

SRIGAYATRI EDUCATIONAL INSTITUTIONS

SR MPC

INDIA

Classification of elements

- Which of the following is Dobereiner triad
 - 1) Ru, Rh, Pd
 - 2) Os, Ir, Pt
 - 3) Fe, Co, Ni
 - 4) Li, Na, K
- Eka silicon is now known as
 - 1) Ga
 - 2) B
 - 3) Sc
 - 4) Ge
- In Lothar Mayer graph, the elements which occupy bottom position of the curves will have
 - 1) Maximum atomic radius
 - 2) High atomic mass
 - 3) High density
 - 4) Least density
- Incorrect statement regarding Mendeleev's periodic table is
 - 1) no different position for isotopes
 - 2) three elements (Fe, Co, Ni) kept together in same group
 - 3) able to predict properties of unknown elements also
 - 4) There are 18 groups and 7 periods
- In the long form of periodic table, the number of period indicates the value of
 - 1) atomic number
 - 2) atomic mass
 - 3) principal quantum no.
 - 4) Azimuthal quantum no.
- Element with atomic number 38, belongs to
 - 1) II A group and 5th period
 - 2) II A group and 2nd period
 - 3) V A group and 2nd period
 - 4) III A group and 5th period
- Among s-block metals and transition metals which are more metallic?
 - 1) s-block elements
 - 2) Transition metals
 - 3) both are equally metallic
 - 4) Cannot be predicted
- What is the atomic number of last member of the 7th period of the extended form of periodic table?
 - 1) 116
 - 2) 118
 - 3) 120
 - 4) 122
- The starting element and last element in the largest period in modern periodic table are
 - 1) Rb and Xe
 - 2) Cs and I
 - 3) Cs and Rn
 - 4) Fr and Kr
- The elements with atomic number 10, 18, 36, 54 and 86 are will
 - 1) Light metals
 - 2) Inert gases
 - 3) Halogens
 - 4) Rare earths
- Element with electronic arrangement $[Ar]3d^24s^2$ belongs to

- 1) s-block 2) p-block 3) d-block 4) f-block
12. Effective nuclear charge of 4s-electron in Zn-atom is
- 1) 30 2) 4.35 3) 25.65 4) 8.85
13. In which of the following sets, elements have nearly same atomic radii?
- 1) Li, Be, B 2) Mg, Ca, Sr 3) Fe, Co, Ni 4) O, S, Se
14. Ionic radius is highest for
- 1) H^- 2) F^- 3) Cl^- 4) Br^-
15. Correct order of sizes is
- 1) $I^- > I > I^+$ 2) $I > I^- > I^+$ 3) $I^+ > I^- > I$ 4) $I > I^+ > I^-$
16. Ionisation potential values of Li, Be and B are respectively in $KJmol^{-1}$
- 1) 801, 899, 520 2) 520, 801, 899 3) 899, 801, 520 4) 520, 899, 801
17. Incorrect match among the following is
- 1) $I.E_1$ for $P > S$ 2) $I.E_1$ for $In > Tl$ 3) $I.E_2$ for $Cr > Mn$ 4) $I.E_1$ for $Zn > Cu$
18. Which of the following is the correct order of electron affinity?
- 1) $I > Br > F > Cl$ 2) $F < Cl < Br < I$ 3) $F > Cl > Br > I$ 4) $I < Br < F < Cl$
19. The electronegativity of the following elements increase in the order.
- 1) C, N, Si, P 2) N, Si, C, P 3) Si, P, C, N 4) P, Si, N, C
20. The more basic oxide is
- 1) CaO 2) MgO 3) K_2O 4) Na_2O
21. Highest oxidation state exhibited by
- 1) $[He]2s^2 2p^2$ 2) $[Ne]3s^2 3p^3$ 3) $[Ar]3d^5 4s^2$ 4) $[Ar]3d^{10} 4s^1$
22. The diagonal relationship phenomenon is not observed after
- 1) I A Group 2) II A Group 3) III A Group 4) IV A Group
23. The correct order regarding E.N of hybrid orbitals of carbon is
- 1) $sp < sp^2 < sp^3$ 2) $sp < sp^2 > sp^3$ 3) $sp > sp^2 < sp^3$ 4) $sp > sp^2 > sp^3$
24. The lanthanide contraction is responsible for the fact that
- 1) Zr and Y have about the same radius 2) Zr and Nb have similar oxidation state
- 3) Zr and Hf have about the same radius 4) Zr and Zn have the same oxidation state
25. The stable oxidation state of Thallium, a III A group element is

- 1) +1 2) +3 3) -3 4) +5
26. Basic nature of the oxides of a period from left or right
- 1) increases 2) decreases
3) remain constant 4) first increases and then decrease
27. Which of the following oxide is amphoteric?
- 1) CrO 2) Cr_2O_3 3) CrO_3 4) CrO_5
28. The diamagnetic species among the following is
 $Cu^{2+}, Cr^{3+}, Co^{3+}, Cd^{2+}$
- 1) Cu^{2+} 2) Cd^{2+} 3) Cr^{3+} 4) Co^{3+}
29. Electronic Configurations of four elements A, B, C and D are given below
- 1) $1S^2 2S^2 2P^6$ 2) $1S^2 2S^2 2P^4$ 3) $1S^2 2S^2 2P^6 3S^1$ 4) $1S^2 2S^2 2P^5$
- Which of the following is the correct order of increasing tendency to gain electrons?
- 1) $I < II < III < IV$ 2) $IV < II < III < I$ 3) $I < III < II < IV$ 4) $IV < I < II < III$
30. Which of the following elements Can show covalency greater than 4 ?
- 1) Be 2) P 3) Li 4) B
31. Which of the following contain only isoelectronic ions ?
- 1) $Zn^{2+}, Ca^{2+}, Ca^{3+}, Al^{3+}$ 2) $K^+, Ca^{2+}, Sc^{3+}, Cl^-$
3) $P^{3-}, S^{2-}, Cl^-, K^-$ 4) $Ti^{4+}, Ar, Cr^{3+}, V^{5+}$
32. Which of the following have no units ?
- 1) Electronegativity 2) Election gain Enthalpy
3) Ionisation enthalpy 4) Metallic character
33. The electronic configuration gadolinium [Atomic number 64] is
- 1) $[Xe]4f^3 5d^5 6s^2$ 2) $[Xe]4f^7 5d^2 6s^1$
3) $[Xe]4f^7 5d^1 6s^2$ 4) $[Xe]4f^7 5d^6 6s^2$
34. [A] : Electrons gain enthalpy generally becomes less negative as we go down a group
[R] : Size of the atom increases on going down the group and the added electron would be farther from the nucleus
- 1) Both (A) and (R) are true and (R) is the correct explanation of (A)
2) Both (A) and (R) are true and (R) is not the correct explanation of (A)

- 3) (A) is wrong (R) is correct
- 4) Both (A) and (R) are false
35. [A] : The first ionisation energy of Be is greater than that of B.
[R] : 2p-orbital is lower in energy than 2s-orbital
- 1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- 2) Both (A) and (R) are true and (R) is not the correct explanation of (A)
- 3) Both (A) and (R) are true
- 4) Both (A) and (R) are false
36. [A] : The ionic size of Mg^{2+} is larger than Al^{3+}
[R] In isoelectronic species, greater the nuclear charge less is the size
- 1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- 2) Both (A) and (R) are true and (R) is not the correct explanation of (A)
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- 3) Both (A) and (R) are true
- 4) Both (A) and (R) are false

INTEGER TYPE QUESTIONS

38. Select the number of elements which are added transition metals B, Sc, Al, Pd, Os, Zr, Rb, Ba, Fr.
39. The Element with the lowest atomic number that has a ground state electronic Configuration of $(n-1)d^5ns^2$ is located in _____ period
40. Find the total number of species having two unpaired electrons from the following species
 $Fe^{2+}, Cr, Cr^{3+}, Ti^{2+}, Mn^{3+}, Mo^{2+}, V^{3+}$
41. Among the following, the number of elements showing Only one non – zero oxidation State is
O, Cl, F, N, P, Sn, Tl, Na, Ti
42. In a period, the element with largest atomic volume belongs to which of the group?

KEY SHEET

CHEMISTRY

1) 4	2) 4	3) 4	4) 4	5) 3	6) 1	7) 1	8) 2	9) 3	10) 2
11) 3	12) 2	13) 3	14) 1	15) 1	16) 4	17) 2	18) 4	19) 3	20) 3
21) 3	22) 4	23) 4	24) 3	25) 1	26) 2	27) 2	28) 2	29) 2	30) 2
31) 2	32) 1,4	33) 3	34) 3	35) 1	36) 1	37) 1	38) 4	39) 4	40)
41) 2	42) 1								

SOLUTIONS

5. The Serial number of the period indicates the principal quantum number (n) which is the value of the valence shell of the atoms of the elements present in the period
8. The last member of the sixth period is radon, its atomic number is 86. In the 7th period energy shells 7s, 5f, 6d and 7p are completed.
i.e. $2 + 14 + 10 + 6 = 32$ electrons are to be accommodated. Thus, in the 7th period, 32 elements will be present. So the atomic number of the last member will be $86 + 32 = 118$
11. Outer electronic configuration is $3d^2 4s^2$. Outer electrons are entered into d – shell
12. For 4s electron
$$\sigma = (0.35 \times 1) + (0.85 \times 18) + (1 \times 10) = 25.65$$

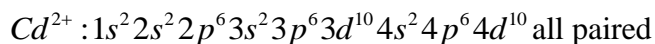
Effective nuclear charge $Z^* = Z - \sigma$
$$= 30 - 25.65 = 4.35$$
14. H^- contains 2 electrons.
 F^- , Cl^- and Br^- ions get eight electrons in their outermost orbitals. So ionic radius will be decreased
15. Anions are larger than neutral atoms and positive ions, I^- larger than I and I^+ ion
17. 1st Ionisation energy of “In” is greater than “Tl”
18. Electron affinity decreases from top to bottom in group
But electron affinity of fluorine is less than chlorine.
21. $[Ar]3d^5 4s^2$ Contains more unpaired e^- in d – orbital. So it exhibits more Oxidation states
23. Electron negativity increases as s – character in hybrid orbital increases

24. The elements of Second and third transition Series resemble each other more closely than the elements of first and 2nd Series on account of lanthanide Contraction.

The pair of elements such as Zr – Hf, Mo – W, Nb – Ta etc possess almost the same properties

25. Due to inert pair Effect Thallium Exhibits “ + 1 “ Oxidation State.

28. Diamagnetic species have all paired electrons.



30. Phosphorous shows maximum covalency is “6”

31. $K^+ = 18e^-$, $Ca^{+2} = 18e^-$, $Sc^{3+} = 18e^-$, $Cl = 18e^-$

All shows equal number of electrons.

32. E.N and metallic characters have no units while electron gain enthalpy and ionisation enthalpy have units of kJ mol^{-1})

33. The electronic configuration of La (Z=57) is $[Xe]5d^1 6s^2$ therefore, further addition of electrons occurs in a lower energy 4f – orbitals till it is exactly half filled at Eu (Z=63). Thus the electronic configuration of Eu is $[Xe] 4f^7 6s^2$. Therefore, addition of next electron doesnot occur in a more stable exactly half filled 4f⁷ shell but occur in a little higher energy of 5d orbital. Thus the electronic configuration of Gd (Z=64) is $[Xe] 4f^7 5d^1 6s^2$.

38. [Sc, Pd, Os, Zr]

41. Na exhibits +1 and F exhibits -1 oxidation states.

42. In a period, alkali metal which belongs to group I shows largest atomic volume.