inflammable
 (d) It is used in gas-cooled nuclear reactors
59. Which products are expected from the disproportionation of hypochlorous acid?
 (a) HClO_3 and Cl_2O (b) HClO_2 and HClO
 (c) HCl and Cl_2O (d) HCl and HClO_3
60. In view of the signs of $\Delta_r G^\circ$ for the following reactions
 $\text{PbO}_2 + \text{Pb} \rightarrow 2 \text{PbO}$, $\Delta_r G^\circ < 0$
 $\text{SnO}_2 + \text{Sn} \rightarrow 2 \text{SnO}$, $\Delta_r G^\circ > 0$
 Which oxidation states are more characteristic for lead and tin?
 (a) For lead + 4, for tin + 2
 (b) For lead + 2, for tin + 2
 (c) For lead + 4, for tin + 4
 (d) For lead + 2, for tin + 4
61. Select the correct statement about elements of group 15:

- (a) The order of stability of oxidation state for +3 is $\text{Bi}^{3+} > \text{Sb}^{3+}$ and for +5 is $\text{Bi}^{5+} < \text{Sb}^{5+} < \text{As}^{5+}$
- (b) In the case of nitrogen, all oxidation states from +1 to +4 tend to disproportionate in acid solution.
- (c) There is a considerable increase in covalent radius from N to P but from As to Bi only a small increase in covalent radius is observed.
- (d) All of these
62. Aluminium chloride exists as dimer, Al_2Cl_6 , in solid state as well as in solution of non-polar solvents such as benzene. When dissolved in water, it gives
- (a) $\text{Al}^{3+} + 3\text{Cl}^-$ (b) $[\text{Al}(\text{H}_2\text{O})_6]^{3+} + 3\text{Cl}^-$
- (c) $[\text{Al}(\text{OH})_6]^{3-} + 3\text{HCl}$ (d) $\text{Al}_2\text{O}_3 + 6\text{HCl}$
63. By the action of conc H_2SO_4 , phosphorus changes to:
- (a) Phosphorus acid (b) Orthophosphoric acid
- (c) Metaphosphoric acid (d) Pyrophosphoric acid
64. The liquefied metal expanding on solidification is:
- (a) Al (b) Ga
- (c) Zn (d) Cu
65. A layer of coke is spread over bauxite during extraction of aluminium. This acts as a/an:
- (a) Flux
- (b) Slag to remove impurities
- (c) Reducing agent
- (d) Insulation and does not allow heat to escape
66. BF_3 is used as catalyst in several industrial processes due to its:
- (a) Strong reducing nature (b) Weak reducing action
- (c) Strong Lewis acid nature
- (d) Weak Lewis acid character
67. The chemical formula of feldspar is:
- (a) KAlSi_3O_8 (b) Na_3AlF_6
- (c) NaAlO_2
- (d) $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 4\text{Al}(\text{OH})_3$
68. A mixture of boron trichloride and hydrogen is subjected to silent electric discharge to form 'A' and HCl . 'A' is mixed with NH_3 and heated to 200°C to form 'B'. The formula of 'B' is:
- (a) H_3BO_3 (b) B_2O_3
- (c) B_2H_6 (d) $\text{B}_3\text{N}_3\text{H}_6$
69. In aluminium extraction by the Baeyer's process, alumina is extracted from bauxite by sodium hydroxide at high temperature and pressure.

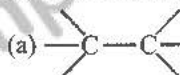
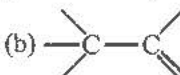
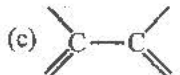
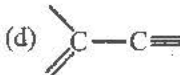


Solid impurities such as Fe_2O_3 and SiO_2 are removed and then $\text{Al}(\text{OH})_3$ is reprecipitated.



In the industrial world:

- (a) Carbon dioxide is added to precipitate the alumina
- (b) Temperature and pressure are dropped and the super saturated solution seeded
- (c) Both (a) and (b) are practised
- (d) The water is evaporated
70. Solder is an alloy of:
- (a) 70 % Pb, 30 % Sn (b) 33 % Pb, 67 % Sn
- (c) 80 % Pb, 20 % Sn (d) 90 % Cu, 10 % Sn
71. Which of the following halide of carbon is used as refrigerant?
- (a) CCl_4 (b) CF_4
- (c) CH_2Cl_2 (d) CF_2Cl_2
72. Butter of tin is:
- (a) $\text{SnCl}_2 \cdot 5\text{H}_2\text{O}$ (b) $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$
- (c) $\text{SnCl}_4 \cdot 4\text{H}_2\text{O}$ (d) $\text{SnCl}_4 \cdot 5\text{H}_2\text{O}$
73. Me_2SiCl_2 on hydrolysis followed by polymerization will produce:
- (a) $\text{Me}_2\text{Si}(\text{OH})_2$ (b) $\text{Me}_2\text{Si}=\text{O}$
- (c) $-\text{O}-(\text{Me})_2\text{Si}-\text{O}-$ (d) Me_2SiClOH
74. Litharge is chemically:
- (a) PbO (b) PbO_2
- (c) Pb_3O_4 (d) $\text{Pb}(\text{CH}_3\text{COO})_2$
75. The straight chain polymer is formed by:
- (a) Hydrolysis of CH_3SiCl_3 followed by condensation polymerization
- (b) Hydrolysis of $(\text{CH}_3)_4\text{Si}$ followed by addition polymerization
- (c) Hydrolysis of $(\text{CH}_3)_2\text{SiCl}_2$ followed by condensation polymerization
- (d) Hydrolysis of $(\text{CH}_3)_3\text{SiCl}$ followed by condensation polymerization
76. On heating $\text{K}_4\text{Fe}(\text{CN})_6$ with conc. H_2SO_4 gives the gas:
- (a) SO_2 (b) CO_2
- (c) CO (d) NO_2
77. Blasting of TNT is done by mixing:
- (a) NH_4Cl (b) NH_4NO_3
- (c) NH_4NO_2 (d) $(\text{NH}_4)_2\text{SO}_4$
78. Which of the following is the incorrect statement for PH_3 ?
- (a) It is less basic than NH_3
- (b) It has rotten fish smell

- (c) It has pyramidal structure
(d) It does not show reducing properties
79. A pale blue liquid which is obtained by reacting equimolar mixture of two gases at -30°C is:
(a) N_2O_3 (b) N_2O
(c) N_2O_4 (d) N_2O_5
80. $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ on heating liberates a gas. The same gas will be obtained by:
(a) Heating NH_4NO_2 (b) Heating NH_4NO_3
(c) Treating Mg_3N_2 with H_2O
(d) Heating H_2O_2 on NaNO_2
81. Which one of the following oxides of nitrogen is solid?
(a) NO_2 (b) N_2O
(c) N_2O_3 (d) N_2O_5
82. Which is used to produce smoke screens?
(a) Zinc sulphide (b) Calcium phosphide
(c) Zinc phosphide (d) Sodium carbonate
83. The percentage of p -character in the orbitals forming P—P bonds in P_4 is:
(a) 25 (b) 33
(c) 50 (d) 75
84. Which of the following is the correct order of increasing enthalpy of vaporization?
(a) $\text{NH}_3 < \text{PH}_3 < \text{AsH}_3$ (b) $\text{AsH}_3 < \text{PH}_3 < \text{NH}_3$
(c) $\text{PH}_3 < \text{AsH}_3 < \text{NH}_3$ (d) $\text{NH}_3 < \text{AsH}_3 < \text{PH}_3$
85. Chlorine reacts with excess of ammonia to form:
(a) NH_4Cl (b) $\text{N}_2 + \text{HCl}$
(c) $\text{N}_2 + \text{NH}_4\text{Cl}$ (d) $\text{N}_2 + \text{NCl}_3$
86. The reaction of P_4 with X leads selectively to P_4O_6 . The X is:
(a) A dry O_2 (b) A mixture of O_2 and N_2
(c) Moist O_2
(d) O_2 in presence of aqueous NaOH
87. Which shows maximum catenation property?
(a) Te (b) Se
(c) S (d) O
88. There is no S—S bond in:
(a) $\text{S}_2\text{O}_4^{2-}$ (b) $\text{S}_2\text{O}_5^{2-}$
(c) $\text{S}_2\text{O}_3^{2-}$ (d) $\text{S}_2\text{O}_7^{2-}$
89. Which of the following bonds has the highest energy?
(a) Se—Se (b) Te—Te
(c) S—S (d) O—O
90. Which of the following does not have S—S linkage?
(a) $\text{S}_2\text{O}_8^{2-}$ (b) $\text{S}_2\text{O}_6^{2-}$
(c) $\text{S}_2\text{O}_5^{2-}$ (d) $\text{S}_2\text{O}_3^{2-}$
91. The element evolving two different gases on reaction with conc. H_2SO_4 is:
(a) P (b) C
(c) Hg (d) S
92. The function of $\text{Fe}(\text{OH})_3$ in the contact process is:
(a) To detect colloidal impurity
(b) To remove moisture
(c) To remove dust particles
(d) To remove arsenic impurity
93. Aqueous solution of $\text{Na}_2\text{S}_2\text{O}_3$ on reaction with Cl_2 gives:
(a) $\text{Na}_2\text{S}_4\text{O}_6$ (b) NaHSO_4
(c) NaCl (d) NaOH
94. In which of the following molecule, the number of possible $\angle\text{XAX}$ angles is maximum in the anionic part of their solid state? [A : Central atom; X : surrounding atom]
(a) PBr_5 (b) N_2O_5
(c) PCl_5 (d) Cl_2O_6
95. Which of the following compound have X—O—X linkage where ' X ' is the so called central atom like P, S etc?
(a) $\text{P}_2\text{O}_8^{4-}$ (b) $\text{S}_2\text{O}_3^{2-}$
(c) $\gamma\text{-SO}_3$ (d) $\text{S}_2\text{O}_5^{2-}$
96. In which of the following type of bond, C—C bond distance will be minimum?
(a)  (b) 
(c)  (d) 
97. Which of the following is pseudo alum?
(a) $(\text{NH}_4)_2\text{SO}_4 \cdot \text{Fe}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
(b) $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
(c) $\text{MnSO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
(d) None of these
98. Among the halides.
1. BCl_3 2. AlCl_3
3. GaCl_3 4. InCl_3
The order of decreasing Lewis acid character is:
(a) 1, 2, 3, 4 (b) 4, 3, 2, 1
(c) 3, 4, 2, 1 (d) 2, 3, 4, 1
99. Which of the following has smell resembling to bleaching powder?
(a) NO_2 (b) HNO_4
(c) HNO_3 (d) None of these