NEET UG (2024)
Chemistry
Quiz-7

SECTION - A

51. The relative abundance of two isotopes of atomic masses 85 and 87 are 75% and 25% respectively. The average atomic mass of element is:
(1) 86 u (2) 40 u
(3) 85.5 u (4) 75.5 u

52. Total number of atoms present in 25 mg of camphor, $C_{10}H_{16}O$ (Molar mass = 152 g/mol) is
(1) 2.57×10^{21} (2) 9.89×10^{19}
(3) 2.67×10^{21} (4) 6.02×10^{20}

53. An oxide of iodine (I = 127) contains 25.4 g of iodine and 8 g of oxygen. Its formula could be:
(1) I_2O_3 (2) I_2O
(3) I_2O_5 (4) I_2O_7

54. The ratio of volume occupied by 1 mole O_2 and 1 mole CO_2 under identical conditions of temperature and pressure is:
(1) 1 : 1 (2) 1 : 2
(3) 1 : 3 (4) 2 : 1

55. Common salt obtained from sea-water contains 95% NaCl by mass. The approximate number of molecules present in 10 g salt is:
(Molar mass of NaCl = 58.5 g mo1^{-1})
(1) 10^{21} (2) 10^{22}
(3) 10^{23} (4) 10^{24}

56. The decomposition of a certain mass of $CaCO_3$ gave 11.2 dm^3 of CO_2 gas at STP. The mass of KOH required to completely neutralise the gas is: (Molar mass of KOH = 56 g / mol)

$$2KOH + CO_2 \longrightarrow K_2CO_3 + H_2O$$

(1) 56 g (2) 28 g
(3) 42 g (4) 20 g

57. Equal volumes of different gases at any definite temperature and pressure have:
(1) Equal weights
(2) Equal masses
(3) Equal densities
(4) Equal number of moles

58. 19.7 kg of gold was recovered from a smuggler. The atoms of gold recovered are: (Au = 197)
(1) 100 (2) 6.02×10^{23}
(3) 6.02×10^{24} (4) 6.02×10^{25}

59. The largest number of molecules is in:
(Molar mass of CO, C_2H_5OH, H_2O and N_2O_5 are 28, 46, 18 108 g mol^{-1} respectively)
(1) 28 g of CO (2) 46 g of C_2H_5OH
(3) 36 g of H_2O (4) 54 g of N_2O_5

60. Number of atoms in 4.25 g of NH_3 is:
(Molar mass of NH_3 = 17 g/mol)
(1) 6.023×10^{23} (2) $4\times6.023\times10^{23}$
(3) 1.7×10^{24} (4) $4.5\times6.023\times10^{23}$

61. Number of molecules in 1 litre of oxygen at NTP is:
(1) $\frac{6.02\times10^{23}}{32}$ (2) $\frac{6.02\times10^{23}}{22.4}$
(3) 32×22.4 (4) $\frac{32}{22.4}$

62. Which of the following has least electron affinity?
(1) O (2) Ne
(3) N (4) Be

63. The correct order of ionization energy of C, N, O, F is:
(1) F < N < C < O (2) C < N < O < F
(3) C < O < N < F (4) F < O < N < C

64. Chloride ion and potassium ion are isoelectronic. Then:
(1) Their sizes are same
(2) Cl^- ion is bigger than K^+ ion
(3) K^+ ion is relatively bigger
(4) Their sizes depend on other cation and anion

65. According to modern periodic law, variations in the properties of elements is related to their:
(1) Atomic weights
(2) Nuclear weights
(3) Atomic numbers
(4) Neutron-proton ratios

66. Correct order of adjacent bond angle is
(1) $NO_2^- > NO_3^-$
(2) $NO_2^+ < SO_2$
(3) $CO_2 > SO_2$
(4) $ICl_4^- > ICl_2^-$

67. Which has largest atomic size?

(1) Al (2) Al^{2+}

(3) Al^{3+} (4) Al^{+}

68. Maximum bond angle is present in

(1) SO_4^{2-} (2) I_3^+

(3) I_3^- (4) NH_2^-

69. Correct order of bond strength is

(1) $F_2 > Cl_2 > Br_2 > I_2$

(2) $Cl_2 > Br_2 > F_2 > I_2$

(3) $Cl_2 > F_2 > Br_2 > I_2$

(4) $F_2 < Cl_2 < Br_2 < I_2$

70. Which one of the following is acidic?

(1) SiO_2 (2) Na_2O

(3) MgO (4) CaO

71. Incorrect order of bond energy is:

(1) N – N > P – P (2) O – O < S – S

(3) C – C > N – N (4) C – C > Si – Si

72. The most electropositive element is:

(1) Cs (2) Ga

(3) Li (4) Pb

73. The correct decreasing order of atomic size among the following species is:

K^+, Cl^-, S^{2-}, Ca^{2+}

(1) $Ca^{2+} > K^+ > Cl^- > S^{2-}$

(2) $K^+ > Ca^{2+} > Cl^- > S^{2-}$

(3) $S^{2-} > Cl^- > K^+ > Ca^{2+}$

(4) $S^{2-} > Cl^- > Ca^{2+} > K^+$

74. The formal charge on the central oxygen atom in O_3 molecule is:

(1) 0 (2) +1

(3) –1 (4) –2

75. Number of bonding pairs and lone pairs respectively around the central atom in the I_3^- ion are:

(1) 2, 2 (2) 3, 2

(3) 2, 3 (4) 4, 3

76. Which of the following sets of species does not follow octet rule?

(1) CO, PCl_5, PCl_3, $AlCl_3$

(2) CO, CCl_4, NH_3, H_2O

(3) $AlCl_3$, BF_3, PCl_5, SF_6

(4) H_2O, CCl_4, CO_2, $AlCl_3$

77. Which of the following combination of orbitals will give π-bond (Internuclear axis = z)

(1) $s + p_z$ (2) $p_z + p_z$

(3) $p_x + p_y$ (4) $p_y + p_y$

78. Match the following:

List–I (Molecule)		List –II (Number of lone pairs on central atom)	
(A)	NH_3	(i)	Two
(B)	H_2O	(ii)	Three
(C)	XeF_2	(iii)	Zero
(D)	CH_4	(iv)	Four
		(v)	One

The correct answer is:

	(A)	(B)	(C)	(D)
(1)	(v)	(ii)	(iii)	(i)
(2)	(iii)	(i)	(ii)	(v)
(3)	(v)	(i)	(ii)	(iii)
(4)	(i)	(v)	(iii)	(iv)

79. Which one of the following has coordinate bond?

(1) NaCl (2) Cl_2

(3) NH_4Cl (4) $AlCl_3$

80. Which of the following species is non planar?

(1) BF_3 (2) XeF_4

(3) SO_3 (4) SF_4

81. In which of the following species right angles are absent?

(1) BrF_3 (2) PCl_5

(3) SF_6 (4) IF_7

82. The hybridization of I in ICl_2^+ is:

(1) sp (2) sp^2

(3) sp^3 (4) dsp^2

83. The bond order of C–O bond for CO_3^{2-} ion is:

(1) 1.25 (2) 1.33

(3) 1.5 (4) 1.0

84. Which of the following compound of N is formed in its 1st excited state?

(1) NCl_3 (2) NF_3

(3) NH_3 (4) None of these

85. Which of the following is not isostructural with $SiCl_4$?

(1) PO_4^{3-} (2) NH_4^+

(3) SF_4 (4) SO_4^{2-}

SECTION-B

86. **Statement-I**: Avogadro's number is a dimensionless quantity.

Statement-II: It is a number of atoms or molecules in one mole.

(1) Statement –I is true; statement -II is true; statement –II is a correct explanation for statement –I.

(2) Statement –I is true; statement –II is true; statement –II is not a correct explanation for statement –I.

(3) Statement –I is true; statement –II is false.

(4) Statement –I is false; statement –II is true.

87. Match the following list and select the correct answer.

List -I		List –II	
(A)	$1s^2, 2s^22p^6, 3s^23p^6,4s^1$	(P)	d-block element
(B)	$1s^2, 2s^22p^6, 3s^23p^6$	(Q)	Halogen
(C)	$1s^2, 2s^2 2p^6, 3s^23p^6 3d^6, 4s^2$	(R)	Alkali metal
(D)	$1s^2, 2s^2 2p^5$	(S)	Noble gas

	(A)	(B)	(C)	(D)
(1)	P	Q	R	S
(2)	R	S	P	Q
(3)	P	R	Q	Q
(4)	Q	S	R	P

88. Fluorine reacts with uranium to form UF_6.

$$U(s)+3F_2(g)\longrightarrow UF_6(g)$$

How many fluorine molecules are required to produce 2 mg of UF_6 from an excess of uranium? The molar mass of UF_6 is 352 g mol^{-1}

(1) 3.4×10^{18} (2) 1×10^{19}

(3) 2×10^{19} (4) 3.4×10^{21}

89. A metal oxide has the formula M_2O_3. It can be reduced by H_2 to give free metal and water. 0.1596 g of M_2O_3 required 6 mg of H_2 for complete reduction. The atomic mass of the metal is:

$$M_2O_3+3H_2\longrightarrow 2M+3H_2O$$

(1) 27.9 u

(2) 79.8 u

(3) 55.8 u

(4) 159.8 u

90. 4.4 g of CO_2 and 2.24 litre of H_2 at STP are mixed in a container. The total number of molecules present in the container will be:

(Molar mass of CO_2 = 44 g mol^{-1})

(1) 6.022×10^{23} (2) 1.2044×10^{23}

(3) 6.023×10^{26} (4) 6.023×10^{24}

91. Non existing species is/are

(1) AlF_6^{3-}

(2) BF_4^-

(3) BF_6^{3-}

(4) Both (1) and (3)

92. Which of the following has both $p_\pi - p_\pi$ and $p_\pi - d_\pi$ bonds?

(1) NO_3^- (2) SO_3

(3) CO_3^{2-} (4) SO_4^{2-}

93. Elements in the same vertical group of the periodic table have generally the same:

(1) Atomic number

(2) Electronic configuration

(3) Atomic mass

(4) Number of electrons in the outermost shell of their atoms

94. The first (IE_1) and second (IE_2) ionization energies (kJ mol^{-1}) of a few elements are shown below:

	IE_1	IE_2
(A)	2372	5251
(B)	520	7300
(C)	900	1760
(D)	1680	3380

Which of the above elements is likely to be a noble gas?

(1) (A) (2) (B)

(3) (C) (4) (D)

95. Which type of shape is not possible with sp^3d hybridisation?

(1) See-saw (2) Linear

(3) Triangular planar (4) Bent-T

96. In which of the following species d_{z^2} type of orbital participate in hybridisation?

(1) SF_4 (2) XeF_4

(3) PCl_5 (4) All of these

97. The species having pyramidal shape is:

(1) SO_2

(2) BrF_3

(3) BCl_3

(4) $SOCl_2$

98. Shape and hybridization of IF_5 respectively are:
(1) Trigonal bipyramidal, sp^3d
(2) See-saw, sp^3d
(3) Square pyramidal sp^3d^2
(4) Pentagonal pyramidal, sp^3d^2

99. Which of the following has a tetrahedral geometry?
(1) $CHCl_3$ (2) SF_4
(3) XeF_4 (4) PCl_5

100. BCl_3 is a planar molecule whereas NCl_3 is pyramidal because:
(1) Nitrogen atom is smaller than boron atom
(2) BCl_3 has no lone pair of electrons whereas NCl_3 has a lone pair of electrons
(3) N–Cl bond is more covalent than B–Cl bond
(4) B–Cl bond is more polar than N–Cl bond

Solution

51. (3)

Atomic mass given: $M_1 = 85$, % = 75 (Let x)

$M_2 = 87$, % = 25 (Let y)

$\therefore$ Average atomic mass = $\frac{M_1 \times x + M_2 \times y}{x + y}$

$= \frac{85 \times 75 + 87 \times 25}{25 + 75}$

$= \frac{6375 + 2175}{100} = 85.5$

[NCERT (2021-22) Page No. 17]

52. (3)

Mass of camphor, w = 25 mg = 25×10^{-3} g

Molar mass of camphor, M = 152 g/mol

$\therefore$ Number of moles (n) = $\frac{w}{M} = \frac{25 \times 10^{-3}}{152\, g/mol}$

$= \frac{1}{6080}$ moles

Now,

1 molecule of camphor contain 27 atoms.

$\therefore$ Total number of atoms = $27 \times n \times N_A$

$= 27 \times \frac{1}{6080} \times 6.022 \times 10^{23}$

$= 2.67 \times 10^{21}$ atoms

[NCERT (2021-22) Page No. 18-19]

53. (3)

Moles of I = $\frac{mass}{molar\ mass} = \frac{25.4}{127}$ = 0.2 mole

Moles of O = $\frac{mass}{molar\ molar} = \frac{8}{16} = \frac{1}{2}$ = 0.5

ratio = 2 : 5

Thus, the formula of compound is I_2O_5

[NCERT (2021-22) Page No. 19-20]

54. (1)

From Avogadro's hypothesis, volume is directly proportional to the number of moles of gases at constant temperature & pressure.

$\therefore$ $V \propto n$ (at constant T & P), here the nature of gas is not significant, only no. of moles matters.

i.e., no matter what are gases (but it should behave ideally).

[NCERT (2021-22) Page No. 15]

55. (3)

100 g salt contains 95 g NaCl

Therefore, 10 g salt contains 9.5 g NaCl

No. of molecules = (moles of NaCl) $\times 6.02 \times 10^{23}$

$= \frac{9.5}{58.5} \times 6.02 \times 10^{23} = 10^{23}$

[NCERT (2021-22) Page No. 18-19]

56. (1)

$2KOH + CO_2 \longrightarrow K_2CO_3 + H_2O$

No. of moles of CO_2 = $\frac{11.2}{22.4}$ = 0.5 mole

1 mole of CO_2 requires 2 moles of KOH.

$\therefore$ No. of moles of KOH required = $0.5 \times 2 = 1$ mole of KOH

$\therefore$ Amount of KOH = $n_{KOH} \times M_{KOH}$

$= 1 \times 56 = 56$ g.

[NCERT (2021-22) Page No. 20-21]

57. (4)

At equal volume of different gases at any definite temperature and pressure have equal no. of particles. Hence, equal number of moles.

[NCERT (2021-22) Page No. 15]

58. (4)

The mass of gold = 19.7 kg = 19.7 ×1000 g = 19700 g.

The molar mass of gold is 197 g/mol.

The number of moles of gold = $\frac{19700\,g}{197\,g/mol}$

= 100 mol.

The number of atoms of gold = $100\times6.02\times10^{23}$

= 6.02×10^{25}.

[NCERT (2021-22) Page No. 18-19]

59. (3)

$$N=\frac{m}{M}\times N_A$$

N is the number of molecules.

m is the mass

M is the molar mass.

N_A is the Avogadro's number

(1) H_2O

$$N=\frac{m}{M}\times N_A$$

$$=\frac{36\,g}{18\,g\,mol^{-1}}\times N_A = 2 \text{ mol } N_A$$

(2) N_2O_5

$$N=\frac{m}{M}\times N_A$$

$$=\frac{54\,g}{108\ g\,mol^{-1}}\times N_A = 0.5 \text{ mol } N_A$$

(3) C_2H_5OH

$$N=\frac{m}{M}\times N_A$$

$$=\frac{46\,g}{46\,g\,mol^{-1}}\times N_A = 1 \text{ mol } N_A$$

(4) CO

$$N=\frac{m}{M}\times N_A = \frac{28\,g}{28\,g\,mol^{-1}}\times N_A$$

= 1 mol N_A

[NCERT (2021-22) Page No. 18-19]

60. (1)

Molecular weight of NH_3 = M_{NH_3} = 17

So, 4.25 g NH_3 = $\frac{6.023\times10^{23}}{17}\times4.25$

= 1.505×10^{23} number of molecules

Now number of atoms in NH_3 = 4

So, 4.25 NH_3 contain = $4\times1.505\times10^{23}$ atom

= 6.02×10^{23} atoms

[NCERT (2021-22) Page No. 18-19]

61. (2)

At NTP, 1 mole of oxygen occupies a volume of 22.4 L.

Hence, 1 L of oxygen at NTP = $\frac{1}{22.4}mol.$

The number of oxygen molecules = $\frac{1}{22.4}\times6.02\times10^{23}=\frac{6.02\times10^{23}}{22.4}$

[NCERT (2021-22) Page No. 18-19]

62. (2)

Ne has a filled valence shell and all of its orbitals are filled. As a result, it avoids losing or gaining electrons. As a result, It has the lowest electron affinity among all the given elements.

[NCERT (2021-22) Page No. 89-90]

63. (3)

In a period on moving from left to right, the ionization energy increases. This is due to increase in the effective nuclear charge. However the ionization energy of O is lower than the ionization energy of N. This is because in case of N an electron to be removed from stable half filled 2p sub-shell which requires large energy.

[NCERT (2021-22) Page No. 87-89]

64. (2)

Potassium ion is smaller because of high nuclear charge.

[NCERT (2021-22) Page No. 87]

65. (3)

According to modern periodic law, the properties of elements are a periodic function of their atomic numbers. Atomic number is the number of protons in the nucleus of an atom, which is characteristic of a chemical element and determines its place in the periodic table.

[NCERT (2021-22) Page No. 78]

66. (3)

→ CO_2 is a linear molecule having hybridization sp bond angle is 180°

→ As the Number of lone pair on central atom increases, bond angle decreases.

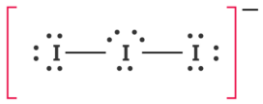
[NCERT (2021-22) Page No. 113-114]

67. (1)

A cation will always be smaller than its neutral atom. This is because, cations are formed with the loss of electrons. Hence there are a lesser number of electrons and hence greater effective nuclear attraction as a result of which the ionic radius decreases.

[NCERT (2021-22) Page No. 87]

68. (3)



Hybridization → sp^3d

Bond angle → 180^o

Shape → Linear

[NCERT (2021-22) Page No. 113-114]

69. (2)

The bond strength of $C\ell_2$, Br_2 and I_2 decreases down the group as the size of the atom increases The bond strength of F_2 is lower than those of $C\ell_2$ and Br_2 because of interelectronic repulsions present in the small atoms of F_2.

[NCERT (2021-22) Page No. 90-91]

70. (1)

On moving left to right along the period, metallic character decreases. Metallic character influences the acidic character, acidic character decreases when metallic character increases and vice-versa. Thus, SiO_2 is acidic.

[NCERT (2021-22) Page No. 85-86]

71. (1)

N–N single bond is weaker than P –P bond due to smaller size of N as compared to P. Smaller size of N leads to smaller N – N bond length. As a result, the lone pair of electrons on both the N atoms repel each other leading to instability or weakening of N–N bond. Because of larger size of P atom, P–P bond length is more and lone pair -lone repulsion between P atoms is less which makes the P–P bond stronger than N–N bond.

[NCERT (2021-22) Page No. 87-88]

72. (1)

Electropositivity can be defined as the ability of an atom to donate electrons and form positively charged ions.

Down the group electropositivity increases. Among all the elements of the periodic table, alkali metals are considered to be the most electropositive. Cesium is known to be the most electropositive stable element.

[NCERT (2021-22) Page No. 90-91]

73. (3)

The cation with the greater positive charge will have a smaller radius because of the greater attraction of the electrons to the nucleus.

Anion with the greater negative charge will have a larger radius. In this case, the net repulsion of the electrons will outweigh the nuclear charge and the ion will expand in size.

[NCERT (2021-22) Page No. 86-87]

74. (2)

Formal charge (FC) = V – L – $\frac{B}{2}$

Where,

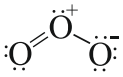
V = Total number of valence electrons in the atom.

L = Total number of nonbonding (lone pair) electrons in the atom.

B = Total number of bonding (shared) electrons in that particular atom.

Hence, the formal charge on the central O atom in O_3 is,

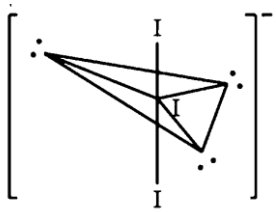
$$O_3 = 6 - 2 - \frac{1}{2} \times 6 = +1$$



[NCERT (2021-22) Page No. 104-105]

75. (3)

There are two bonding pairs and three lone pairs in the outer shell of central atom.



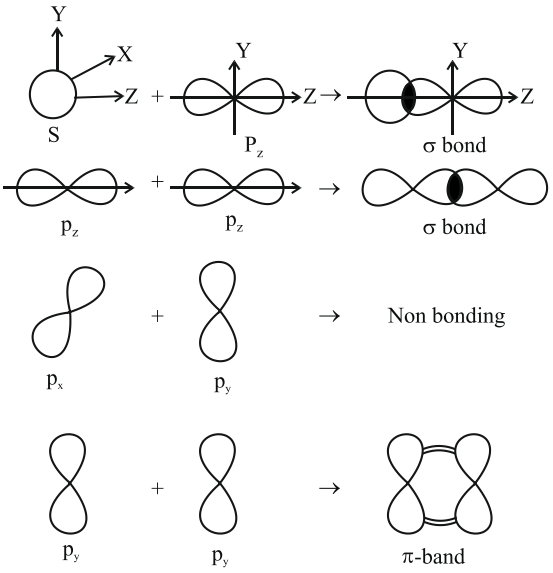
[NCERT (2021-22) Page No. 114-115]

76. (3)

BF_3, $AlCl_3$ are electron deficient molecules while in PCl_5 and SF_6 molecules P and S possess more than 8 electrons in their valence shells.

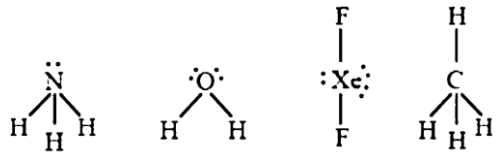
[NCERT (2021-22) Page No. 105-106]

77. (4)



[NCERT (2021-22) Page No. 119-120]

78. (3)

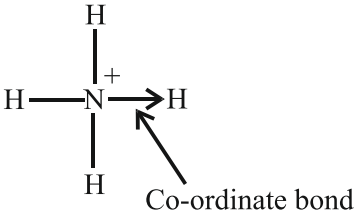


[NCERT (2021-22) Page No. 114-116]

79. (3)

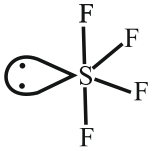
A coordinate bond is a covalent bond (a shared pair of electrons) in which both electrons comes from the same atom.

The nitrogen atom has a lone pair of electrons which are responsible for formation of coordinate covalent bond in ammonium chloride

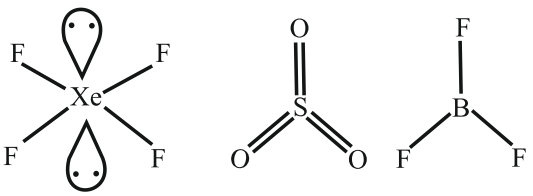


[NCERT (2021-22) Page No. 103-104]

80. (4)



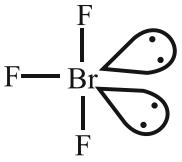
(Non-planar)



(All are planar molecules)

[NCERT (2021-22) Page No. 113-116]

81. (1)



Bond angle = 86.2º

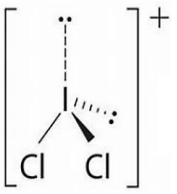
[NCERT (2021-22) Page No. 113-116]

82. (3)

$$H=\frac{1}{2}[V+M-C]=\frac{1}{2}[7+2-1]=4$$

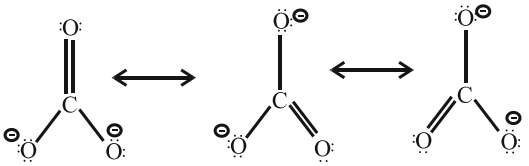
- V = number of valence electrons in central atom.
- M = number of monovalent atoms around the central atom.
- C = positive charge on cation

∴ Hybridization of I in ICl_2^+ is sp^3



[NCERT (2021-22) Page No. 121-123]

83. (2)



Bond order = $\frac{No.of\ bonds}{No.of\ \ resonating\ structures}$

$=\frac{4}{3}=1.33$

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84. (4)

All compounds are formed from ground state.

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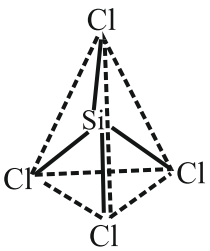
85. (3)

Isostructural Species: - Those Species which have the same shape and hybridization.

$SiCl_4$:-

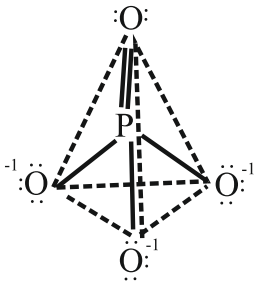


→ Bond angle = 109º

→ Tetrahedral

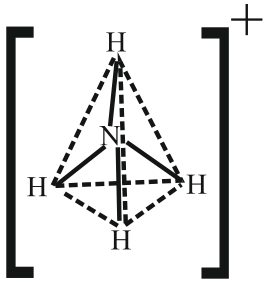
→ Hybridization = sp^3

(1) PO_4^{3-}



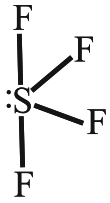
Bond angle = 109°
Tetrahedral
Hybridization = sp^3

(2) $NH_4^+ \rightarrow$



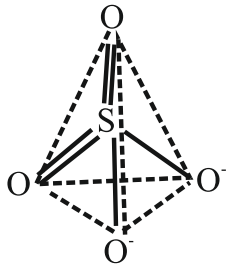
→ Tetrahedral
→ Hybridization = sp^3

(3) $SF_4 \rightarrow$



→ Due to the lone pair on sulphur atom, it has get a structure like see-saw.
hybridization – sp^3d

(4) $SO_4^{2-} \rightarrow$



→ Hybridization → sp^3
→ Tetrahedral

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86. (1)

Both statements are correct and statement -2 is the correct explanation of statement -1.

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87. (2)

$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1 \rightarrow$ Alkali metal
$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6 \rightarrow$ Noble gas
$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^6\ 4s^2 \rightarrow$ d-block element
$1s^2\ 2s^2\ 2p^5 \rightarrow$ Halogen

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88. (2)

Moles of $UF_6 = \dfrac{2\times10^{-3}}{352} = 5.68\times10^{-6}$

$U(s) + 3F_2(g) \longrightarrow UF_6(g)$
One mole UF_6 requires 3 moles of F_2
$\therefore$ moles of $F_2 = 3\times5.68\times10^{-6}$
$= 1.704\times10^{-5}$ moles
1 mole contains 6.023×10^{23} molecules
$\therefore$ 1.704×10^{-5} mole will contain
$6.023\times10^{23} \times1.704\times10^{-5}$ molecules
$= 1.026\times10^{19}$
$\approx 1\times10^{19}$

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89. (3)

$$\underset{(2x+48)g}{M_2O_3} + \underset{6g}{3H_2} \longrightarrow 2M + 3H_2O$$

x = Atomic mass of metal
$\therefore$ 0.006 g H_2 reduces 0.1596 g M_2O_3
$\therefore$ 6 g H_2 will reduce $\dfrac{0.1596}{0.006}\times6$ g M_2O_3
= 159.6 g M_2O_3
2x + 48 = 159.6
2x = 111.6
x = 55.8 u

[NCERT (2021-22) Page No. 20-21]

90. (2)

No. of moles of CO_2 in 4.4 g CO_2 = 4.4/44 = 0.1 mole
No. of moles of H_2 gas in 2.24 liters at STP
= 2. 24/22.4 = 0.1 mole
So total moles of H_2 and CO_2 gas are
= (0.1 +0.1) = 0.2 moles
Total number of Molecules in the container
$= 0.2\times6.022\times10^{23} = 1.2044\times10^{23}$

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91. (3)

Boron lacks d orbitals. Hence, it cannot have more than 8 electrons in its valence shell. Hence it cannot form BF_6^{3-}.

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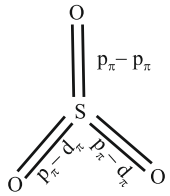
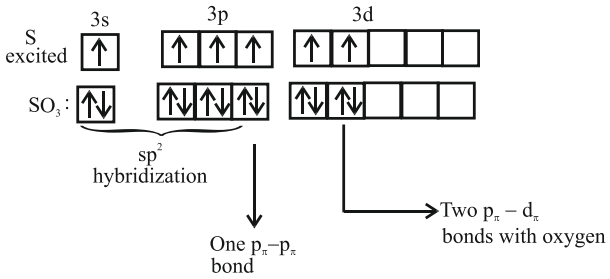
92. (2)





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93. (4)

According to the long form of the periodic table elements having similar electronic configurations of outer shell in their atoms are arranged in vertical columns, referred to as groups or families.

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94. (1)

A noble gas will have very high IE_1. Thus, (A) is a noble gas.

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95. (3)

Number of bond pairs	Number of lone pairs	Shape
4	1	See-saw
3	2	T- Shape
2	3	Linear

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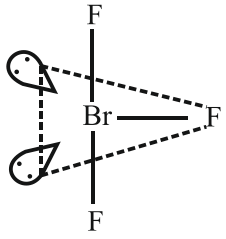
96. (4)

In All of the given species d_{z^2} types of orbital participate in hybridization

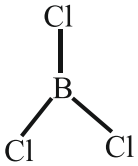
[NCERT (2021-22) Page No. 124-125]

97. (4)

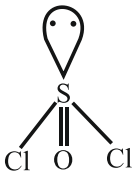
$BrF_3 \rightarrow$



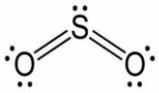
$BCl_3 \rightarrow$



$SOCl_2 \rightarrow$



$SO_2 \rightarrow$



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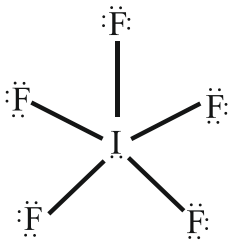
98. (3)



Shape: Square pyramidal

Hybridization: sp^3d^2

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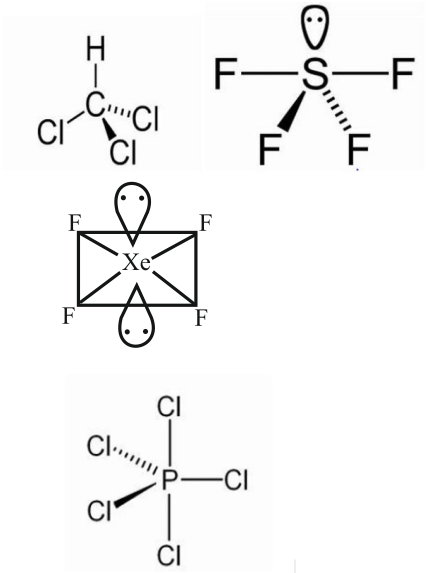
99. (1)



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100. (2)

BCl_3 has trigonal planar structure due to 3 bond pairs in the valence shell of boron whereas NCl_3 has distorted tetrahedral structure (i.e., pyramidal structure) due to one lone pair and three bond pairs in the valence shell of nitrogen.

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