*** Chemistry** **[600]**

1. Arrange the following elements in increasing order of electronegativity:
   $N, O, F, C, Si$
   Choose the correct answer from the options given below:
   (A) $Si < C < O < N < F$ (B) $O < F < N < C < Si$
   (C) $\mathrm{F < O < N < C < Si}$ (D) $Si < C < N < O < F$

   **Ans. :** d
   Electronegativity increases across the period on moving left to right. It decreases on moving down the group.
   The correct option is $\mathrm{Si < C < N < O < F}$

2. Arrange the following elements in increasing order of first ionization enthalpy:
   $\mathrm{Li, Be, B, C, N}$
   Choose the correct answer from the options given below:
   (A) $\mathrm{Li < B < Be < C < N}$
   (B) $\mathrm{Li < Be < C < B < N}$
   (C) $\mathrm{Li < Be < N < B < C}$
   (D) $\mathrm{Li < Be < B < C < N}$

   **Ans. :** a
   Increasing order of first ionization enthalpy is $\mathrm{Li < B < Be < C < N}$

| Element | First ionization enthalpy $\left(\Delta_i \mathbf{H/kJ\ mol^{-1}}\right)$ |
|---|---|
| Li | 520 |
| Be | 899 |
| B | 801 |
| C | 1086 |
| N | 1402 |

3. The $IUPAC$ name of an element with atomic number $119$ is .....
   (A) unnilennium (B) unununnium (C) ununoctium (D) ununennium

   **Ans. :** d
   $IUPAC$ nomenclature
   $119 \rightarrow$ Ununennium $\rightarrow$ Uue

4. Identify the incorrect match :

| Name | $IUPAC$ Official Name |
|---|---|
| $(a)$ Unnilunium | $(i)$ Mendelevium |
| $(b)$ Unniltrium | $(ii)$ Lawrencium |
| $(c)$ Unnilhexlum | $(iii)$ Seaborglum |
| $(d)$ Unununnium | $(iv)$ Darmstadtium |

(A) $(d),(iv)$ (B) $(a),(i)$ (C) $(b)$, $(ii)$ (D) $(c),(iii)$

**Ans. :** a

Ununnium $(Z = 111)$ it is Rontgentum (Rg) not darmstadtium.

5. For the second period elements the correct increasing order of first ionisation enthalpy is

(A) $\mathrm{Li} < \mathrm{Be} < \mathrm{B} < \mathrm{C} < \mathrm{N} < \mathrm{O} < \mathrm{F} < \mathrm{Ne}$

(B) $\mathrm{L} < \mathrm{B} < \mathrm{Be} < \mathrm{C} < \mathrm{O} < \mathrm{N} < \mathrm{F} < \mathrm{Ne}$

(C) $\mathrm{Li} < \mathrm{B} < \mathrm{Be} < \mathrm{C} < \mathrm{N} < \mathrm{O} < \mathrm{F} < \mathrm{Ne}$

(D) $\mathrm{Li} < \mathrm{Be} < \mathrm{B} < \mathrm{C} < \mathrm{O} < \mathrm{N} < \mathrm{F} < \mathrm{Ne}$

**Ans. :** b

For same shell

$\left[s^1 < p^1 < s^2 < p^2 < p^4 < p^3 < p^5 < p^6\right]$

$B < Be < C < O < N < F < Ne$

6. The element $Z = 114$ has been discovered recently. It will belong to which of the following family/group and electronic configuration?

(A) Carbon family, $[Rn]\ 5f^{14}\ 6d^{10}\ 7s^2\ 7p^2$

(B) Oxygen family, $[Rn]\ 5f^{14}\ 6d^{10}\ 7s^2\ 7p^4$

(C) Nitrogen family, $[Rn]\ 5f^{14}\ 6d^{10}\ 7s^2\ 7p^6$

(D) Halogen family, $[Rn]\ 5f^{14}\ 6d^{10}\ 7s^2\ 7p^5$

**Ans. :** a

$Z = 114[\mathrm{Rn}]^{86}7\mathrm{s}^2 5\mathrm{f}^{14}6\mathrm{d}^{10}7\mathrm{p}^2$

$14^{\mathrm{th}}\ \mathrm{gp.}$ (carbon family)

7. In which of the following options the order of arrangement does not agree with the variation of property indicated against it ?

(A) $I < Br < Cl < F$ (increasing electron gain enthalpy)

(B) $Li < Na < K < Rb$ (increasing metallic radius)

(C) $B < C < N < O$ (increasing first ionisation enthalpy)

(D) Both $(a)$ and $(c)$

**Ans. :** d

The correct order of increasing negative electron gain enthalpy is: $I < Br < F < C$

and the correct order of increasing first ionisation enthalpy is $B < C < O < N$

8. The process requiring the absorptionof energy is

(A) $F \rightarrow F^-$ (B) $H \rightarrow H^-$ (C) $Cl \rightarrow Cl^-$ (D) $O \rightarrow O^{2-}$

**Ans. :** d

Second electron affinity is zero for an element since already added electron repels existing electrons. Hence, it becomes difficult for an atom to take up another electron.

Therefore, the process $O^- \rightarrow O^{2-}$ requires energy.

9. In which of the following process, energy is liberated :-

(A) $Cl \rightarrow Cl^+ + e^-$ (B) $HCl \rightarrow H^+ + Cl^-$

(C) $Cl + e \rightarrow Cl^-$ (D) $O^- + e \rightarrow O^{2-}$

**Ans. :** c

$Cl + e^- \longrightarrow Cl^-$

octet complete

enengy is releared

$\longrightarrow$

known as electron gain enthalpy

10. Select the process in which least enthalpy change is associated :

(A) $O_{(g)} \rightarrow O^+_{(g)}$ (B) $O_{(g)} \rightarrow O^-_{(g)}$ (C) $O^+_{(g)} \rightarrow O^{2+}_{(g)}$ (D) $S_{(g)} \rightarrow S^-_{(g)}$

**Ans. :** (B) $O_{(g)} \rightarrow O^-_{(g)}$

11. The first four ionisation energy values of an element are $191, 578, 872$ and $5962\, kcal$.The number of valence electron in the element is :-

(A) $1$ (B) $2$ (C) $3$ (D) $4$

**Ans. :** c

From ionization energies it can be seen that, difference between $IE_3$ and $IE_4$ is much larger so this element have three valence electron.

12. Largest in size out of $Na^+, Ne$ and $F^-$ is

(A) $Na^+$ (B) $F^-$ (C) $Ne$ (D) all are equal

**Ans. :** b

$F^-$is the biggest in size. As we know that when we go right in a period atoms become smaller in size because no of orbit is not changing ,no of proton is increasing ,no of electron is increasing so that attraction between protons and electrons will increase so the size will decrease.

In $F^-$, no of electrons is more than no of protons so that protons can 't attract electrons very heavily. In $Na^+$no of electrons is less than no of protons so that protons will attract electrons more heavily thus its size will decrease. Ne has the same no of electrons and protons. $F^- > Ne > Na^+$ will be the order.

13. Ionic sizes increase in the order :-

(A) $Ca^{2+} < Cl^- < S^{2-} < Ar$

(B) $Ar < Ca^{2+} < Cl^- < S^{2-}$

(C) $Cl^- < Ca^{2+} < Ar < S^{2-}$

(D) $S^{2-} < Cl^- < Ca^{2+} < Ar$

**Ans.:** (A) $Ca^{2+} < Cl^- < S^{2-} < Ar$

14. Increasing order of atomic radii is

(A) $Mg^{2+} < Na^+ < Ne < F^- < O^{2-}$

(B) $Na^+ < Mg^{++} < Ne < F^- < O^{2-}$

(C) $O^{2-} < F^- < Ne < Na^+ < Mg^{2+}$

(D) $Ne < O^{2-} < F^- < Na^+ < Mg^{2+}$

**Ans. :** a

All the species are iso-electronic $(10e^-)$

For iso-electronic species more the positive change, smaller the ionic radii.

For iso-electronic species more negative change, bigger the ionic radii

Hence the order is $Mg^{2+} < Na^+ < F^- < O^{2-}$

15. In the isoelectronic species the ionic radii $\overset{o}{A}$ of $N^{3-}, O^{2-}$ and $F^-$ are respectively given by :-

(A) $1.36, 1.40, 1.71$ (B) $1.36, 1.71, 1.40$ (C) $1.71, 1.40, 1.36$ (D) $1.71, 1.36, 1.40$

**Ans. :** (C) $1.71, 1.40, 1.36$

16. In $K^+F^-$ ionic radius of $F^-$ is more while atomic radius of $K^+$ is

(A) Less than $F^-$ (B) More than $F^-$ (C) Equal of $F^-$ (D) None of these

**Ans. :** b

(b) More than $F^-$ as $K^+$ has more no of shells in atomic state.

17. From the given set of species, point out the species from each set having least atomic radius

$(A)\, F^-, Na^+, Mg^{+2}$ $(B)\, Ni, Cu, Zn$

$(C)\, N^{-3}, Cs^+, H^-$ $(D)\, Li, He, Be^{+2}$

(A) $Mg^{+2}, Ni, N^{-3}, Be^{+2}$ (B) $Na^+, Cu, Cr^+, Li$

(C) $F^-, Cu, N^{-3}, He$

(D) $Na^+, Ni, H^-, He$

**Ans.:** (A) $Mg^{+2}, Ni, N^{-3}, Be^{+2}$

18. For valence shell of $Na$ screening by

(A) $1s$ orbital (B) $2s$ orbital (C) $2p$ orbital (D) All

**Ans. :** d

Because for valence shell screening by all inner electrons.

$\therefore\ 1s^2\ 2s^2\ 2p^6\ 3s^2$

19. If $Z_{eff}$ of boron is $x$ then $Z_{eff}$ of oxygen will be

(A) $x - 0.65$ (B) $x + 0.65$ (C) $x + 1.30$ (D) $x + 1.95$

**Ans. :** d

Atomic number of Boron $= 5$

Electronic configuration of Boron $= 1522522P1$

Effective nuclear charge of boron Zeff $= 5 - 2 \times 0.35 + 2 \times 0.85 = 2.6$

Atomic number of Oxygen $= 8$

Electronic configuration of Oxygen $= 1522522P4$

Effective nuclear charge of oxygen Zeff $= 8 - 5 \times 0.35 + 2 \times 0.85 = 4.55$

Effective nuclear charge of oxygen can be rewritten as $2.6 + 1.95 = 4.55$

Consider Zeff of boron as $'X$ ', then Zeff of Oxygen is $\circ X + 1.95'$

20. $Z_{eff}$ of $B$ is $2.6$, then value of zeff of oxygen and fluorine will be :-

(A) $8, 9$ (B) $3.45, 3.8$ (C) $4.55, 5.20$ (D) none

**Ans. :** c

The expression for the effective nuclear charge $Z^*$ is

$Z^* = Z - S$

Here, $Z$ is the nuclear charge and $S$ is the shielding constant.

For oxygen $Z = 8$ and $S = 3.45 = 2 \times 0.85 + 5 \times 0.35$

Hence, $Z^* = Z - S = 8 - 3.45 = 4.55$

Hence, the effective nuclear charge for oxygen atom is $4.55$.

Flourine $= 9 - 6 \times 0.35 - 2 \times 0.85$

$= 5 \cdot 2$

21. In which pair first element has more $Z_{eff}$ than second atom ?

(A) $Be, B$ (B) $C, N$ (C) $Na, K$ (D) $F, O$

**Ans. :** d

$Z_{eff}$

$_8\mathrm{O} = 3.9$

$_9\mathrm{F} = 4.55$

22. No. of electron in penultimate shell of $d-$ block elements

(A) $9 - 18$ (B) $19 - 32$ (C) $1 - 10$ (D) $9 - 32$

**Ans. :** a

$(\mathrm{n}-1)\mathrm{s}^2\mathrm{p}^6\mathrm{d}^{1-10}\mathrm{ns}^{0-2}$

(Penultimate) $= n - 1$ shell

$\Rightarrow \quad 9 \quad - \quad 19$

Lower Higher

23. Total number of $d$ electrons present an element with atomic no. $78$ is

(A) $8$ (B) $58$ (C) $28$ (D) $29$

**Ans. :** d

$_{78}Pt = 3d^{10} + 4d^{10} + 5d^{9} = 29\, e^{-1}s$

24. Incorrect match ?

| $I.P.$ | Reason |
|---|---|
| $(A)\ N > O$ | Half filled configuration |
| $(B)\ Zr < Hf$ | Lanthenide contraction |
| $(C)\ Na > K$ | $Z_{eff}$ |
| $(D)\ Al < Ga$ | Transition contraction |

(A) only $A$ (B) $A, B, D$ (C) Only $C$ (D) Only $C, D$

**Ans. :** (C) Only $C$

25. Consider the following information about element $P$ and $Q$

| | Period number | Group number |
|---|---|---|
| $Q$ | $2$ | $15$ |
| $P$ | $3$ | $2$ |

Then formula of the compound formed by $P$ and $Q$ element is

(A) $PQ$ (B) $P_3Q_2$ (C) $P_2Q_3$ (D) $PQ_2$

**Ans. :** b

$P$ is trivalent non-metal $Q$ is divalent metal hence formula of the compound is $P_2Q_3$

26. The electronic configuration of three elements $A, B$ and $C$ are given below. The molecular formula of the compound formed from $B$ and $C$ will be

$A : 1s^2\ 2s^2\ 2p^6$

$B : 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$

$C : 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$

(A) $BC$ (B) $B_2C$ (C) $BC_2$ (D) $BC_3$

**Ans. :** d

$B$ represents phosphorus $P$ and $C$ represents Chlorine $Cl$. The compound formed is $PCl_3$ i.e., $BC_3$.

27. $La$ (lanthanum) having atomic number $57$ is a member of

(A) $s-$ block elements (B) $p-$ block elements

(C) $d-$ block elements (D) $f-$ block elements

**Ans. :** (C) $d-$ block elements

28. Which electronic configuration must represent an atom in an excited state?

(A) $1s^2, 2s^2 2p^1$ (B) $1s^2, 2s^2 2p^2$ (C) $1s^2, 2s^2 2p^2, 3s^1$ (D) $1s^2, 2s^2 2p^5$

**Ans. :** c

$(c)\ 1s^2, 2s^2 2p^2, 3s^1$ (Excited state)

29. Which of the following pair of elements belong to the same period?

(A) $Mg$ and $Sb$ (B) $Ca$ and $Zn$ (C) $Na$ and $Ca$ (D) $Ca$ and $Cl$

**Ans. :** b

Calcium and zinc both belong to the same period, i.e Period $4$

30. The period number and group number of ''Tantalum" $(Z = 73)$ are respectively

(A) $5, 7$ (B) $6, 13$ (C) $6, 5$ (D) None of these

**Ans. :** c

$(c)$

| Period number | Group number | Element |
|---|---|---|
| $5$ | $7$ | $Tc$ |
| $6$ | $13$ | $Tl$ |
| $6$ | $5$ | $Ta$ |

31. The element having electronic configuration $[Kr]4d^{10}4f^{14}, 5s^2 5p^6, 6s^2$ belongs to

(A) $s - block$ (B) $p - block$ (C) $d - block$ (D) $f - block$

**Ans. :** (D) $f - block$

32. Which of the following electronic configuration represent representative elements

(A) $ns^{1,2}\ np^{1-5}$

(B) $ns^{1,2}\ np^{0-5}$

(C) $ns^{1,2}\ np^{0-6}$

(D) $ns^{1,2}\ np^{1-6}$

**Ans. :** b

Representative elements are $s$ and $p-$ block element.

33. Species isoelectronic with $BF_3$ would be

(A) $NO_3^-$ (B) $CO_3^{-2}$ (C) $BO_3^{-3}$ (D) All the above

**Ans. :** (D) All the above

34. If the atomic number of an element is $58$, it will be placed in the periodic table in the

(A) $III\,B$ group and $6^{th}$ period

(B) $IV\,B$ group and $6^{th}$ period

(C) $V\,B$ group and $7^{th}$ period

(D) none of these

**Ans. :** a

$_{58}Ce = {}_{54}[Xe]\,4f^2\,6s^2$ $f-$ block element placed in power is $III\,B$ group.

35. If three electrons could be accomodated in an orbital, then the element with atomic no $50$ will belong to:-

(A) $4^{th}$ period and $p$ block

(B) $5^{th}$ period and $s$ block

(C) $4^{th}$ period and $d$ block

(D) $5^{th}$ period and $p$ block

**Ans.:** (A) $4^{th}$ period and $p$ block

36. An element $X$ belongs to group $16$ and $5^{th}$ period. Its atomic number is

(A) $34$ (B) $50$ (C) $52$ (D) $85$

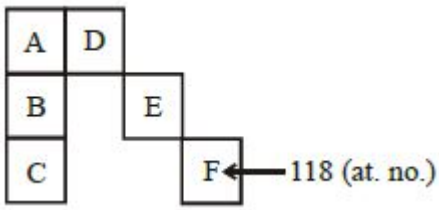
**Ans. :** (C) $52$

37. The elements having the electronic configuration $[Kr]4d^{10}\,f^{14}\,5s^2\,p^6\,d^2\,6s^2$ belongs to

(A) $s-$ block (B) $p-$ block (C) $d-$ block (D) $f-$ block

**Ans. :** (C) $d-$ block

38. Find correct one




(A) $A$ belong to $15$ group

(B) $F, B$ belong to $14$ group

(C) $B, F$ belong to same period

(D) All are incorrect

**Ans. :** a

$At.no.$

$F = 118$

$E = 85$

$D = 52$

$A = 51$

39. If $M^{+3}$ has configuration $[Ar]3d^{10}$ then $M$ belongs to :-

(A) $s-block$ (B) $p-block$ (C) $d-block$ (D) $f-block$

**Ans. :** b

$M^{+3}=[\mathrm{Ar}]3\mathrm{d}^{10}$

$M=[\mathrm{Ar}]3\mathrm{d}^{10}4\mathrm{s}^{2}4\mathrm{p}^{1}$

40. Select the elements belonging to same group from the following list :-

(A) $Z=12,38,4,88$ (B) $Z=9,16,3,35$ (C) $Z=5,11,27,19$ (D) $Z=24,47,42,55$

**Ans. :** a

option $A$ is correct .

because every period is having certain intervals such as 2,8,8,18,18,32,31 to 1 to 7 periods respectively.

so that if we add these numbers to element atomic number we can get next element of the same group.a)

$4,4+8,12+8,20+18,38+18,56+32$

41. Select the $CORRECT$ set of group number and period of element $''Uub''$ .

(A) $10,7$ (B) $12,6$ (C) $12,7$ (D) $11,7$

**Ans. :** c

$112-[Rn]$ , $7s^{2},5f^{14}$ , $6d^{10}$

42. In which block $106^{th}$ element belongs

(A) $s$-block (B) $p$-block (C) $d$-block (D) $f$-block

**Ans. :** c

(c) Element belongs to $d$-block is unnilhexium $(Unh)_{106}$.

43. The chemistry of lithium is very similar to that of magnesium even though they are placed in different groups

(A) Both are found together in nature

(B) Both have nearly the same size

(C) Both have similar electronic configuration

(D) The ratio of their charge to size is nearly the same

**Ans. :** d

A Diagonal Relationship is said to exist between certain pairs of diagonally adjacent elements in the second and third periods of the periodic table. These pairs ($Li$ and $Mg, Be$ and $Al, B$ and $Si$ etc.) exhibit similar properties; for example, Boron and Silicon are both semiconductors, form halides that are hydrolyzed in water and have acidic oxides. Such a relationship occurs because crossing and descending the periodic table have opposing effects. On crossing a period of the periodic table, the size of the atoms decreases, and on descending a group the size of the atoms increases. Similarly, on moving along the period the elements become progressively more covalent, less reducing and more electronegative, whereas on

descending the group the elements become more ionic, more basic and less electronegative. Thus, on both descending a group and crossing by one element the changes cancel each other out, and elements with similar properties which have similar chemistry are often found - the atomic size, electronegativity, properties of compounds (and so forth) of the diagonal members are similar.

The chemistry of lithium is very similar to that of magnesium even though they are placed in different groups. Its reason is that the ratio of their charge to size is nearly the same

44. Group comprising of all metals is

(A) $IIA$ (B) $IVA$ (C) $VIIA$ (D) $IIIA$

**Ans. :** a

$(d)$ In $IIA$ group all elements are metal while in $IIIA, IVA$ and $VIIA$ groups non-metallic elements are also present.

45. The elements indicating following atomic numbers belong to same group

(A) $11$ and $37$ (B) $19$ and $15$ (C) $39$ and $88$ (D) None of these

**Ans. :** a

Electronic configuration for elements with atomic number $11$ and $37$ are $[Ne]3s^1$ and $[Kr]5s^1$ respectively. Both belongs to same group (i.e. group $1$)

46. An element $M$ has an atomic mass $19$ and atomic number $9$. Its ion is represented by

(A) $M^+$ (B) $M^-$ (C) $M^{2+}$ (D) $M^{2-}$

**Ans. :** b

$(b)$ $M^-$ After gaining an $e^-$ the metal attains stable configuration.

47. Beryllium resembles much with

(A) $Zn$ (B) $Al$ (C) $Li$ (D) $Ra$

**Ans. :** b

$(b) Al$. Due to diagonal relationship.

48. Which pair of elements has same chemical properties

(A) $13, 22$ (B) $3, 11$ (C) $4, 24$ (D) $2, 4$

**Ans. :** b

$(b)$ Because they belong to same group.

49. An element has electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^4$. Predict their period, group and block

(A) Period = $3^{rd}$, block = $p$, group = $16$

(B) Period =$5^{th}$, block = $s$, group = $1$

(C) Period = $3^{rd}$, block =$p$, group = $10$

(D) Period = $4^{th}$, block = $d$, group = $12$

**Ans. :** a

$(a)$ By obserbing principal quantum number $(n)$, Orbital $(s,p,d,f)$ and equating no. of $e^-$'s we are able to find the period, block and group of element in periodic table.

50. Which of the following dinegative anion is quite common

(A) $S^{2-}$ (B) $Se^{2-}$ (C) $Te^{2-}$ (D) $O^{2-}$

**Ans. :** d

$(d)$ Due to its vacant $p$-orbital.

51. An element has the electronic configuration $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^5, 4s^1$. It is a

(A) $s$-block element (B) $p$-block element (C) $d$-block element (D) Inert gas

**Ans. :** c

$(c)$ $d$-block. As the last $e^-$ enters in $d$-subshell.

52. The heaviest atom amongst the following is

(A) $U$ (B) $Ra$ (C) $Pb$ (D) $Hg$

**Ans. :** a

$(a)$ $U > Ra > Pb > Hg$

53. The $d$-block elements consists mostly of

(A) Monovalent metals

(B) All non-metals

(C) Elements which generally form stoichiometric metal oxide

(D) Many metals with catalytic properties

**Ans. :** d

(d)Many metals with catalytic properties because

(i) They provide surface area for reaction to occur

(ii) They decreases the ionisation energy.

(iii) They have vacant $d$-orbitals.

54. In the periodic table, the element with atomic number $16$ will be placed in the group

(A) Third (B) Fourth (C) Fifth (D) Sixth

**Ans. :** d

$(d)$ 16-$1s^2 2s^2 2p^6 3s^2 3p^4$ there are $6e^-$ in outer most shell therefore its group is $VI^{th}A$.

55. Which is dobereiner's triad

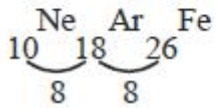
(A) $Ne, Ar, Fe$ (B) $Li, Na, Rb$ (C) $F, Cl, Br$ (D) None

**Ans. :** d

Element belongs to same group and gap between at no. 8/18.

$_{3}Li_{11}Na_{37}Rb$

$_{9}F_{17}Cl_{35}Br$




56. In Lother Meyer curve, descending position (next to peak) is held by

(A) Halogens (B) Alkaline earth metals

(C) $d-$ block elements (D) Alkali metals

**Ans. :** (B) Alkaline earth metals

57. Dobereiner traids is

(A) $Na, K, Rb$ (B) $Mg,S,As$ (C) $Cl, Br,I$ (D) $P,S,, As$

**Ans. :** c

(c) According to Dobernier law of triads the atomic mass of the central element was nearly the arithmetic mean of atomic masses of other two elements.

| $Cl$ | $Br$ | $I$ | Arithmetic mean |
|---|---|---|---|
| 31 | 75 | 120 | $\frac{120+31}{2}=75.5$ |

58. Which of the following represents the correct order of metallic character of the given elements ?

(A) $Si < Be < Mg < K$ (B) $Be < Si < Mg < K$

(C) $K < Mg < Be < Si$ (D) $Be < Si < K < Mg$

**Ans. :** a

Metallic character increases down the group and decreases along the period.

59. For elements $B,C,N,Li,Be,O$ and $F$ the correct order of first ionization enthalpy is

(A) $Li < Be < B < C < N < O < F$

(B) $B > Li > Be > C > N > O > F$

(C) $Li < B < Be < C < O < N < F$

(D) $Li < Be < B < C < O < N < F$

**Ans. :** c

First I.E.

$F > N > O > C > Be > B > Li$

$Li - 520\,kJ/mol$

$Be - 899\,kJ/mol$

$B - 801\,kJ/mol$

$C - 1086\,kJ/mol$

$N - 1402\,kJ/mol$

$O - 1314\,kJ/mol$

$F - 1681\,kJ/mol$

60. Among the following basic oxide is .....

(A) $SO_3$ (B) $SiO_2$ (C) $CaO$ (D) $Al_2O_3$

**Ans. :** c

$SO_3, SiO_2 =$ Acidic

$CaO =$ Basic

$Al_2O_3 =$ Amphoteric

61. Match List$-I$ with List$-II$.

| List$-I$ (Oxide) | List$-II$ (Nature) |
|---|---|
| $(A)\ Cl_2O_7$ | $(I)$ Amphoteric |
| $(B)\ Na_2O$ | $(II)$ Basic |
| $(C)\ Al_2O_3$ | $(III)$ Neutral |
| $(D)\ N_2O$ | $(IV)$ Acidic |

Choose the correct answer from the options given below

(A) $(A)-(IV),(B)-(III),(C)-(I),(D)-(II)$

(B) $(A)-(IV),(B)-(II),(C)-(I),(D)-(III)$

(C) $(A)-(II),(B)-(IV),(C)-(III),(D)-(I)$

(D) $(A)-(I),(B)-(II),(C)-(III),(D)-(IV)$

**Ans. :** b

$Cl_2O_7$ Acidic

$Na_2O$ Basic

$Al_2O_3$ Amphoteric

$N_2O$ Neutral

62. The $IUPAC$ nomenclature of an element with electronic configuration $[Rn]5f^{14}6d^17s^2$ is.

(A) $Unnilbium$ (B) $Unnilunium$ (C) $Unnilquadium$ (D) $Unniltrium$

**Ans. :** d

Atomic Number $103$

63. The metal that has very low melting point and its periodic position is closer to a metalloid is.

(A) $Al$ (B) $Ga$ (C) $Se$ (D) $In$

**Ans. :** b

$Al \rightarrow \quad 933\,K$
$Ga \rightarrow \quad 303\,K$
$In \rightarrow \quad 430\,K$
$Se \rightarrow \quad 490\,K$

64. Given below are the oxides:
$Na_2O, As_2O_3, N_2O, NO$ and $Cl_2O_7$
Number of amphoteric oxides is ..... .
(A) $0$ (B) $1$ (C) $2$ (D) $3$

**Ans. :** b
$Na_2O =$ Basic
$N_2O =$ Neutral
$Cl_2O_7 =$ Acidic
$As_2O_3 =$ Amphoteric
$NO =$ Neutral

65. The correct order of electron gain enthalpies of $Cl$, $F$, $Te$ and $Po$ is .....
(A) $F < Cl < Te < Po$ (B) $Cl < F < Te < Po$
(C) $Te < Po < Cl < F$ (D) $Po < Te < F < Cl$

**Ans. :** d
As $Cl$ has maximum electron affinity among all elements.

| Element | $\Delta_{eg}H(kJ/mol)$ |
|---|---|
| $F$ | $-328$ |
| $Cl$ | $-349$ |
| $Te$ | $-190$ |
| $Po$ | $-174$ |

66. The correct order of increasing ionic radii is .... .
(A) $Mg^{2+} < Na^{+} < F^{-} < O^{2-} < N^{3-}$
(B) $N^{3-} < O^{2-} < F^{-} < Na^{+} < Mg^{2+}$
(C) $F^{-} < Na^{+} < O^{2-} < Mg^{2+} < N^{3-}$
(D) $Na^{+} < F^{-} < Mg^{2+} < O^{2-} < N^{3-}$

**Ans. :** a
$N^{-3} > O^{-2} > F^{-} > Na^{+} > Mg^{+2}$( Radii )
(Isoelectronic species)

67. Which one of the following statements for $D.I.$ Mendeleeff, is incorrect?
(A) At the time, he proposed Periodic Table of elements structure of atom was known.
(B) Element with atomic number $101$ is named after him.
(C) He invented accurate barometer.

(D) He authored the textbook – Principles of Chemistry.

**Ans. :** b

At the time, he proposed the periodic table but structure of atom was unknown.

68. Match List$-I$ with List$-II$ :

| List$-I$<br>(Metal Ion) | List$-II$<br>(Group in Qualitative analysis) |
|---|---|
| $(a)$ $Mn^{2+}$ | $(i)$ Group $-III$ |
| $(b)$ $As^{3+}$ | $(ii)$ Group $-IIA$ |
| $(c)$ $Cu^{2+}$ | $(iii)$ Group $-IV$ |
| $(d)$ $Al^{3+}$ | $(iv)$ Group $-IIB$ |

Choose the most appropriate answer from the options given below :

(A) $(a)-(i),(b)-(ii),(c)-(iii),(d)-(iv)$

(B) $(a)-(iii),(b)-(iv),(c)-(ii),(d)-(i)$

(C) $(a)-(i),(b)-(iv),(c)-(ii),(d)-(iii)$

(D) $(a)-(iv),(b)-(ii),(c)-(iii),(d)-(i)$

**Ans. :** b

$\mathrm{Mn}^{2+} \rightarrow III$ group

$\mathrm{As}^{3+} \rightarrow IIB$ group

$\mathrm{Cu}^{2+} \rightarrow IIA$ group

$\mathrm{Al}^{3+} \rightarrow IV$ group

69. Which of the following halogens doesn't exhibit positive oxidation state in its compounds

(A) $Cl$ (B) $Br$ (C) $I$ (D) $F$

**Ans. :** d

Fluorine, the most electronegative element, has no positive oxidation states, but the other halogens include chlorine, bromine, and iodine commonly exhibit $+1, +3, +5$, and $+7$ states.

70. Which is the weakest base

(A) $NaOH$ (B) $KOH$ (C) $Ca(OH)_2$ (D) $Zn(OH)_2$

**Ans. :** d

It's Obvious

71. Increasing order of acid strength of halogen acid is

(A) $HF < HCl < HBr < HI$ (B) $HCl < HBr < HI < HF$

(C) $HF < HI < HBr < HCl$ (D) None of these

**Ans. :** a

(a) As going down the group size increases, an liberation of $H^+$ ion becomes easy. So the order of acidity is :

$HI > HBr > HCl > HF$

72. Which of the following oxides is most basic

(A) $Na_2O$ (B) $Al_2O_3$ (C) $SiO_2$ (D) $SO_2$

**Ans. :** a

(a) Oxides of alkali metals are most basic.

73. The most basic among these hydroxides, is

(A) $Be(OH)_2$ (B) $Mg(OH)_2$ (C) $Ca(OH)_2$ (D) $Ba(OH)_2$

**Ans. :** d

Basicity of metal hydroxide increases as we move down the group. So $Ba(OH)_2$ is most basic.

74. Strongest reducing agent is

(A) $Cl_2$ (B) $Cl^-$ (C) $Br^-$ (D) $I^-$

**Ans. :** d

(d) As it can donate $e^-$ easily due to low comparative attraction by the nucleus to the valence $e^-$.

75. Most reducing agent is

(A) $K$ (B) $Mg$ (C) $Al$ (D) $Ba$

**Ans. :** a

Reducing nature of alkali metal increase down the group due to ease of loosing electrons down the group

So, $Na < K; Mg < Ca$

Alkali metals are strong reducing agents that alkaline earthmetals. so, $K > Mg$

76. Last element of group-$IV$ is found to be

(A) Strong metallic (B) Weak metallic

(C) Strong non-metallic (D) Weak non-metallic

**Ans. :** b

Down the group metallic character increases. Group $IV$ shows variation from non-metallic character to weak metallic character as we move down the group.

77. Which is metalloid

(A) $Pb$ (B) $Sb$ (C) $Bi$ (D) $Zn$

**Ans. :** b

It's Obvious

78. Which of the following show diagonal relationship

(A) $B$ and $Si$ (B) $B$ and $Al$ (C) $B$ and $Ga$ (D) $B$ and $C$

**Ans. :** a

Boron shows diagonal relationship with silicon.

Boron shows anomalous behaviour in its groups because of its small size and non-availability of $d$-orbitals.

It resembles silicon and shows a diagonal relationship with it.

79. Chemical property of $Li$ and $Mg$ similar because

(A) These belong to same group

(B) Both ionisation potential is same

(C) Shows diagonal relationship

(D) Both electron affinity is same

**Ans. :** c

It's Obvious

80. The incorrect order is

(A) Covalent character : $PbCl_2 > CaCl_2 > SrCl_2 > BaCl_2$

(B) Thermal stability : $PbF_4 > PbCl_4 > PbBr_4 > Pbl_4$

(C) Melting point : $KF > KCl > KBr > KI$

(D) Boiling point : $CHCl_3 > CH_3Cl > CCl_4$

**Ans. :** b

Substance can acts as both oxidizing as well as reducing agent when a metal atom is present in its intermediate step.

$O_3$ can acts as only oxidizing agent due to its unstable nature and decomposes to give nascent oxygen.

$HNO_3$ : Nitrogen is present in its highest oxidation state i.e., $+5$ so it can act as only oxidizing agent.

$SO_2$ :Sulphur is present in $+4$ oxidation state so it can act as both oxidizing as well as reducing agent.

81. A compound contains three elements $A, B$ and $C$ if the oxidation number of $A = +2, B = +5$ and $C = -2$, the possible formula of the compound is

(A) $A_3(B_4C)_2$ (B) $A_3(BC_4)_2$ (C) $A_2(BC_3)_2$ (D) $ABC_2$

**Ans. :** a

Metallic character increases down the group and decreases along the period.

82. The atomic numbers of the metallic and non-metallic elements which are liquid at room temperature respectively are

(A) $55, 87$ (B) $33, 87$ (C) $35, 80$ (D) $80, 35$

**Ans. :** d

1. $MgO$ Basic

$Cl_2O$ Acidic
$Al_2O_3$ amphoteric
2. $Cl_2O$ Acidic
$CaO$ Basic
$P_4O_{10}$ Acidic
3. $Na_2O$ Basic
$SO_3$ Acidic
$Al_2O_3$ amphoteric
4. $N_2O_3$ Acidic
$Li_2O$ Basic
$Al_2O_3$ amphoteric

83. First three ionisation energies (in $kJ/mol$) of three representative elements are given below

| Element | $IE_1$ | $IE_2$ | $IE_3$ |
|---|---|---|---|
| $P$ | 495.8 | 4562 | 6910 |
| $Q$ | 737.7 | 1451 | 7733 |
| $R$ | 577.5 | 1817 | 2745 |

Then incorrect option is

(A) $Q$ : Alkaline earth metal (B) $P$ : Alkali metals

(C) $R : s-block$ element (D) They belong to same period

**Ans. :** c

$(c)\, R$ is $p-block$ element, because difference between $IE_2$ and $IE_3$ is not very high as compared to between $IE_1$ and $IE_2$; hence stable oxidation state of $R$ will be higher than $+2$.

84. Which of the following electronic configurations represents a sudden large gap between the values of second and third ionisation energies of an element?

(A) $1s^2$ , $2s^2\ 2p^3$ (B) $1s^2$ , $2s^2\ 2p^6$ , $3s^2\ 3p^3$

(C) $1s^2$ , $2s^2\ 2p^6$ , $3s^2\ 3p^1$ (D) $1s^2$ , $2s^2\ 2p^6$ , $3s^2$

**Ans. :** d

A sudden large jump between the values of second and third ionization energies of an element would be associated with electronic configuration $1s^2, 2s^2 2p^6 3s^2$ $1s^2, 2s^2 2p^6 3s^2$ looses two electrons to form $1s^2, 2s^2 2p^6$ which is stable electronic configuration of noble gas Ne. Octet is completely filled.

When third electron is to be removed, large amount of energy is required as this stable electronic configuration is to be broken.

85. For which element $[IP_2 - IP_1 < 11\, eV]$ is found

(A) $Al$ (B) $Mg$ (C) $Ar$ (D) None of these

**Ans. :** (B) $Mg$

86. The successive ionisation energy values for an element $X$ are given below element $X$ belongs to group :-

$A.1^{st}$ ionisation energy $= 410\,kJ\,mol^{-1}$

$B.2^{nd}$ ionisation energy $= 820\,kJ\,mol^{-1}$

$C.3^{rd}$ ionisation energy $= 1100\,kJ\,mol^{-1}$

$D.4^{th}$ ionisation energy $= 1500\,kJ\,mol^{-1}$

$E.5^{th}$ ionisation energy $= 3200\,kJ\,mol^{-1}$

(A) $14$ (B) $13$ (C) $15$ (D) $12$

**Ans.:** (A) $14$

87. The correct order of ionisation energy of $C, N, O, F$ is :-

(A) $F < N < C < O$ (B) $C < N < O < F$

(C) $C < O < N < F$ (D) $F < O < N < C$

**Ans. :** c

The correct order of ionization energy of $C, N, O \& F$ is \(C

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 is to be removed from stable half filled $2p$ sub-shell which requires large energy.

88. Which of the following is arranged in decreasing order of size?

(A) $Mg^{2+} > Al^{3+} > O^{2-}$ (B) $O^{2-} > Mg^{2+} > Al^{3+}$

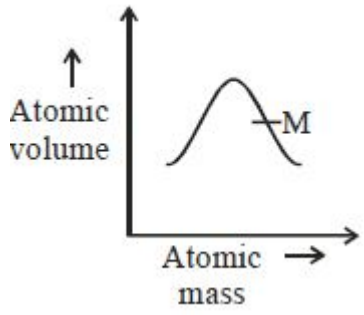
(C) $Al^{3+} > Mg^{2+} > O^{2-}$ (D) $Al^{3+} > O^{2-} > Mg^{2+}$

**Ans. :** b

Size $\propto \frac{\text{Negative charge}}{\oplus \text{ ve charge}}$

$O^{2-} > Mg^{+2} > Al^{+3}$

89. What will be the formula of $'M'$ nitrate?




(A) $M_2NO_3$ (B) $MNO_3$ (C) $M(NO_3)_2$ (D) $M(NO_2)_2$

**Ans. :** c

As per Lothar Meyer curve $= M \rightarrow A.E.M.$

$\therefore M^{+2}\, NO_3^- \Rightarrow M(NO_3)_2$

90. Incorrect order of size

(A) $Zn > Cu > Ni$ (B) $O^{-2} > F^- > Na^+$

(C) $O^{-2} > Cl^- > S^{-2}$ (D) $I^- > Br^- > Cl^-$

**Ans. :** (C) $O^{-2} > Cl^- > S^{-2}$

91. Incorrect order of ionic radius is

(A) $Na^+ > Mg^{+2} > Al^{+3}$

(B) $V^{+2} > V^{+3} > V^{+4} > V^{+5}$

(C) $K^+ > Sc^{+3} > V^{+5} > Mn^{+7}$

(D) $O^{-2} > Rb^+ > Sr^{+2} > Cs^+$

**Ans. :** d

$Cs^+ > Rb^+ > Sr^{+2} > O^{-2}$ order of Radii

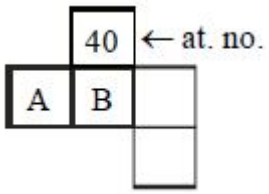
92. Correct order of ionic radius

(A) $Te^{2-} > Br^- > K^+ > Cl^-$ (B) $Te^{2-} > Br^- > Cl^- > K^+$

(C) $Br^- > Te^{2-} > Cl^- > K^+$ (D) $K^+ > Te^{2-} > Br^- > Cl^-$

**Ans. :** (B) $Te^{2-} > Br^- > Cl^- > K^+$

93. Calculate atomic number of $A$ and $B$ respectively




(A) $71, 72$ (B) $58, 72$ (C) $57, 72$ (D) $57, 71$

**Ans. :** (C) $57, 72$

94. Arrange $Ce^{3+}$, $La^{3+}$, $Pm^{3+}$, and $Yb^{+3}$ in increasing order of size

(A) $Yb^{+3} < Pm^{3+} < Ce^{3+} < La^{3+}$

(B) $Ce^{+3} < Yb^{3+} < Pm^{3+} < La^{3+}$

(C) $Yb^{+3} < Pm^{3+} < La^{3+} < Ce^{3+}$

(D) $Pm^{+3} < La^{3+} < Ce^{3+} < Yb^{3+}$

**Ans. :** a

Atomic and ionic radii of Lanthanides decrease from $La$ to $Lu$.

Their order of ionic radii: \(Y b^{+3}

95. $K^+, Cl^-, Ca^{2+}$ and $S^{2-}$, ions are isoelectronic. The decreasing order of their size is

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

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

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

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

**Ans. :** a

The decreasing order is : $S^{2-} > Cl^- > K^+ > Ca^{2+}$. Anions are larger than cations. More the negative charge more is the size.

96. The incorrect statement is / are

(A) Mendeleev's periodic law was based on atomic number of the element

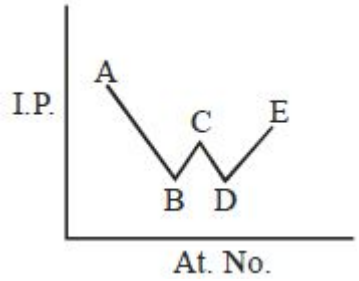
(B) Effective nuclear charge ($z_{eff}$) = atomic mass -shielding constant

(C) Mulliken's value of electronegativity of an element is about $2.8$ times lesser than the Pauling scale

(D) All of these

**Ans. :** (D) All of these

97. If $A$ to $E$ are element of a group from top to bottom then group can be




(A) $13$ group (B) $1$ group (C) $2$ group (D) Inert gas

**Ans.:** (A) $13$ group

98. Match the colum

| Column $-I$ | Column $-II$ |
|---|---|
| (Atomic number) | (Position of element in Periodic table) |
| $(A) \quad Z = 37$ | $(P) \quad p-$ block |
| $(B) \quad Z = 42$ | $(Q) \quad f-$ block |
| $(C) \quad Z = 34$ | $(R) \quad d-$ block |
| $(D) \quad Z = 92$ | $(S) \quad s-$ block |

(A) $A-P, B-Q, C-S, D-R$ (B) $A-S, B-R, C-P, D-Q$

(C) $A-P, B-Q, C-R, D-S$ (D) $A-S, B-R, C-Q, D-P$

**Ans. :** (B) $A-S, B-R, C-P, D-Q$

99. Which of the following is the incorrect match for atom of element ?

(A) $[Ar]\,3d^5\,4s^1 \rightarrow 4^{th}$ period, $6^{th}$ group

(B) $[Kr]\,4d^{10} \rightarrow 5^{th}$ period, $12^{th}$ group

(C) $[Rn]\,6d^2\,7s^2 \rightarrow 7^{th}$ period, $3^{th}$ group

(D) $[Xe]\,f^{14}\,5d^2\,6s^2 \rightarrow 6^{th}$ period, $4^{th}$ group

**Ans. :** d

$(d)$ $(a)\,[Ar]\,3d^5\,4s^1 \rightarrow Cr(24) \rightarrow 4^{th}$ period, $6^{th}$ group

$(b)\,[Kr]\,4d^{10} \rightarrow Pd(46) \rightarrow 5^{th}$ period, $12^{th}$ group

$(c)\,[Rn]\,6d^2\,7s^2 \rightarrow Th(90) \rightarrow 7^{th}$ period, $3^{rd}$ group

$(d)\,[Xe]\,4f^{14}\,5d^2\,6s^2 \rightarrow Hf(72) \rightarrow 6^{th}$ period, $4^{th}$ group

100. Which of the following sequence represents atomic number of only representative elements?

(A) $55, 12, 48, 53$ (B) $13, 33, 54, 83$ (C) $3, 33, 53, 87$ (D) $22, 33, 55, 66$

**Ans. :** c

Representative elements are the elements which lie in the group $1$ and $2$ on the far left and the last six columns or groups on the far right corner of the periodic table. Sequence $C$ option contains only representative elements.

101. Consider the following information about element $P$ and $Q$

| | Period number | Group number |
|---|---|---|
| $P$ | $2$ | $15$ |
| $Q$ | $3$ | $2$ |

Then formula of the compound formed by $P$ and $Q$ element is

(A) $PQ$ (B) $P_3Q_2$ (C) $P_2Q_3$ (D) $PQ_2$

**Ans. :** c

$(c)$ $P$ is trivalent non-metal $Q$ is divalent metal hence formula of compound is $P_2Q_3$.

102. An element whose $IUPAC$ name is ununtrium $(Uut)$ belongs to

(A) $s-block$ element (B) $p-block$ element

(C) $d-block$ element (D) Transition element

**Ans. :** b

$(b)$ Ununtrium for atomic number $= 113$; for $Z > 86\, pd.no. = 7$

$113\,[Rn]7s^2, 5f^{14}, 6d^{10}, 7p^1$

$p-block$

103. The elements with atomic number $117$ and $120$ are yet to be discovered. In which group would you place these elements when discovered ?

(A) $17,2$ (B) $16,4$ (C) $15,3$ (D) $18,2$

**Ans. :** a

Atomic number $Z = 117$

Number of protone $= 117$ Electronic configuration is $[Rn]sf^4 6d^{10} 7s^2 7p^5$

Belong to group 17 - halogen family Atomic number $= z = 120$

Electronic configuration is [440] $8s^2$ element belong to group 2 - alkali earth family

104. Match the Column $I$ with Column $II$ and select correct answer by given codes.

| Column $I$<br>(Element types) | Column $II$<br>(Electronic configuration) |
|---|---|
| $A$. Inert-gas elements | 1. $(n-1)\,d^{1-10}\,ns^{1-2}$ |
| $B$. Transition elements | 2 . $ns^2\,np^6$ |
| $C$. Inner-transition elements | 3. $(n-2)\,f^{1-14}$<br>$(n-1)\,s^2 p^6 d^{0-1}\,ns^2$ |

(A) $A-1;\ B-2,\ C-3$ (B) $A-2;\ B-1,\ C-3$

(C) $A-3;\ B-2,\ C-1$ (D) $A-2;\ B-3,\ C-1$

**Ans. :** (B) $A-2;\ B-1,\ C-3$

105. Which is correct

(A) $Z = 72 : p$ block (B) $Z = 91 : d$ block (C) $Z = 85 : f$ block (D) None

**Ans. :** d

$Z = 72 : d$ block

$Z = 91 : f$ block

$Z = 85 : p$ block

106. Which one of the following arrangements represents the correct order of electron gain enthalpy (with negative sign) of the given atomic species.

(A) $Cl < F < S < O$ (B) $O < S < F < Cl$

(C) $S < O < Cl < F$ (D) $F < Cl < O < S$

**Ans. :** b

(b) Halogens have very high electron affinity. It may be rated that the electron affinity of fluorine is unexpectedly low $(< Cl)$. This may perhaps be due to small size of $F$ atom. The value of electron gain enthalpies for $Cl, F, S$ and $O$ are respectively $349, 333, 200$ & $142 KJ/mol$ hence correct order is $Cl > F > S > O$

107. Which of the following elements shows maximum number of different oxidation states in its compounds

(A) $Eu$ (B) $La$ (C) $Gd$ (D) $Am$

**Ans. :** d

It's Obvious

108. The first ionization potentials $(eV)$ of $Be$ and $B$ respectively are

(A) $8.29\,eV$, $9.32\,eV$ (B) $9.32\,eV$, $9.32\,eV$

(C) $8.29\,eV$, $8.29\,eV$ (D) $9.32\,eV$, $8.29\,eV$

**Ans. :** d

(d) First $I.P.$ of $Be > B$ because of stable $ns^2$ configuration.

109. Which of the following does not represent the correct order of the property indicated

(A) $Sc^{3+} > Cr^{3+} > Fe^{3+} > Mn^{3+}$ ionic radii

(B) $Sc < Ti < Cr < Mn$ Density

(C) $Mn^{2+} > Ni^{2+} < Co^{2+} < Fe^{2+}$ ionic radii

(D) $FeO < CaO > MnO > CuO$ Basic nature

**Ans. :** a

(a) $Sc^{3+} > Cr^{3+} > Fe^{3+} > Mn^{3+}$ the correct order is $Cr^{+3} > Mn^{+3} > Fe^{+3} > Sc^{+3}$

110. Which of the following is largest

(A) $Cl^-$ (B) $S^{2-}$ (C) $Na^+$ (D) $F^-$

**Ans. :** b

$(b)$ $S^{2-}$ and $Cl^-$ both are isoelectronic but nuclear charge of $Cl^-$ is more than $S^{2-}$. So it has largest size.

111. The ionic radii $(\overset{o}{A})$ of $C^{4-}$ and $O^{2-}$ respectively are $2.60$ and $1.40$. The ionic radius of the isoelectronic ion $N^{3-}$ would be.....$\overset{o}{A}$

(A) $131$ (B) $2.83$ (C) $1.71$ (D) $2.63$

**Ans. :** c

$C^{4-}, N^{3-}$ and $O^{2-}$ are isoelectronic species.

The ionic radius of isoelectronic species decreases with increase in nuclear charge.

Hence, the order of ionic radius is

Species: $C^{4-} > N^{3-} > O^{2-}$

Ionic radii $(\overset{o}{A}) : 2.60 > 1.71 > 1.40$

112. The law of triads is applicable to a group of

(A) $Cl, Br, I$ (B) $C, N, O$ (C) $Na, K, Rb$ (D) $H, O, N$

**Ans. :** a

According to the law of triads the atomic $wt$ of the middle element is arithmatic mean of $I$ and $III$.

At wt of $Br = \frac{At.\,wt\,of\,Cl + At\,wt\,of\,I}{2}$

113. In which of the following arrangements, the order is $NOT$ according to the property indicated against it?

(A) $Li < Na < K < Rb$ : Increasing metallic radius

(B) $I < Br < F < Cl$ : Increasing electron gain enthalpy (with negative sign)

(C) $B < C < N < O$ Increasing first ionization enthalpy

(D) $Al^{3+} < Mg^{2+} < Na^{+} < F^{-}$ Increasing ionic size

**Ans. :** b

Electronegativity of an element depends on the atom with which it is attached.

$NO =$ neutral oxide

$Al_2O_3 =$ amphoteric oxide

114. The element with atomic number $117$ has not been discovered yet. In which family would you place this element if discovered?

(A) Alkali metals (B) Alkaline earth metals

(C) Halogens (D) Noble gases

**Ans. :** (C) Halogens

115. Which of the order for ionization energy is correct?

(A) $Be < B < C < N < O$ (B) $B < Be < C < O < N$

(C) $Be > B > C > N > O$ (D) $B < Be < N < C < O$

**Ans. :** b

The correct order for ionization energy is $B < Be < C < O < N$ .

On moving from left to right in a period, with increase in the atomic number, the ionisation enthalpy increases.

However there are few exceptions

$(1)$ Ionization energy of $B <$ ionization energy of $Be$. This is because less amount of energy is required to remove a p electron than s electron from the same principal quantum shell.

$(2)$ Ionization energy of $O <$ ionization energy of $N$.

Nitrogen has half filled $2p$ subshell which is very stable. More energy is required for removal of electron from half filled, stable subshell.

116. Consider the following statements

$I$. The radius of an anion is larger than that of the parent atom.

$II$. The ionization energy generally increases with increasing atomic number in a period.

$III$. The electronegativity of an element is the tendency of an isolated atom to attract an electron.

Which of the above statements is/are correct?

(A) $I$ alone (B) $II$ alone (C) $I$ and $II$ (D) $II$ and $III$

**Ans. :** c

$I$. The radii of an anion is larger than that of the parent atom.As the parent atom is neutral and have same number of protons and neutrons. Whereas in case of its anion, the electrons are more in number than the number of protons, so effective nuclear charge of anion, is less than that of the parent atom, hence due to lesser effective nuclear charge of the anion than that of the parent chain the size of the anion is larger than that of the parent atom.

$II$. The ionization energy generally increases with increasing atomic number in a period.

As left to right the size decreases due to increase in the atomic number (means protons), leading to increase in effective nuclear charge hence the size decreases so the ease of releasing the electrons becomes lesser, so the ionisation energy to remove the electrons increases left to right in the same period.

117. The pair of amphoteric hydroxides is

(A) $Al(OH)_3$, $LiOH$ (B) $Be(OH)_2$, $Mg(OH)_2$

(C) $B(OH)_3$, $Be(OH)_2$ (D) $Be(OH)_2$, $Zn(OH)_2$

**Ans. :** d

(d) Both $Be(OH)_2$ and $Zn(OH)_2$ are amphoteric in nature.

118. Assertion : First ionization energy for nitrogen is lower than oxygen.
Reason : Across a period effective nuclear charge decreases.

(A) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.

(B) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.

(C) If the Assertion is correct but Reason is incorrect.

(D) If both the Assertion and Reason are incorrect.

**Ans. :** d

The ionisation energy of $N$ is more than that of $O$ because $N$ has exactly half filled valence $p$ orbital. ${}_7N\ 1s^2\ 2s^2\ p^3$ ${}_8O\ 1s^2\ 2s^2\ p^4$

The nuclear charge increases across a period.

119. Spectrum of $Li^{2+}$ is similar to that of

(A) $H$ (B) $He$ (C) $Be$ (D) $Ne$

**Ans. :** a

Electronic configuration of $Li$ is $1s^2\ 2s^1$ and of $Li^{2+}$ is $1s^1$.

That is similar to the electronic configuration of $H\left(1s^1\right)$ which has only one electron in its valance shell, thus it has spectrum similar to that of $H$.

120. Which of the following ion is the smallest ion

(A) $O_2^+$ (B) $O_2^-$ (C) $O_2$ (D) $O_2^{-2}$

**Ans. :** a

(a) Cation has small size than parent atom and anion has greater size than parent atom.

121. The radii of $F$, $F^-$, $O$ and $O^{-2}$ are in the order of

(A) $O^{2-} > F^- > O > F$ (B) $O^{2-} > F^- > F > O$

(C) $F^- > O^{2-} > F > O$ (D) $O^{2-} > O > F^- > F$

**Ans. :** a

(a) Atomic radius decreases on going from left to right in a period. Thus size of $O > F$. As $O^{2-}$ and $F^-$ are isoelectronic, therefore, size of $O^{2-} > F^-$.

122. Which of the following is the most electropositive element

(A) Aluminium (B) Magnesium (C) Phosphorus (D) Sulphur

**Ans. :** b

(b) Electropositive character decreases across the period as metallic character decreases.

123. Which of the following elements are analogous to the lanthanides

(A) Actinides (B) Borides (C) Carbides (D) Hydrides

**Ans. :** a

(a) Actinides are homologous of Lanthanides.

124. Chloride of an element $A$ gives neutral solution in water. In the periodic table, the element $A$ belongs to

(A) First group (B) Third group

(C) Fifth group (D) First transition series

**Ans. :** a

$(a)$ First group e.g. $NaCl + H_2O \rightleftharpoons NaOH + HCl$

125. Elements after atomic number $103$ have been discovered till now. If an element with atomic number $106$ were ever discovered which of the following electronic configuration will it possess

(A) $[Rn]\,5f^{14}\,6d^4\,7s^2$ (B) $[Rn]\,5f^{14}\,6d^5 7s^1$

(C) $[Rn]\,5f^{14}\,6d^6\,7s^0$ (D) $[Rn]\,5f^{14}\,6d^1\,7s^2\,7p^3$

**Ans. :** b

$Z = 106 \rightarrow [R_n]\,5f^{14}6d^5 7s^1$

$[R_n]\ Z = 26$

$7s^2 \rightarrow d^4 + 1 = d^5$

126. Thalium shows different oxidation states because

(A) It is a transition element

(B) Of inert pair effect

(C) Of its amphoteric character

(D) Of its higher reactivity

**Ans. :** b

Thallium is a $p$ block element belonging to group $13$ and period $6$.

Electronic configuration of Thallium is $[Xe]\,4f^{14}\,5d^{10}\,6s^2\,6p^1$.

$d$ and $f$ electrons of inner shells provide poor shielding, thus the attraction of the nucleus on the $s$ electrons of the outermost shell increases. This is called the inert pair effect.

Whereas, $s$ electrons provide strong shielding to $p$ electrons, thus making it easy for the $p$ electrons to be released.

Thus, although Thallium shows $+3$ and $+1$ oxidation states, $+1$ is more common.

127. Which of the following presents the correct order of second ionization enthalpies of $C, N, O$ and $F$ ?

(A) $F > O > N > C$ (B) $O > N > F > C$ (C) $C > N > O > F$ (D) $O > F > N > C$

**Ans. :** d

In a period the value of ionisation potential increases from left to right with breaks where the atoms have some what stable configuration. After removing an $e^-$ oxygen will acquire stable configuration. Hence $O^+$ has highest second ionisation enthalpy than $F^+$ and $N^+$.

$\therefore$ correct order is $O > F > N > C$

128. Which among the following elements has the highest first ionization enthalpy?

(A) Nitrogen (B) Boron (C) Carbon (D) Oxygen

**Ans. :** a

Due to stable $2s^2\,2p^3$ configuration. (half filled $p-$ orbital) Nitrogen atom has highest energy.

129. The increasing order of the ionic radii of the given isoelectronic species is :

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

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

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

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

**Ans. :** c

For isoelectronic species, $r_n \propto \frac{1}{Z}$

Zere, $Z$ is atomic number

| Species | $Z$ | Electrons |
|---|---|---|
| $C^-$ | 17 | 18 |
| $Ca^{2+}$ | 20 | 18 |
| $K^+$ | 19 | 18 |
| $S^{2-}$ | 16 | 18 |

Thus, ionic size is in order $Ca^{2+} < K^+ < C^- < S^2$

130. Which one of the following orders presents the correct sequence of the increasing basic nature of the given oxides ?

(A) $Al_2O_3 < MgO < Na_2O < K_2O$ (B) $MgO < K_2O < Al_2O_3 < Na_2O$

(C) $Na_2O < K_2O < MgO < Al_2O_3$ (D) $K_2O < Na_2O < Al_2O_3 < MgO$

**Ans. :** a

$\overset{+5}{V}O_2^{\oplus}, \overset{+6}{Cr}_2O_7^{2-}, \overset{+7}{Mn}O_4^{\ominus}$

131. The correct sequence which shows decreasing order of the ionic radii of the elements is

(A) $Al^{3+} > Mg^{2+} > Na^+ > F^- > O^{2-}$

(B) $Na^+ > Mg^{2+} > Al^{3+} > O^{2-} > F^-$

(C) $Na^+ > F^- > Mg^{2+} > O^{2-} > Al^{3+}$

(D) $O^{2-} > F^- > Na^+ > Mg^{2+} > Al^{3+}$

**Ans. :** d

you can see all of them are isoelectronic and for isoelectric elements which ion has more positive charge will have lesser size. And Twhich ion has more negative charge that ion's size will be more.

So, the correct order is $O^2 > F^- > Na^+ > mg^{2+} > A^{3+}$

132. Following statements regarding the periodic trends of chemical reactivity of the alkali metals and the halogens are given. Which of these statements gives the correct picture?

(A) Chemical reactivity increases with increase in atomic number down the group in both the alkali metals and halogens

(B) In alkali metals the reactivity increases but in the halogens it decreases with increase in atomic number down the group

(C) The reactivity decreases in the alkali metals but increases in the halogens with increase in atomic number down the group

(D) In both the alkali metals and the halogens the chemical reactivity decreases with increase in atomic number down the group

**Ans. :** a

(1) In a period, from left to right the acidic strength increases that mean basic nature decreases.

(2) In a group, from top to bottom the basic nature increases that means acidic nature decreases.

$Na, Mg$ and $Al$ are present in same period so the order of basic nature among and $Al$ is $Na > Mg > Al$.

And $\mathrm{Na}$ and $\mathrm{K}$ are from same group so basic nature of $\mathrm{K} > \mathrm{Na}$.

So the correct order of oxides

$\mathrm{Al_2O_3} < \mathrm{MgO} < \mathrm{Na_2O} < \mathrm{K_2O}$

133. Among $Al_2O_3, SiO_2, P_2O_3$ and $SO_2$ the correct order of acid strength is

(A) $Al_2O_3 < SiO_2 < SO_2 < P_2O_3$

(B) $SiO_2 < SO_2 < Al_2O_3 < P_2O_3$

(C) $SO_2 < P_2O_3 < SiO_2 < Al_2O_3$

(D) $Al_2O_3 < SiO_2 < P_2O_3 < SO_2$

**Ans. :** d

(d) With decrease in size from $Al$ to $S$ the basic nature of oxide decrease and acidic nature increases.

$Al_2O_3 < SiO_2 < P_2O_3 < SO_2$

$Al_2O_3$ is amphoteric, $SiO_2$ is slightly acidic whereas $P_2O_3$ and $SO_2$ are the anhydrides of acids $H_3PO_3$ and $H_2SO_3$.

134. Select the amphoteric substance in the following

(A) $SO_3$ (B) $NaOH$ (C) $CO_2$ (D) $Al(OH)_3$

**Ans. :** b

$Al \rightarrow \quad 933\,K$
$Ga \rightarrow \quad 303\,K$
$In \rightarrow \quad 430\,K$
$Se \rightarrow \quad 490\,K$

135. Which of the following order is correct for the property mentioned in brackets ?

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

(B) $C < N < F < O$ ($2^{nd}$ Ionisation energy)

(C) $B > Al > Ga > In > Tl$ (Electronegativity)

(D) $Na^+ > Li^+ > Mg^{2+} > Be^{2+} > Al^{3+}$ (Ionic radius)

**Ans. :** b

$(b)$ $(a)$ Correct order $\rightarrow Ca^{2+} > K^+ > Cl^- > S^{2-}$ (Ionisation energy)

For isoeleetronic species $(I.E. \propto Z_{eff})$

$(b)$ Correct order $\rightarrow C < N < F < O$ $(2^{nd}\, I.E.)$

Second electron removal from oxygen requires more energy as it acquires table $2s^2\ 2p^3$
configuration after removal of one electron.

$(c)$ Correct order $\rightarrow B > Tl > In > Ga > Al$ (Electronegativity)

In general $EN$ increases in boron family from top to bottom due to increase in $Z_{eff}$ on
valence shell while boron has highest $E.N.$ due to its vary small size.

$(d)$ Correct order $\rightarrow Na^+ > Li^+ > Mg^{2+} > Al^{3+} > Be^{2+}$ (Ionic radius)

Ionic radius depends on $Z_{eff}$ and number of shells.

136. Aqueous solutions of two compounds $M_1 - O - H$ and $M_2 - O - H$ are prepared in two different beakers. If, the electronegativity of $M_1 = 3.4, M_2 = 1.2, O = 3.5$ and $H = 2.1$, then the nature of two solutions will be respectively

(A) acidic, basic (B) acidic, acidic (C) basic, acidic (D) basic, basic

**Ans. :** a

$(a)$ The electronegativity difference between $M_1$ and $O$ is $0.1$, which indicates $M_1 - O$ bond will be covalent, since $O - H$ bond having more ionic character thus bond will break and $H^+$ ions will release and acidic solution is formed. Whereas difference between electronegativity of $M_2 - O$ bond is $2.3$, thus, $M_2 - OH$ bond will break. Hence, solution will be basic in nature.

137. Correct expression of "Allred and Rochow's" scale is

(A) Electronegativity $= 0.744\ \frac{Z_{eff.}}{r^2} + 0.359$

(B) Electronegativity $= 0.359\ \frac{r^2}{Z_{eff.}} + 0.744$

(C) Electronegativity $= 0.359\ \frac{Z_{eff.}}{r} + 0.744$

(D) Electronegativity $= 0.359\ \frac{Z_{eff.}}{r^2} + 0.744$

**Ans. :** d

$(d)$ According to Allred and Rochow scale

$(c)\ EN_{AR} = 0.359 \frac{Z_{eff.}}{r} + 0.744$ ($r$ : radius in $\overset{o}{A}$)

138. Match the column?

| Column $-I$ | Column $-II$ |
|---|---|
| $(A)$ Ionisation potential | $(P)\ O < F < N$ |
| $(B)$ Electronegativity | $(Q)\ N < O < F$ |
| $(C)\ Z_{eff}$ | $(R)\ O < N < F$ |
| $(D)$ Electron affinity | $(S)\ N < C < O$ |

(A) $A - P,\ B - Q,\ C - S,\ D - R$

(B) $A - R,\ B - Q,\ C - Q,\ D - Q, S$

(C) $A-P,\ B-Q,\ C-Q,\ D-R$

(D) $A-R,\ B-Q,R,\ C-P,\ D-S$

**Ans. :** b

$I.E. \rightarrow\ O<N<F$

$E.N. \rightarrow\ N<O<F$

$Z_{eff} \rightarrow\ N<O<F$

$EA \rightarrow\ N<C<O$

139. The formation of the oxide ion $O^{2-}(g)$ requires first an exothermic and then an endothermic step as shown below

$O(g)+e^- \rightarrow O^-(g); \Delta H=-142\,kJ\,mol^{-1}$

$O^-(g)+e \rightarrow O^{2-}(g); \Delta H=844\,kJ\,mol^{-1}$

This is because

(A) $O^-$ ion has comparatively larger size than oxygen atom

(B) Oxygen has high electron affinity

(C) $O^-$ ion will tend to resist the addition of another electron

(D) Oxygen is more electronegative

**Ans. :** c

The formation of the oxide ion $O^{2-}(g)$ requires first an exothermic and then an endothermic step

$O_{(g)}\,e \rightarrow O^-_{(g)}; \Delta H=-142\,kJ/mol$

$O^-_{(g)}\,e \rightarrow O^{2-}_{(g)}; \Delta H=844\,kJ/mol$

This is because when an electron is added to negatively charged ion, it experiences more repulsion rather than attraction.

Hence the addition of the second electron usually requires energy. As a result, second electron affinity values are positive i.e. endothermic.

140. Consider the following changes

$M(s) \rightarrow M(g) \quad .....(1)$

$M(s) \rightarrow M^{2+}(g)+2e^- \quad .....(2)$

$M(g) \rightarrow M^+(g)+e^- \quad .....(3)$

$M^+(g) \rightarrow M^{2+}(g)+e^- \quad .....(4)$

$M(g) \rightarrow M^{2+}(g)+2e^- \quad .....(5)$

The second ionization energy of $M$ could be calculated from the energy values assoclated with

(A) $1+3+4$ (B) $2-1+3$ (C) $1+5$ (D) $5-3$

**Ans. :** d

$(d)$ Second ionization energy is amount of energy required to take out an electron from the monopositive cation.

Hence, $M(g) \rightarrow M^{2+} + 2e^-$ .....(5)

$M(g) \rightarrow M^+ + e^-$ .....(3)

141. $X_g \rightarrow X^+_{(g)} + e^-, \quad \Delta H = +720\, kJ\, mol^{-1}$

Calculate the amount of energy required to convert $110\, mg$ of $'X'$ atom in gaseous state into $X^+$ ion ..... kJ (Atomic wt. for $X = 7\, g/mol$)

(A) $10.4$ (B) $12.3$ (C) $11.3$ (D) $14.5$

**Ans. :** c

For one mole of $X (7\, gm$ of $X)$, required energy is $720\, kJ/mol$.

So, energy required for $110\, mg$ of $X = (720/7) \times 0.110 = 11.3\, kJ$ .

142. Second ionization potential of $Li, Be$ and $B$ is in the order

(A) $Li > Be > B$ (B) $Li > B > Be$ (C) $Be > Li > B$ (D) $B > Be > Li$

**Ans. :** b

Second ionization potential depends on the electron ejection from $Li^+, Be^+$ and $B^+$

Electronic configuration for these ions is:

$Li^+ : 1s^2$

$Be^+ : 1s^2\, 2s^1$

$B^+ : 1s^2\, 2s^2$

For, lithium and boron, electron is to be ejected from fully filled stable shells.

Further, it is difficult to remove electron from is shell of $Li$ because it is closer to the nucleus as compared to $2s$ shell of $B$. It is much easier to remove electron from $Be$ because it will attain stable electronic configuration after losing this electron.

Thus, order is $Li > B > Be$

143. $X$ , $Y$ & $Z$ are elements of same period & also belongs to $p-$ block elements. $Y$ has positive value of $\Delta\, Heg$ & $'Z'$ has highest value of $2^{nd} I.E$ among them. Then correct order of their atomic number is

$(a)\ X < Y < Z \quad (b) X < Z < Y$

$(c) Y < Z < X \quad (d) Z < Y < X$

(A) only $a$ (B) $a$ & $c$ (C) $b$ , $c$ & $d$ (D) all are correct

**Ans. :** (B) $a$ & $c$

144. The set representing the correct order of ionic radius is

(A) $Na^+ > Mg^{2+} > Al^{3+} > Li^+ > Be^{2+}$

(B) $Na^+ > Li^+ > Mg^{2+} > Al^{3+} > Be^{2+}$

(C) $Na^+ > Mg^{2+} > Li^+ > Al^{3+} > Be^{2+}$

(D) $Na^+ > Mg^{2+} > Li^+ > Be^{2+}$

**Ans. :** b

The set representing the correct order of ionic radius is

$Na^+ > Li^+ > Mg^{2+} > Al^{3+} > Be^{2+}$ .

In a period, on moving from left to right, the ionic radius decreases. Hence, $Na^+ > Mg^{2+} > Al^{3+}$ and $Li^+ > Be^{2+}$

In a group, on moving down from top to bottom, the ionic radius increases. Hence, $Na^+ > Li^+$ and $Mg^{2+} > Be^{2+}$

145. Incorrect order of radius is

(A) $Sr^{2+} < Rb^+ < Br^- < Se^{2-}$

(B) $Nb^{5+} < Zr^{4+} < Y^{3+}$

(C) $Co > Co^{2+} > Co^{3+} > Co^{4+}$

(D) $Ba^{2+} < Cs^+ < Se^{2-} < As^{3-}$

**Ans. :** d

$(d)$ In $(a)$ and $(b)$ use $(z/e)$ concept for isoelectronic specie.

In $(c)$ size of neutral atom is greater than its cation.

In $(d)$ $Se^{2-}$ and $As^{3-}$ related with $4^{th}$ period, while $Ba^{2+}$ and $Cs^+$ related with $6^{th}$ period. (These are not isoelectronic species.)

146. Incorrect order of ionic size is

(A) $La^{3+} > Gd^{3+} > Eu^{3+} > Lu^{3+}$

(B) $V^{2+} > V^{3+} > V^{4+} > V^{5+}$

(C) $Tl^+ > In^+ > Sn^{2+} > Sb^{3+}$

(D) $K^+ > Sc^{3+} > V^{5+} > Mn^{7+}$

**Ans. :** a

$(a)$ Correct order : $La^{3+} > Gd^{3+} > Eu^{3+} > Lu^{3+}$

147. $Na^+$, $Mg^{2+}$, $Al^{3+}$, $Si^{4+}$ are isoelectronics. Their ionic size follows the order

(A) $Na^+ < Mg^{2+} < Al^{3+} < Si^{4+}$

(B) $Na^+ > Mg^{2+} > Al^{3+} > Si^{4+}$

(C) $Na^+ < Mg^{2+} > Al^{3+} > Si^{4+}$

(D) $Na^+ > Mg^{2+} < Al^{3+} > Si^{4+}$

**Ans. :** (C) $Na^+ < Mg^{2+} > Al^{3+} > Si^{4+}$

148. The ground state electronic configurations of the elements, $U, V, W, X,$ and $Y$ (these symbols do not have any chemical significance) are as follows

$U$ $1s^2\ 2s^2\ 2p^3$

$V$ $1s^2\ 2s^2\ 2p^6\ 3s^1$

$W$ $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^2$

$X$ $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^5\ 4s^2$

$Y$ $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^6$

Determine which sequence of elements satisfy the following statements :

$(i)$ Element forms a carbonate which is not decomposed by heating

$(ii)$ Element is most likely to form coloured ionic compounds

$(iii)$ Element has largest atomic radius

$(iv)$ Element forms only acidic oxide

(A) $V W Y U$ (B) $V X Y W$ (C) $V W Y X$ (D) $V X W U$

**Ans. :** b

$(b)$ $(i)$ Alkali metal carbonates do not decompose even at red hot $\rightarrow V$

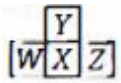
$(ii)$ Transition metal ions having unpaired $d-$ electrons are coloured in aq. sol./compounds $\rightarrow X$

$(iii)$ In case of $Kr$ van der Waals' radius is considered, which is largest atomic radius $\rightarrow Y$

$(iv)$ $Si$ atom has only acid $SiO_2 \rightarrow W$

149. Consider the following four elements, which are represented according to long form of periodic table.

Here $W, Y$ and $Z$ are left, up and right elements with respect to the element $'X'$ and $'X'$ belongs to $16^{th}$ group and $3^{rd}$ period. Then according to given information the incorrect statement regarding given elements is



(A) Maximum electronegativity : $Y$

(B) Maximum catenation property : $X$

(C) Maximum electron affinity : $Z$

(D) $Y$ exhibits variable covalency

**Ans. :** d

$(d)$ $W$ : Phosphorus $Y$ : Oxygen $X$ : Sulphur $Z$ : Chlorine

Electronegativity : $O > Cl > S > P$ Catenation: $S > P > O > Cl$

Electron Affinity : $Cl > O > S > P$ Oxygen exhibits covalency of two only

150. If $IUPAC$ name of an element is "$ununium$" then correct statement regarding element is

(A) It is a inner transition element

(B) It belongs to $8^{th}$ period in periodic table

(C) It is transition element

(D) It is a non-transition element

**Ans. :** c

$(c)$ "$Ununium$" : At number $= 111$

It is a transition element. Period number $= 7^{th}$; Group number $= 11$

----- घायल तो यहां हर परिंदा है। मगर जो फिर से उड़ सका वहीं जिंदा है.. -----