RAVI MATHS TUITION CENTER, CHENNAI-82. WHATSAPP.- 8056206308

12TH CBSE CHEMISTRY CHAPTER TEST The p-Block Elements 2

12th Standard CBSE

Chemistry

Exam Time : 01:30:00 Hrs

Total Marks : 60

1) Which of the following does not form a pentachloride? 1
(a) P (b) As (c) Sb (d) N

2) Which of the following on heating does not give nitrogen gas? 1
(a) NH_4NO_3 (b) NH_4NO_2 (c) $Ba(N_3)_2$ (d) $(NH_4)2Cr_2O_7$

3) The element which forms oxides in all oxidation states +I to +V is 1
(a) N (b) P (c) As (d) Sb

4) Which of the following elements is kept in water? 1
(a) White P (b) Na (c) S (d) Si

5) For H_3PO_3 and H_3PO_4, the correct choice is 1
(a) H_3PO_3 is dibasic and reducing
(b) H_3PO_4 is dibasic and non-reducing
(c) H_3PO_4 is tribasic and reducing
(d) H_3PO_3 is tribasic and non-reducing

6) Which of the following is the increasing order of enthalpy of vaporisation? 1
(a) NH_3, PH_3, AsH_3 (b) AsH_3, PH_3, NH_3 (c) NH_3, AsH_3, PH_3
(d) PH_3, AsH_3, NH_3

7) The number of P-O-P bonds in the structure of phosphorus pentoxide and phosphorus trioxide are respectively 1
(a) 6,6 (b) 5,5 (c) 5,6 (d) 6,5

8) Which o the following is not hydrolysed? 1
(a) $AsCl_3$ (b) PF_3 (c) $SbCl_3$ (d) NF_3

9) The value o oxidation number of S in S_8, S_2F_2 and H_2S are respectively 1
(a) -2,+1 and -2 (b) -2, -1 and +2 (c) 0,+1 and +2 (d) 0,+1 and -2

10) Which one of the following arrangements represents the correct order of electron gain enthalpy (with negative sign) of the given atomic species? 1
(a) F< Cl< O< S (b) S< O< Cl > F (c) O< S< F< Cl (d) Cl< F< S< O

11) The element evolving two different gases on reaction with cone. Sulphuric acid is 1
(a) P (b) C (c) Hg (d) S

12) Ozone is tested by 1
(a) Ag (b) Hg (c) Zn (d) Au

13) There are no S-S bond in 1
(a) $S_2O_4^{2-}$ (b) $S_2O_5^{2-}$ (c) $S_2O_3^{2-}$ (d) $S_2O_7^{2-}$

14) Which of the following compounds exists? 1
(a) $KHCl_2$ (b) KHF_2 (c) $KHBr_2$ (d) KHI_2

15) Which of the following has the highest reducing power? 1
(a) HCL (b) HI (c) HBr (d) HF

16) When I_2 is passed through KCl, KF,KBr 1
(a) Cl_2 and Br_2 are evolved (b) Cl_2 is evolved (c) Cl_2, Br_2, F_2 are evolved
(d) none of these

17) Which products are expected from the disproportionation reaction of hypochlorous acid? 1
(a) $HClO_3$ and Cl_2O (b) $HClO_2$ and $HClO_4$ (c) HCl and Cl_2O
(d) HCl and $HClO_3$

18) Which of the following orders is not in accordance with the property stated against it? 1
(a) $F_2 > Cl_2 > Br_2 > I_2$; Bond dissociation energy
(b) $F_2 > Cl_2 > Br_2 > I_2$; oxidising power
(c) HI > HBr > HCl > HF; acidic property power
(d) $F_2 > Cl_2 > Br_2 > I_2$; electronegativity

19) An aqueous solution of KBr is treated with each of the following. In which case bromine will be liberated? 1
(a) Cl_2 (b) HI (c) SO_2 (d) I_2

20) Which of the following gas is filled in the tyres of aeroplanes? 1
(a) H_2 (b) He (c) N_2 (d) Ar

21) The formation of $O_2^+[PtF_6]^-$ is the basis for the formation of xenon fluorides. This is because 1
(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) O2 and Xe have comparable electronegativities.

22) Number of lone pairs of electrons on Xe atoms in XeF_2, XeF_4, XeF_6 and XeO_4 molecules are respectively. 1
(a) 3,2,1,0 (b) 1,3,2,0 (c) 0,2,3,1 (d) 3,2,0,1

23) On addition of conc.H_2SO_4 to a chloride salt, colourless fumes are evolved but in case of iodide salt, violet fumes comes out. This is because 1
(a) H_2SO_4 reduces HI to I_2 (b) HI is of violet colour
(c) HI gets oxidised to I_2 (d) HI changes to HIO_3

24) In quantitative analysis when H_2S is passed through an aqueous solution of salt acidified with dil . HCl, a black precipitate is obtained. On boiling the precipitate with dil . HNO_3 it forms a solution of blue colour. Addition of excess of aqueous solution of ammonia to this solution gives..... 1
(a) deep blue precipitate of $Cu(OH)_2$
(b) deep blue solution of $[Cu(NH_3)_4]^{2+}$ (c) deep blue solution of $Cu(NO_3)_2$
(d) deep blue solution of $Cu(OH)_2.Cu(NO_3)_2$

25) In a cyclo tri metaphosphoric acid molecule, how many single and double bonds are present? 1
(a) 3 double bonds ; 9 single bonds (b) 6 double bonds ; 6 single bonds
(c) 3 double bonds ; 12 single bonds
(d) zero double bonds ; 12 single bonds

26) Which of the following elements can be involved in $p\pi$-$d\pi$ bonding? 1
(a) Carbon (b) Nitrogen (c) Phosphorus (d) Boron

27) Which o the following pairs of ions are isoelectronic and isostructural? 1
(a) CO_3^{2-}, NO_3^- (b) ClO_3^-, CO_3^{2-} (c) SO_3^{2-}, NO_3^- (d) ClO_3^-, SO_3^{2-}

28) Affinity for hydrogen decreases in the group from fluorine to iodine. Which of the halogen acids should have highest bond dissociation enthalpy? 1
(a) HF (b) HCl (c) HBr (d) HI

29) On heating with concentrated NaOH solution in an inert atmosphere of CO_2, white phosphorus gives a gas. Which of the following statement is incorrect about the gas? 1
(a) It is highly poisonous and has smell like rotten fish
(b) It's solution in water decomposes in the presence of light
(c) It is more basic than NH_3 (d) It is less basic than NH_3

30) Which of the following acids forms three series of salts? 1
(a) H_3PO_2 (b) H_3BO_3 (c) H_3PO_4 (d) H_3PO_3

31) Strong reducing behaviour of H_3PO_2 is due to 1
(a) Low oxidation state of phosphorus
(b) Presence of two -OH groups and one P-H
(c) Presence of One -OH group and two P-H bonds
(d) High electron gain enthalpy of phosphorus.

32) On heating, lead nitrate forms oxides of nitrogen and lead. The oxides formed are..... 1

(a) N_2O, PbO (b) NO_2 ,PbO (c) NO, PbO (d) NO, PbO_2

33) A brown ring is formed in the ring test for NO_3^- ion. It is due to the formation of 1

(a) $[Fe(H_2O)_5(NO)]^{2+}$ (b) $FeSO_4.NO_2$ (c) $[Fe(H_2O)_4(NO)_2]^{2+}$

(d) $FeSO_4.HNO_3$

34) Elements of group-15 form compounds in +5 oxidation state. However, bismuth forms only one well characterised compound in +5 oxidation state. The compound is 1

(a) Bi_2O_5 (b) BiF_5 (c) $BiCl_5$ (d) Bi_2S_5

35) On heating ammonium dichromate and barium azide separately we get 1

(a) N_2 in both cases

(b) N_2 with ammonium dichromate and NO with barium azide

(c) N_2O with ammonium dichromate and N_2 with barium azide.

(d) N_2O with ammonium dichromate and NO_2 with barium azide.

36) In the preparation of HNO_3, we get NO gas by catalytic oxidation of ammonia. The moles of NO produced by oxidation of two moles of NH_3 will be 1

(a) 2 (b) 3 (c) 4 (d) 6

37) The oxidation state of central atom in the anion of compound NaH_2PO_2 will be 1

(a) +3 (b) +5 (c) +1 (d) -3

38) Which of the following is not tetrahedral in shape? 1

(a) NH_4^+ (b) $SiCl_4$ (c) SF_4 (d) SO_4^{2-}

39) Which of the following are peroxy acids of sulphur? 1

(a) H_2SO_5 and $H_2S_2O_8$ (b) H_2SO_5 and $H_2S_2O_7$ (c) $H_2S_2O_7$ and $H_2S_2O_8$

(d) $H_2S_2O_6$ and $H_2S_2O_7$

40) Hot conc. H_2SO_4 acts as moderately strong oxidising agent. It oxidises both metals and nonmetals. Which of the following element is oxidised by conc. H_2SO_4 into two gaseous products? 1

(a) Cu (b) S (c) C (d) Zn

41) **Read the passage given below and answer the following questions:** 4

Under the normal conditions, noble gases are monoatomic and have closed shell electronic configuration. Lighter noble gases have low boiling points due to weak dispersion forces between the atoms and the absence of other interatomic interactions. Xenon, one of the important noble gas, forms a series of compounds with fluorine with oxidation number +2, +4 and +6. All xenon fluorides are strong oxidising agents. XeF_4 reacts violently with water to give XeO_3. The geometry of xenon compounds can be deduced by considering the total number of electron pairs in their valence shell.

The following questions are multiple choice questions. Choose the most appropriate answer:

(i) Among noble gases (from He to Xe) only xenon reacts with fluorine to form stable xenon fluorides because xenon

(a) has the largest size
(b) has the lowest ionisation enthalpy
(c) has the highest heat of vapourisation
(d) is the most readily available noble gas.

(ii) The structure of XeO_3 is

(a) square planar **(b) pyramidal** **(c) linear** **(d) T-shaped.**

(iii) In the preparation of compound of xenon, Bartlett had taken $O_2^+ PtF_6^-$ as a base compound. This is because

(a) both O_2 and Xe have same size
(b) both Xe and O_2 have same electron gain enthalpy
(c) both have almost same ionisation enthalpy
(d) both Xe and O_2 are gases.

(iv) The oxidation state of xenon in XeO_3 is

(a) +4 **(b) +2** **(c) +8** **(d) +6**

42) **Read the passage given below and answer the following questions :** 4

Interhalogen compounds are formed when halogen group elements react with each other. These are the compounds which consist of two or more different elements of group - 17. A halogen with large size and low electronegativity reacts with an element of group - 17 with small size and high electronegativity. As the ratio of radius of larger and smaller halogen increases, the number of atoms in a molecule also increases.

The following questions are multiple choice questions. Choose the most appropriate answer :

(i) The stability of interhalogen compounds follows the order

(a) $IF_3 > BrF_3 > ClF_3$ **(b) $ClF_3 > BrF_3 > IF_3$**

(c) $BrF_3 > IF_3 > ClF_3$ **(d) $ClF_3 > IF_3 > BrF_3$**

(ii) Identify the correct match from the following.

(a) $[ICl_2]^-$ -bent **(b) IF_7 - pentagonal bipyramidal**

(c) ClF_3 - trigonal planar **(d) $[BrF_4r]^-$ -square pyramidal**

(iii) In XA_5, the central atom has (both X and A are halogens)

(a) 5 bond pairs and no lone pairs **(b) 5 bond pairs and one lone pair**

(c) 6 bond pairs and no lone pairs **(d) 4 bond pairs and one lone pair.**

(iv) In the known interhalogen compounds, the maximum number of atoms are

(a) 4 **(b) 5**

(c) 8 **(d) 7**

43) **Read the passage given below and answer the following questions :** 4

Noble gases are inert gases with general electronic configuration of ns^2np^6. These are mono atomic, colourless, odourless and tasteless gases. The first compound of noble gases was obtained by the reaction of Xe with PtF_6. A large number of compounds of Xe and fluorine have been prepared till now. The structure of these compounds can be explained on the basis of VSEPR theory as well as concept of hybridisation. The compounds of krypton are fewer. Only the difluoride of krypton (KrF_2) has been studied in detail. Compounds of radon have not isolated but only identified by radio tracer technique. However, no true compounds of helium, neon or argon are yet known.

The following questions are multiple choice questions. Choose the most appropriate answer:

(i) The formula of the compound when Xe and PtF_6 are mixed, is

(a) XeF_6 (b) XeF_4 (c) Xe_2PtF_6 (d) $Xe^+[PtF_6]^-$

(ii) Which of the following is not formed by Xe?

(a) XeF_s (b) XeF (c) XeF_3 (d) All of these

(iii) The number of lone pairs and bond pairs of electrons around Xe in $XeOF_4$ respectively are

(a) O and 5 (b) 1 and 5 (c) 1 and 4 (d) 2 and 3

(iv) Which of the following compounds has more than one lone pair of electrons around central atom?

(a) XeO_3 (b) XeF_2 (c) $XeOF_4$ (d) XeO_2F_2

44) **Read the passage given below and answer the following questions:** 4

All the elements of group 16 have $ns^2\ np^4$ configuration in their outermost shell. Therefore, the atoms of these elements try to gain or share two electrons to achieve noble gas configuration. Sulphur and other elements of group 16 are less electronegative than oxygen, so, they cannot accept electrons easily. By sharing of two electrons with other elements, these elements acquire $ns^2\ np^6$ configuration and exhibit +2 oxidation state. Except oxygen, group 16 elements have vacant d-orbitals in their valence shell to which electrons can be promoted from p- and s-orbitals of the same shell. As a result, they can show +4 and +6 oxidation states also.

The following questions are multiple choice questions. Choose the most appropriate answer:

(i) Oxygen shows +2 oxidation state in

(a) OF_2 (b) H_2O (c) Cl_2O (d) H_2O_2

(ii) Like sulphur, oxygen is not able to show +4 and +6 oxidation states because

(a) oxygen is a gas while sulphur is a solid
(b) sulphur has high ionisation enthalpy as compared to oxygen
(c) oxygen has no d-orbitals in its valence shell
(d) oxygen has high electron affinity as compared to sulphur.

(iii) Oxidation state of sulphur in $Na_2S_4O_6$

(a) 7/2 (b) 5/2 (c) 1/2 (d) 3/2

(iv) The oxidation states of sulphur in S_8, SO_3 and H_2S are respectively

(a) 0, +6 and -2 (b) +6,0 and -2 (c) -2,0 and +6 (d) +2, +6 and -2

45) **Read the passage given below and answer the following questions:** 4

Nitric acid reacts with most of the metals (except noble metals like gold and platinum) and non-metals. Towards its reaction with metals, HNO_3 acts as an acid as well as an oxidising agent. Like other acids, HNO_3 liberate nascent hydrogen from metals which further reduces the nitric acid into number of products like NO, NO_2, N_2O or NH_3. The different stages of reduction of nitric acid are:

$$\mathrm{HNO_3} \xrightarrow{+e^-} \mathrm{NO_2} \xrightarrow{+4} \xrightarrow{+2e^-} \mathrm{NO} \xrightarrow[\mathrm{NaOH}]{+2^-} \overset{+1}{\mathrm{N_2O}} \xrightarrow{+4e^-} \overset{-3}{\mathrm{NH_3}}$$

The product of the reduction of HNO_3 depends upon the nature of the metal, concentration of nitric acid and temperature.

The following questions are multiple choice questions. Choose the most appropriate answer :

(i) Which of the following reactions Is used to prepare laughing gas?

(a) $\mathrm{Pb} + \text{ dil. } \mathrm{HNO_3} \longrightarrow$ **(b)** $\mathrm{Hg} + \text{ dil. } \mathrm{HNO_3} \longrightarrow$

(c) $\mathrm{Zn} + \text{dil. } \mathrm{HNO_2} \longrightarrow$ **(d)** $\mathrm{Cu} + \text{ dil. } \mathrm{HNO_3} \longrightarrow$

(ii) Gold and platinum does not dissolve in HN03 but soluble in 1 : 3 mixture of HNO_3 and HCI due to the formation of respectively

(a) $Au(NO_3)_2$, $[Pt(NO_3)_2]$ **(b) $H[AuCl_4]$, $H_2[PtCl_6]$**

(c) $[AuCl_6]^{2-}$, $[PtCl_2]^{2-}$ **(d) $[Au(NO_3)_4]^+$, $[Pt(NO_3)6]^{2-}$**

(iii) Identify B in the following reaction.

$$\mathrm{Cu} + \mathrm{HNO_{3(\text{ conc. })}} \rightarrow (A) + (B) + \mathrm{H_2O}$$

Deep blue colour Gas

(a) NO_2 **(b) N_2** **(c) NO** **(d) N_2O**

(iv) In which of the following reactions HN03 will not act as an oxidising agent?

(a) $\mathrm{HNO_3} + \mathrm{H_2SO_4} \rightarrow$ **(b)** $\mathrm{HNO_3} + \mathrm{FeSO_4} + \mathrm{H_2SO_4} \rightarrow$

(c) $\mathrm{KI} + \mathrm{HNO_3} \rightarrow$ **(d)** $\mathrm{Au} + \mathrm{HNO_3} \rightarrow$

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1) (d) N 1

2) (a) NH_4NO_3 1

3) (a) N 1

4) (a) White P 1

5) (a) H_3PO_3 is dibasic and reducing 1

6) (d) PH_3, AsH_3, NH_3 1

7) (a) 6,6 1

8) (d) NF_3 1

9) (d) 0,+1 and -2 1

10) (c) O< S< F< Cl 1

11) (b) C 1

12) (b) Hg 1

13) (d) $S_2O_7^{2-}$ 1

14) (b) KHF_2 1

15) (b) HI 1

16) (d) none of these 1

17) (d) HCl and $HClO_3$ 1

18) (a) $F_2 > Cl_2 > Br_2 > I_2$; Bond dissociation energy 1

19) (a) Cl_2 1

20) (c) N_2 1

21) (c) O_2 and Xe have comparable ionisation energies 1

22) (a) 3,2,1,0 1

23) (a) H_2SO_4 reduces HI to I_2 1

24) (b) deep blue solution of $[Cu(NH_3)_4]^{2+}$ 1

25) (a) 3 double bonds ; 9 single bonds 1

26) (c) Phosphorus 1

27) (a) CO_3^{2-}, NO_3^- 1

28) (a) HF 1

29) (d) It is less basic than NH_3 1

30) (c) H_3PO_4 1

31) (c) Presence of One -OH group and two P-H bonds 1

32) (b) NO_2 ,PbO 1

33) (a) $[Fe(H_2O)_5(NO)]^{2+}$ 1

34) (b) BiF_5 1

35) (a) N_2 in both cases 1

36) (a) 2 1

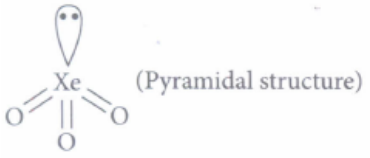
37) (c) +1 1

38) (c) SF_4 1

39) (c) $H_2S_2O_7$ and $H_2S_2O_8$ 1

40) (c) C 1

41) **(i) (b)** 4
(ii) (b) :



(iii) (c)
(iv) (d) : $\mathrm{XeO_3} \Rightarrow x + (-2) \times 3 = 0 \Rightarrow x = +6$

42) 4
(i) (a) : Thermal stability decreases as the size difference or the electronegativity difference between the two halogen atoms decreases.
(ii) (b) : $[ICl_2]^-$ - linear, ClF_3 - T-shaped, $[BrF_4]^-$ - Square planar
(iii) (b): It has square pyramidal shape and has 5 bond pairs and one lone pair.
(iv) (c) : In IF_7, iodine is the least electronegative halogen, so its highest oxidation number (+7) is more stable than those of the lighter member of the group.

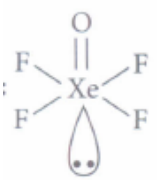
43) 4

(i) (d)

(d) : XeF_6 has sp^3d^3 hybridisation and distorted octahedral shape

(ii) (d) : Xe has completely filled 5p -orbital. As a result, when it undergoes bonding with an odd number (1, 3 or 5) of fluorine atoms, it leaves behind one unpaired electron. This causes the molecule to become unstable. As a result, XeF, XeF_3 and XeF_5 do not exist.

(iii) (b):



(iv) (b) : XeF_2 has 3 lone pairs on Xe atom.

44) 4

(i) (a) : As fluorine is more electronegative than oxygen, so, oxygen exhibits +2 oxidation state in OF_2.

(c) : In SO_2 sulphur having +4 oxidation state, so it can lose its two more electrons to attain +6 oxidation state. It can gain electrons to attain its lowest oxidation state of -2. Therefore, it can behave as both reducing and oxidising agent.

(iii) (b) : $\mathrm{Na_2\ S_4O_6} \Rightarrow 2(+1) + 4x + 6(-2) = 0 \Rightarrow x = 5/2$

(iv) (a)

45) 4

(i) (c) : $4\mathrm{Zn} + 10\mathrm{HNO_3} \rightarrow 4\mathrm{Zn(NO_3)_2} + 5\mathrm{H_2O} + \underset{\text{Laughing gas}}{\mathrm{N_2O}}$

(ii) (b) : $\mathrm{Au} + 3[\mathrm{Cl}] \rightarrow \mathrm{AuCl_3} \xrightarrow{\mathrm{HCl}} \mathrm{H}\,[\mathrm{AuCl_4}]$

From aqua regia

$\mathrm{Pt} + 4[\mathrm{Cl}] \rightarrow \mathrm{PtCl_4} \xrightarrow{\mathrm{HCl}} \mathrm{H_2}\,[\mathrm{PtCl_6}]$

From aqua regia

(iii) (a) : $\mathrm{Cu} + 4\mathrm{HNO_{3(\ conc.\ )}} \rightarrow \mathrm{Cu(NO_3)_2} + 2\mathrm{NO_2} + 2\mathrm{H_2O}(A)(B)$

(iv) (a) : $\mathrm{HNO_3} + \mathrm{H_2SO_4} \longrightarrow \mathrm{NO_2^+} + \mathrm{HSO_4^-} + \mathrm{H_2O}$

In this reaction HNO_3 is acting as OH^- donor and H_2SO_4 as H^+ donor. This is not a redox reaction.