INDIAN SCHOOL MUSCAT

SENIOR SECTION

DEPARTMENT OF CHEMISTRY

CHAPTER –The p Block elements

OBJECTIVE TYPE QUESTIONS

Multiple choice type questions

1. The basic character of NH_3, PH_3, AsH_3 and SbH_3 decreases in the order
   (a) $SbH_3 > PH_3 > AsH_3 > NH_3$
   (b) $NH_3 > PH_3 > AsH_3 > SbH_3$
   (c) $NH_3 > SbH_3 > PH_3 > AsH_3$
   (d) $AsH_3 > PH_3 > SbH_3 > NH_3$
2. Nitrogen is unable to form penta halides because of the
   (a) presence of 2s and 2p orbitals
   (b) absence of 3d orbitals
   (c) absence of 3p and 3d orbitals
   (d) absence of 3s, 3p and 3d orbitals
3. Which among the following is the least basic?
   (a) NCl_3 (b) NBr_3
   (c) NI_3 (d) NF_3
4. When SO_2 gas is passed into an acidified $K_2Cr_2O_7$ solution, the oxidation number of chromium changes from
   (a) +3 to +6 (b) +6 to +3
   (c) +12 to +3 (d) +6 to –3
5. The catalyst used in the manufacture of HNO3 by Ostwald's process is :
   (a) platinum gauze (b) vanadium pentoxide
   (c) finely divided nickel (d) platinum black .
6. Which of the following is the strongest reducing agent ?
   (a) NH_3 (b) PH_3
   (c) BiH_3 (d) SbH_3
7. Maximum covalency of nitrogen is _____.
   (a) 3 (b) 5
   (c) 4 (d) 6
8. Which of the following element will form acidic oxides of type E_2O_3?
   (a) As (b) Sb
   (c) Bi (d) P
9. Which of the following hydrides is most acidic ?

(a) H_2Te (b) H_2Se
(c) H_2O (d) H_2S

10. Which of the following hydrides shows the highest boiling point ?
(a) H_2O (b) H_2S
(c) H_2Se (d) H_2Te
11. Which of the following form of the sulphur shows paramagnetic behaviour ?
(a) S_8 (b) S_6
(c) S_2 (d) All of these
12. Which of the following oxo acid of sulphur has O–O bond ?
(a) $H_2S_2O_7$ (b) $H_2S_2O_8$
(c) $H_2S_2O_6$ (d) $H_2S_2O_5$
13. Bleaching action of SO_2 is due to its
(a) oxidising property (b) acidic property
(c) reducing property (d) basic property
14. Which one of the following order is correct for the bond energies of halogen molecules ?
(a) $I_2 > Cl_2 > Br_2$ (b) $Br_2 > Cl_2 > I_2$
(c) $I_2 > Br_2 > Cl_2$ (d) $Cl_2 > Br_2 > I_2$
15. Interhalogen compounds are more reactive than the individual halogen because
(a) two halogens are present in place of one
(b) they are more ionic
(c) their bond energy is less than the bond energy of the halogen molecule
(d) they carry more energy
16. Which of the following is observed when Cl_2 reacts with hot and concentrated NaOH?
(a) NaCl , NaOCl (b) NaCl , $NaClO_2$
(c) NaCl , $NaClO_3$ (d) NaOCl , $NaClO_3$
17. The shape of XeO_2F_2 molecule is
(a) trigonal bipyramidal (b) square planar
(c) tetrahedral (d) see-saw
18. Which has trigonal bipyramidal shape ?
(a) $XeOF_4$ (b) XeO_3
(c) XeO_3F_2 (d) $XeOF_2$
19. What is the change observed when AgCl reacts with NH_3?
(a) White ppt is formed
(b) Solution become colourless
(c) Yellow ppt is formed
(d) No change is observed

20. The formation of $O_2^+[PtF_6]$- is the basis for the formation of xenon fluorides. This is because
    (a) O_2 and Xe have comparable sizes
    (b) both O_2 and Xe are gases
    (c) O_2 and Xe have comparable ionisation energies
    (d) Both (a) and (c)
21. Fluorine is a stronger oxidising agent than chlorine in aqueous solution. This is attributed to many factors except
    (a) heat of dissociation (b) ionisation potential
    (c) heat of hydration (d) electron gain enthalpy
22. Which of the following is an acidic oxide?
    (a) Mn_2O_7 (b) Na_2O
    (c) N_2O (d) BaO
23. In nitrogen family, the H-M-H bond angle in the hydrides gradually becomes closer to 90º on going from N to Sb. This shows that gradually
    (a) The basic strength of the hydrides increases
    (b) Almost pure p-orbitals are used for M-H bonding
    (c) The bond energies of M-H bonds increase
    (d) The bond pairs of electrons become nearer to the central atom
24. Which one of the following arrangements does not give the correct picture of the trends indicated against it ?
    (i) $F_2 > Cl_2 > Br_2 > I_2$: Oxidizing power
    (ii) $F_2 > Cl_2 > Br_2 > I_2$: Electron gain enthalpy
    (iii) $F_2 > Cl_2 > Br_2 > I_2$: Bond dissociation energy
    (iv) $F_2 > Cl_2 > Br_2 > I_2$: Electronegativity.
    (a) (ii) and (iv) (b) (i) and (iii)
    (c) (ii) and (iii) (d) (ii), (iii) and (iv)
25. Electronegativity of oxygen is more than sulphur yet H_2S is acidic while water is neutral. This is because
    (a) water is highly associated compound
    (b) molecular mass of H_2S is more than H_2O
    (c) H_2S is gas while H_2O is a liquid
    (d) H–S bond is weaker than H–O bond
26. Which one of the following is isostructural with ICl_4^-
    (a)XeF_6
    (b)XeF_4
    (c)XeF_2
    (d)XeF_8^{2-}

27. In the reaction $2Br^- + X_2 \rightarrow Br_2 + 2X^-$; X_2 is

(a)Cl_2 (b)Br_2 (c)I_2 (d)N_2

28. The increase in boiling points of the noble gases from He to Xe is due to
    (a) Decrease in ionisation enthalpy
    (b) Increase in polarisation
    (c) Increase in atomic volume
    (d) Increae in electron gain enthalpy
29. When SO_2 is passed through acidified $K_2Cr_2O_7$ Solution,
    (a) The solution turns blue
    (b) The solution is decolourised
    (c) SO_2 is reduced
    (d) Green $Cr_2(SO_4)_3$ is formed
30. Which of the following is tertrahedral in shape
    (a) ICl_4^-__
    (b) $POCl_3$
    (c) SF_4
    (d) NO_3-
31. Which of the statement is incorrect for XeO_4

    (a) four pπ-dπ bonds are present

    (b) four sp^3 – p σ bonds are present

    (c) It has a tetrahedral shape

    (d) It has a square planar shape

32. A brown ring is formed in the ring test for NO_3^- ion. It is due to the formation of
    (a) $[Fe(H_2O)_5\ (NO)]^{2+}$
    (b) $FeSO_4.NO_2$
    (c) $[Fe(H_2O)_4(NO)_2]^{2+}$
    (d) $FeSO_4.HNO_3$

33. Which of the following is /are involved in pΠ-dΠ bonding
    (a) $P(C_2H_5)_3$ (b) $As(C_2H_5)_3$ (c)$POCl_3$ (d)$COCl_2$
34. A black compound of manganese reacts with a halogen acid to give greenish yellow gas. When excess of this gas reacts with NH_3 an unstable trihalide is formed. In this process the oxidation state of nitrogen changes from _____.
    (a) – 3 to +3

    (b) – 3 to 0

    (c) – 3 to +5

    (d) 0 to – 3

35. The correct order of oxidising power is
(a) $HClO_4 > HClO_3 > HClO_2 > HClO$
(b) $HOCl > HClO_2 > HClO_3 > HClO_4$
(c) $HClO_3 > HClO_4 > HClO_2 > HClO$
(d) $HClO_2 > HOCl > HClO_3 > HClO_4$

36. Hot cone. H_2SO_4 acts as moderately strong oxidising agent. It oxidises both metals and non-metals. Which of the following element is oxidised by cone. H_2SO_4 into two gaseous products? [NCERT Exemplar]
(a) Cu (b) S (c) C (d) Zn

37. The boiling points of hydrides of group 16 are in the order
(a) $H_2O > H_2Te > H_2S > H_2Se$
(b) $H_2O > H_2S > H_2Se > H_2Te$
(c) $H_2O > H_2Te > H_2Se > H_2S$
(d) None of these

38. Fluorine differs from rest of the halogens in some of its properties. This is due to
(a) its smaller size and high electronegativity.
(b) lack of d-orbitals.
(c) low bond dissociation energy.
(d) All of the these

39. When chlorine reacts with cold and dilute solution of sodium hydroxide, it forms
(a) Cl^- and ClO^-
(b) Cl^- and ClO_2^-
(c) Cl^- and ClO_3^-
(d) Cl^- and ClO_4^-

40. Helium is preferred to be used in balloons instead of hydrogen because it is
(a) incombustible
(b) lighter than hydrogen
(c) more abundant than hydrogen
(d) non polarizable

41. Which of the following is planar?
(a) XeO_4 (b) XeO_3 (c) XeO_2F_2 (d) XeF_4

A statement of assertion is followed by a statement of reason. Mark the correct choice from the options given below:

(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true but reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

42. **Assertion :** Dinitrogen is inert at room temperature.
    Reason : Dinitrogen directly combines with lithium to form ionic nitrides
43. **Assertion :** Bond angle of H_2S is smaller than H_2O.
    Reason : Electronegativity of the central atom increases, bond angle decreases
44. **Assertion** : Sulphur trioxide is not directly dissolved in water to form sulphuric acid.
    Reason : It results in the formation of dense fog of sulphuric acid which is difficult to condense.
45. **Assertion** : SF_6 cannot be hydrolysed but SF_4 can be.
    Reason : Six F atoms in SF_6 prevent the attack of H_2O on sulphur atom of SF_6
    Fill in the blanks:
46. _____ is an example of oxide of chlorine in which oxidation state of Cl is +6.
47. Partial hydrolysis of XeF_4 gives_____
48. I_2 gets oxidised to _____ by cone. HNO_3.
49. Heating of ammonium dichromate produces_____
50. A gas "X" is passed through water to form a saturated solution. The aqueous solution on treatment with silver nitrate gives a white precipitate. The saturated aqueous solution also dissolves magnesium ribbon with evolution of colourless gas 'Y'. The X and Y, respectively, are_____&_____