

Worksheet(2)**Configurations of ions**

[1] Electronic configuration of Ni^{4+} ion is

- a) $[\text{Ar}]4\text{S}^2,3\text{d}^8$
- b) $[\text{Ar}]4\text{S}^2,3\text{d}^6$
- c) $[\text{Ar}]4\text{S}^1,3\text{d}^7$
- d) $[\text{Ar}]4\text{S}^0,3\text{d}^6$

[2] Electronic configuration of ion of a transition element is.....

- a) $[\text{Ar}]4\text{S}^1,3\text{d}^5$
- b) $[\text{Ar}]4\text{S}^2,3\text{d}^0$
- c) $[\text{Ar}]4\text{S}^0,3\text{d}^2$
- d) no correct answer

[3] The number of unpaired electrons in d-sublevel in manganese in MnCl_2 is.....

- a) 1
- b) 2
- c) 3
- d) 4

[4] In which of the following compounds its electronic configuration of the transition metal ion $[\text{Ar}]3\text{d}^4$?

- a) $\text{K}_2\text{Cr}_2\text{O}_3$
- b) CrO_2
- c) CrCl_3
- d) CrF_2

[5] Transition element (X) from the fourth period and the 6th column in periodic table so that the electronic distribution, of the triple ion ends with

- a) 3d^6
- b) 3d^5
- c) 3d^4
- d) 3d^3

[6] Element (X) from second transition series its configuration in atomic state ended by d^6 so the configuration of the element below it in the same column in oxidation state 3+:

- a) 5d^4
- b) 5d^4
- c) 5d^5
- d) 3d^6

[7] Ion X^{3+} of transition element its electronic configuration $[\text{Ar}] 3\text{d}^5$ the atomic number is.....

- a) 24
- b) 25
- c) 26
- d) 27

[8] What is the element which its electronic configuration ends with $5d^8$ in the case of $3+$ oxidation state

- a) Fourth period and group IB
- b) Sixth period and group IB
- c) Sixth period and group IIB
- d) Fifth period and group IB

[9] X^{3+} is a transition element's ion its electronic configuration is $4s^0 3d^2$, so maximum oxidation state of this element is.....

- a) $3+$
- b) $6+$
- c) $5+$
- d) $4+$

[10] In both the copper ion (Cu^{2+}) and the cobalt atom (Co), electrons are

- a) Equal in number and similar in electronic configuration
- b) Equal in number and different in electronic configuration
- c) different in number and electronic configuration
- d) There is no correct answer

[11] The following table represents the values of ionization potentials from the first to the seventh for an element (X) from the first transition series:

Ionization	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th
Values(K.J/mol)	633	1235	2389	7091	9581	14679	15310

From this table answer A, B & C:

A- this element configuration in atomic state

- a) $[_{18}Ar]4s^1,3d^5$
- b) $[_{18}Ar]4s^2,3d^3$
- c) $[_{18}Ar]4s^2,3d^1$
- d) $[_{18}Ar]4s^2,3d^2$

B- this element located in group no.in long periodic table

- (a) 1B
- (b) III B
- (c) VI B
- (d) IV B

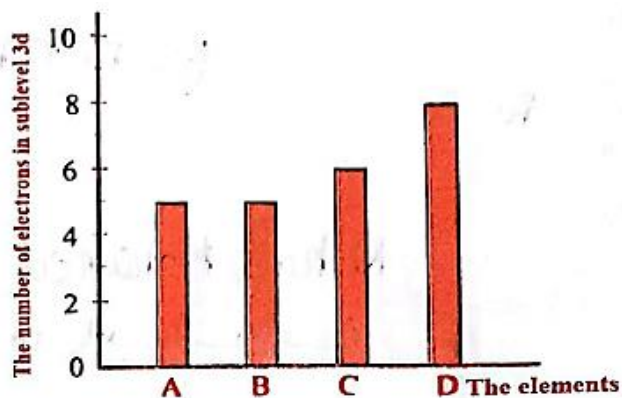
C- What is the chemical formula of that element oxide

- (a) XO
- (b) X_2O_3
- (c) X_2O_5
- (d) XO_2

[12] The electronic configuration of X^{3+} ion for an element exists in second transition Series

- a) $[_{18}\text{Ar}], 3d^1$
- b) $[_{36}\text{Kr}], 4d^9$
- c) $[_{18}\text{Ar}], 3d^9$
- d) $[_{36}\text{Kr}], 4d^1$

[13] The figure shows the number of electrons in sublevel (3d) of elements (A, B, C, D), knowing that the atomic number of element B is larger than the element A. Study this figure then answer the following questions:



A. The element which contains 6 unpaired electrons is

- (a) A
- (b) B
- (c) C
- (d) D

B. The element that has $3+$ ion which contains four unpaired electrons is

- (a) A
- (b) B
- (c) C
- (d) D

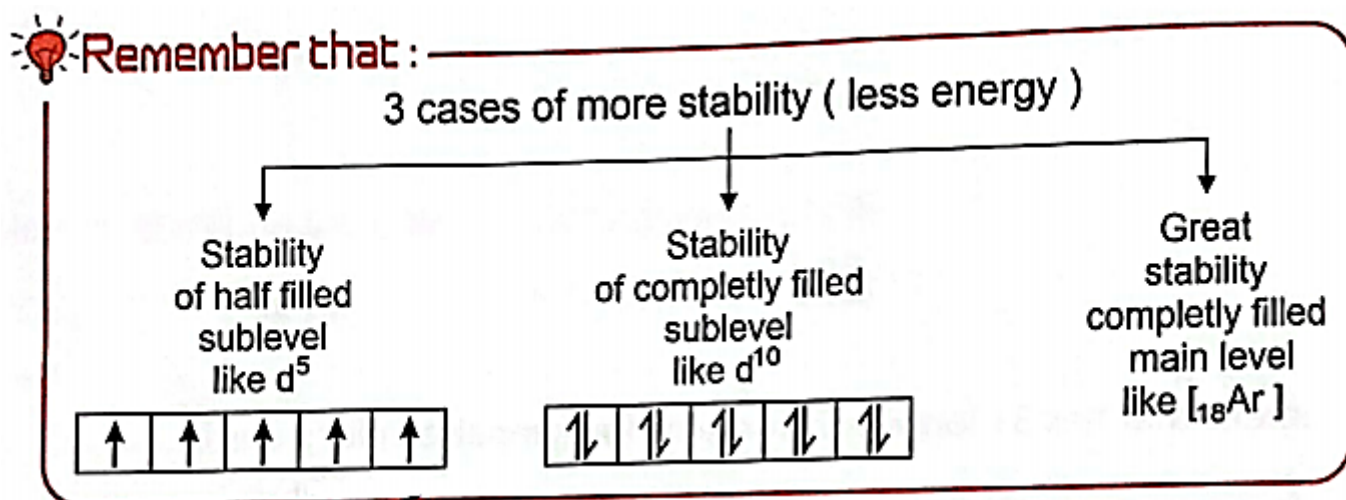
C. The element that has $3+$ ion which contains five unpaired electrons is

- (a) A
- (b) B
- (c) C
- (d) D

[14] The oxidation state to elements VB cause in break complete energy level of inert gas

- (a) $4+$
- (b) $5+$
- (c) $6+$
- (d) $7+$

Stability of configuration



[15] All of configurations d^5 , d^{10} & noble gas are described by.....

- more stable
- less energy
- a&b are correct
- a& b are incorrect

[16] one of the following is the most stable ion.....

- iron II ion.
- Titanium II ion.
- Iron III ion
- cobalt III ion.

[17] Which one of the following vanadium oxides is the most stable

- V_2O_5
- VO_2
- V_2O_3
- VO

[18] The correct order according to stability

- $\text{Fe}^{3+} > \text{Fe}^{2+} > \text{Ti}^{4+}$
- $\text{Fe}^{2+} > \text{Fe}^{3+} > \text{Ti}^{4+}$
- $\text{Fe}^{2+} > \text{Ti}^{4+} > \text{Fe}^{3+}$
- $\text{Ti}^{4+} > \text{Fe}^{3+} > \text{Fe}^{2+}$

[19] Which of the following elements prefer to form the most stable compound of formula (XCl_2)

- a) ${}_{22}Ti$
- b) ${}_{26}Fe$
- c) ${}_{25}Mn$
- d) ${}_{29}Cu$

[20] The element which forms with chlorine a very stable compound with formula MCl_4 is

- a) located in group IIIB
- b) located in group IVB
- c) located in group IIB
- d) located in group IB

[21] Which one of the following elements is expected to have the highest third ionization potential?

- a) Vanadium (23)
- b) Chromium (24)
- c) Manganese(25)
- d) Iron(26)

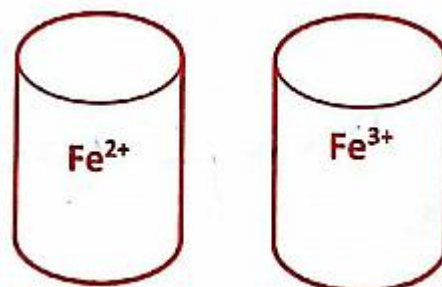
Easy or difficult oxidation or reduction

[22] For a transition element $2X$, process of oxidation from X^{3+} to X^{4+} .

- a) easy to occur .
- b) difficult to occur
- c) needs a very high energy
- d) b & c are correct

[23] Leaving the two solutions in air for a period of time, it was noticed that one of them changed and became the same color of the other which one is changed?

- a- Fe^{2+} changed into Fe^{3+}
- b- Fe^{3+} changed into Fe^{2+}
- c- a & b are correct
- d- a & b are incorrect



[24] What do you conclude from:

" iron II sulphate its color change if left in air for a long time" we can conclude that

- a) Iron II sulphate is a strong reducing agent
- b) Iron II ion is less stable than iron III
- c) Components of air are reducing agent
- d) a& b are correct

[25] Which of the following conversions occurred easily under normal conditions

- a) $\text{Mn}_2\text{O}_3 \rightarrow \text{MnO}$
- b) $\text{V}(\text{NO}_3)_5 \rightarrow \text{VCl}_2$
- c) $\text{TiO}_2 \rightarrow \text{Ti}_2\text{O}_3$
- d) $\text{ScCl}_3 \rightarrow \text{SC}$

Definition of transition element

[26] All the following compounds prove that copper is a transition element except

- a) CuO
- b) CuCl_3
- c) Cu_2O
- d) CuSO_4

[27] The number of elements in the 1st transition series =

- a) 8
- b) 9
- c) 10
- d) 14

[28] The number of transition elements in the 1st transition series =

- a) 8
- b) 9
- c) 10
- d) 14

[29] The modern periodic table containsmain transition elements.

- a) 40
- b) 36
- c) 20
- d) 18

[30] The two elements from 1st transition series, each one of them has only one oxidation state, are similar in

- a) Number of 3d electrons
- b) They are transition elements
- c) Same horizontal period
- d) Same vertical group

[31] The three transition elements that have completely filled d sublevel in their atomic states.

- a) $_{21}$ Scandium, $_{22}$ titanium & $_{23}$ Vandium
- b) $_{26}$ iron, $_{27}$ cobalt & $_{28}$ nickel
- c) $_{30}$ zinc, $_{48}$ cadmium & $_{80}$ mercury
- d) $_{29}$ Copper, $_{47}$ silver & $_{79}$ gold.

[32] Element (X) from group (IB) while element (Y) from group (IIB) SO

- a) configuration of X in $ns^2, (n-1)d^9$
- b) oxidation states are multiple for both (X) & (Y)
- c) both (X) & (Y) are transition elements
- d) all the previous are incorrect

[33] Locate a non - transition element from d- block in 3rd transition series:

- a) period 6 & group IB
- b) period 5 & group VIII
- c) period 6 & group IIB
- d) period 6 & group IVB

[34] 1st transition series consists of 10 elements, starts with $_{21}$ Sc, how many

Protons in the nucleus of the last transition element in this series :

- a) 30
- b) 22
- c) 29
- d) 40

[35] The element (X) ends in the electronic configuration ($4d^8$) and the element (Y) ends in the electronic configuration ($4d^6$) then the two element (X), (Y)?

- a) They are only in the same group
- b) They are only in the same period
- c) They are located in the same group and period
- d) They are non-transition elements

[36] There is no transition element, its 3d sublevel contains number of electrons isthe electrons of 4s sublevel

- a) Equal
- b) double
- c) triple
- d) five times
- c) (b) and (d) are correct

[37] The sublevel (4s) of the transition element that has the greatest atomic number in the 1st transition series contains electrons

- a) 1 b) 2 c) 3 d) 4

[38] A group of elements has general electronic configuration :ns², (n-1)d⁶⁻⁸

All the following sentences are represent it except

- a) Formed from 12 transition elements.
 b) Exists between group 7 and group 10
 c) Have the same chemical properties.
 d) Electronic configuration of its all elements is anomalous

[39] if the electronic configuration of an ion of an element X³⁺:₁₈Ar, so the element is

- a) Transition element because it has (3+) oxidation state
 b) Not transition element because the 3d sublevel is empty in its (3+) oxidation state
 c) Not transition element because the sublevel 4s is empty in its (3+) oxidation state
 d) Transition element because the 3d sublevel isn't filled with electrons in its atomic state

Atomic mass — atomic radius — density

[40] Atomic radii of d-block elements in a series

- a) Decrease with increases in atomic number
 b) Increase with increase in atomic number
 c) nearly remain constant
 d) None of the above

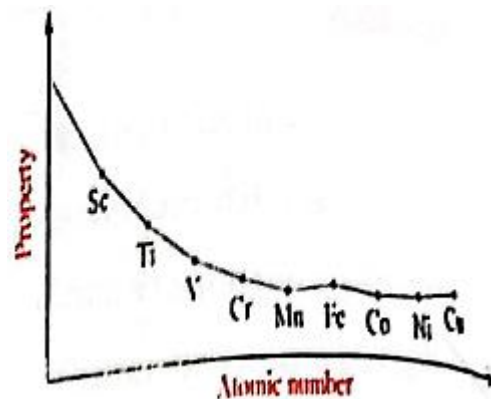
[41] Given that X, Y & Z are (3) successive elements from the 1st transition series their atomic radius are 1.17, 1.17 & 1.16 Å, you can explain these numbers by :

- a) increasing atomic masses by increasing atomic numbers.
 b) presence of isotopes for transition elements
 c) increase both attraction between nucleus & electrons and also increase repulsion among electrons.
 d) multiple oxidation states for transition elements

[42] In industry we can make Fe + Mn alloy , Fe + Cr alloy ... & many alloys from elements of 1st transition series , Which property allowing that?

- a) Because their atomic density increase gradually
- b) Because their atomic masses increase gradually
- c) Because their chemical activity decrease gradually
- d) Because they have nearly the same atomic radius

[43] In the opposite graphical figure which shows graduation in a certain property in the elements of the first transition series with increasing the atomic number. What is this property which is represented by the vertical axis?



- a) maximum oxidation states
- b) Atomic mass
- c) Density
- d) Atomic radius

[44] Drop in atomic mass of nickel relative to other elements because...

- a) nickel has high atomic number
- b) nickel has high mass number
- c) nickel found in 5 stable isotopes
- d) a& b are correct

[45] The atomic mass of the heaviest nickel isotope is.....58.7u

- a) more than
- b) less than
- c) equals
- d) slightly less than

[46] If you know the density of vanadium 6.07g/cm^3 , and density of cobalt = 8.7g/cm^3 so the density of manganese is.....

- a) 3.1
- b) 8.92
- c) 7.21
- d) 8.7

[47] Copper ($_{29}\text{Cu}$) has higher density than

- a) $_{22}\text{Ti}$
- b) $_{26}\text{Fe}$
- c) $_{25}\text{Mn}$
- d) All the previous

[48] Densities for the first four successive elements X, Y, Z & M in one of transition series are $7.2, 3.1, 4.4, 6 \text{ g/cm}^3$ (not respectively) from these givens :

- a) density of $Z=6\text{g/cm}^3$
- b) graduation of density for these 4 elements explained by increasing both atomic masses & atomic volume by increasing their atomic numbers
- c) Z & M are the best from them to be used in making aeroplane body
- d) element with density 7.2 g/cm^3 is the smallest atomic mass of them

[49] Element (M) from 1st transition series but its density lower than most of elements in this series. If this element can form with chlorine only these compounds not more MCl_2 , MCl_3 & MCl_4 so atomic number of M is :

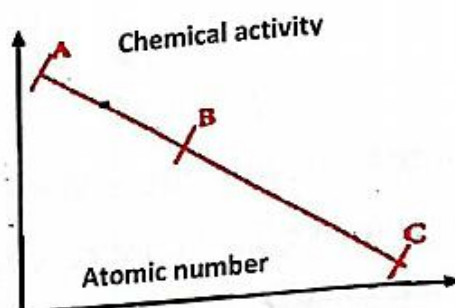
- a) 28
- b) 22
- c) 24
- d) 27

[50] Two samples of iron and titanium have the same mass, which has bigger Volume and what are the reason of that?

Chemical activity - metallic properties

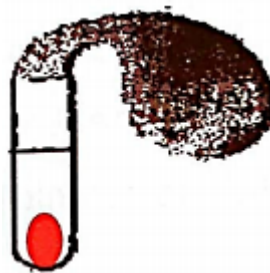
[51] The figure shows the most active and the less active 3d elements. Element B gets rusted in humid air. Which of the following shows chromium activity position compared to the three metals?

- a) $A < \text{Cr} < B < C$
- b) $A < C < B < \text{Cr}$
- c) $A > \text{Cr} > B > C$
- d) $B < \text{Cr} < A < C$



[52] Four identical test tubes, the same amount of pure water was placed in each of them, equal mass of different 3d metal elements were added. Which of the following will swell the balloon in the shortest time?

- a) Cu
- b) Zn
- c) Sc
- d) Fe



[53] Which electronic configuration of corresponds to the most reactive metal?

$_{27}X:_{18}Ar\ 4s^2,3d^7$, $_{28}Z:_{18}Ar\ 4s^2,3d^8$, $_{29}Y:_{18}Ar\ 4s^1,3d^{10}$, $_{21}W:_{18}Ar\ 4s^2,3d^1$

- a) Electronic of configuration X
- b) Electronic of configuration Z
- c) Electronic of configuration Y
- d) Electronic of configuration W

[54] $_{39}X$ is a main transition element , which choice is incorrect for it :

- a) from group IIIB
- b) has only one oxidation state 3+
- c) found in third transition series
- d) can replace hydrogen of water

[55] Transition element with moderate chemical activity

- a) $_{21}Sc$
- b) $_{26}Fe$
- c) $_{29}Cu$
- d) $_{30}Zn$

[56] A,B&C are three ordered elements from the same transition series but not successive elements, maximum oxidation states of Bis 7+ .so all the following are correct except ...

- a) atomic mass of C>B
- b) density of B>A
- c) chemical activity of C>B
- d) Maximum oxidation states for both A & C not exceed that of B

[57] Which of the following is not likely to be a transition metal?

- a) they are good conductors of heat.
- b) they are good conductors of electricity.
- c) they are usually hard.
- d) they have low densities.

[58] Main transition element (R) its configuration in atomic state ended by $5d^1$

so element (R) relative to the following elements.in the same series .all the following except:

- a) higher chemical activity
- b) does not have multiple oxidation state
- c) Smaller atomic volume
- d) smaller atomic mass

[59] Water loses its hydrogen as quickly as possible by the effect of metals on it,

- a) IIIB
- b) IVB
- c) VB
- d) VIIB

[60] From the following table which of the following is correct?

The atom or ion	Electronic configuration
A	$[\text{18Ar}]4\text{S}^23\text{d}^1$
B³⁺	$[\text{18Ar}]3\text{d}^5$
C³⁺	$[\text{18Ar}]3\text{d}^4$
D	$[\text{18Ar}]4\text{S}^23\text{d}^2$

- a) $A > B > C > D$ in density.
- b) $A < D < C < B$ in atomic weight.
- c) A is less active than the next element in the same period
- d) C conducts electric current more than the next element in the same period.

HomeWork(2)

[61] The ions which have the electronic configuration $[\text{Ar}]3d^4$ are:

- a) $\text{Mn}^{2+}/\text{CO}^{2+}$
- b) $\text{Fe}^{3+}/\text{Cr}^{3+}$
- c) $\text{Cr}^{2+}/\text{Mn}^{3+}$
- d) $\text{Fe}^{2+}/\text{Mn}^{3+}$

$[\text{}_{24}\text{Cr}, \text{}_{25}\text{Mn}, \text{}_{26}\text{Fe}, \text{}_{27}\text{CO}]$

[62] Which of the following pairs of compounds contain an element that loses one electron from the sublevel d?

- a) $\text{VO}_2 / \text{ScCl}_3$
- b) $\text{MnO}_3 / \text{Ti}_2\text{O}_3$
- c) $\text{CuSO}_4/\text{FeCl}_3$
- d) CoO_2/CuO

[63] Element A from third transition series its configuration in atomic state ended by d^2 , so the configuration of the element above it in the same column in oxidation state 2+:

- a) $5d^0$
- b) $4d^0$
- c) $3d^0$
- d) $4d^2$

[64] An ion of transition element X^{3+} its electronic configuration is $[\text{}_{18}\text{Ar}]$, find. number of unpaired electron in (d) sublevel of its atom.

- a) 1
- b) 2
- c) 3
- d) 4

[65] Main transition element (X), its configuration in oxidation state: X^{3+} : $[_{36}Kr]$

SO position of (X) in periodic table

- a) period no. 4 group no. IIIB
- b) period no. 5 group no. IIIA
- c) periodno.5 groupno.IIIB
- d)period no. 3 group no. IIIB

[66]X,Y,Z& Mare four transition elements found in the same series in periodic table, giventhat:

Atom or ion	Configuration
X^0	$ns^1,(n-1)d^{10}$
Y^{2+}	$ns^0,(n-1)d^5$
Z^{3+}	$ns^0,(n-1)d^3$
M^{4+}	$ns^0,(n-1)d^0$

So their order in periodic table in their period from left to right :

- a) Y,X,M,Z
- b) M,Z,Y,X
- c) Z,M,X,Y
- d) X,Y,Z,M

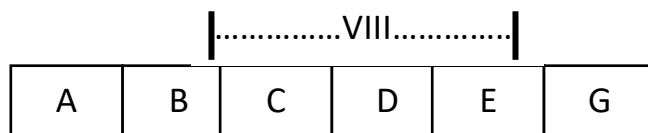
[67]Transition element X can form a compound X_2O . The general electronic configuration of the column containing element X is

- a) $ns^2,(n-1)d^{10}$
- b) $ns^2,(n-1)d^1$
- c) $ns^1,(n-1)d^{10}$
- d) $ns^2,(n-1)d^9$

[68]one of the following is the most stable ion.....

- a) Chromium II ion.
- b) Vanadium IIion.
- c) Iron II ion.
- d) Copper I ion.

[69] In this shape a part of one of transition series:



Element that its ion of oxidation state 2+ is more energy than 3+

- a) C
- b) D
- c) E
- d) B

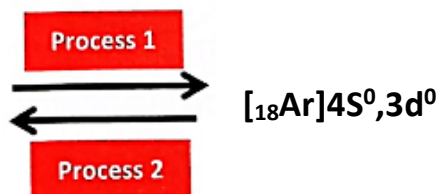
[70] Main transition element (X) in third transition series, found in group IVB, so the most stable ion for it:

- a) X^{2+}
- b) X^{3+}
- c) X^{4+}
- d) all the previous are correct

[71] An element X that is located in the eighth vertical column of the periodic table. The formula of its more stable oxide is

- a) XO
- b) XO₂
- c) X₂O₃
- d) X₂O₅

[72] Which process is easier $[_{18}\text{Ar}]4s^2, 3d^1$



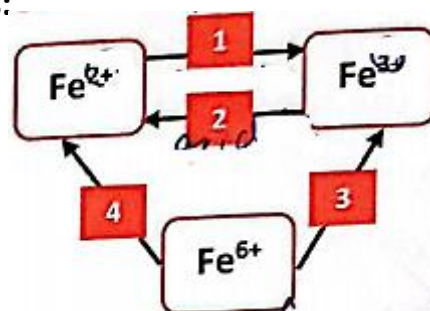
- a) process 1
- b) process 2
- c) a & b are correct
- d) a & b are incorrect

[73] (2020 1st session) Element X from the first transition series and it is difficultly reduced from X^{3+} to X^{2+} in normal conditions so the element X is

- a) Fe
- b) Mn
- c) CO
- d) Ni

[74] In this shape the arrow refers to easy reduction process is:

- a) 1
- b) 2
- c) 3
- d) 4



[75] If you have in your laboratory, two bottles as in figure & one cover only, which bottle of them X or Y should be covered to keep its solution against changing,:



- a) X, should be covered
- b) Y should be covered
- c) both (X) & (Y) should be covered
- d) neither (X) nor (Y) should be covered

[76] compound contains an element in its maximum oxidation is this compound could be an oxidizing agent than being a reducing agent.

- a) more
- b) less
- c) equal
- d) slightly less

[77] All The following compounds can act as oxidizing agents & also reducing agents in chemical reactions except

- a) FeO
- b) MnO_2
- c) Cr_2O_3
- d) V_2O_5

[78] Number of elements in 1st transition series have oxidation state is 2+ is.....

- a) 10
- b) 4
- c) 1
- d) 9

[80] One of the following elements considered as transition element.

- a) $_{11}\text{Na}$
- b) $_{18}\text{Ar}$
- c) $_{79}\text{Au}$
- d) $_{80}\text{Hg}$

[81] The number of elements in 1st transition series that all its orbitals

completely filled in atomic state equal

- a) 0 b)1 c)2 d) 3

[82] the number of transition elements.in 1st transition series that all its orbitals completely filled.in atomic state equal.....

- a) 0 b)1 c)2 d) 3

[83] Transition element exists in period four so , the electronic configuration of M⁺ ion is

- a) [₁₈Ar]3d¹⁰
 b) [₁₈Ar],4s¹,3d¹⁰
 c)[₁₈Ar]3d⁹
 d) [₁₈Ar],4s¹,3d⁹

[84] Oxidation state 3+ for coinage metals d orbitals contains unpaired Electrons

- a) 1 b)2 c)3 d) 4

[85] (2020 trial exam 2) The element (X) is a one of the coinage transition elements , the compounds which proves that it is a transition elements are

- a) X₂O₃,X₂O b)XCl,XO c)X₂O₃,XO d) X₂O₃,XCl

[86] The last transition element of period 6 is located in group

- a) IVB b)VIIIB c)IB d) IIB

[87] The element (X) with electronic configuration in its atomic state is (6s¹ ,5d¹⁰) & it can form compound XCl₃ , so (X) is ...

- a) Transition element because the 3d orbital is completely filled
 b) Transition element because the 3d orbital is incompletely filled in 3+ oxidation state
 c) Not Transition element because the 3d orbital is completely filled in atomic state
 d) Transition element because orbital 5d is occupied , and not completely filled in some oxidation states

[88] Elements of 2nd transition series are different than elements of 1st transition series in

- a) number of transition elements in each series.
- b) number of elements which have anomalous electronic configuration.
- c) the sublevel filled gradually in the elements of each series.
- d) presence of inner transition elements among the elements of the series

[89] The d-metals can be mixed together to form many alloys because.....

- a) the d-electrons interact strongly with each other.
- b) the d-metals have a wide range of metal radii
- c) the nucleus is well shielded by the d-electrons
- d) the range of d-metal radii is not very great

[90] The correct order according to density :

- a) $_{29}\text{Cu} >_{21}\text{SC} >_{25}\text{Mn}$
- b) $_{21}\text{Cu} >_{25}\text{SC} >_{29}\text{Mn}$
- c) $_{21}\text{Cu} >_{25}\text{SC} >_{29}\text{Mn}$
- d) $_{25}\text{Cu} >_{29}\text{SC} >_{21}\text{Mn}$

[91] In the 1st transition series from left to right each element increases by one electron more added to 3d sublevel, these extra electrons added cause:

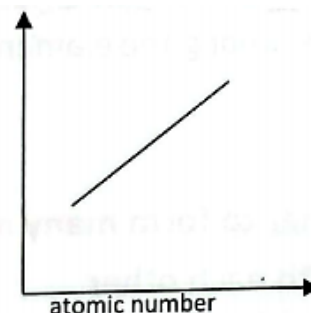
- a) increasing only repulsion among electrons so atomic radius increases.
- b) increasing only attraction between nucleus & electrons so atomic radius decreases
- c) both a & b are incorrect so the atomic radius kept nearly constant
- d) both a & b are correct so the atomic radius kept nearly constant

[92] A & B are two non-successive elements from the same transition series, if density of A > B, so.....

- a) Maximum oxidation state for A should be greater than that of B
- b) Maximum oxidation state for B should be greater than that of A ;
- c) a & b are probable answers
- d) a & b are impossible answers

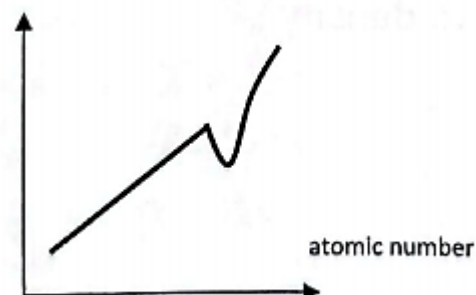
[93] Which of the following is related to atomic number of all 3d elements?

- a) atomic radius
- b) atomic mass
- c) density
- d) b& c



[94] Which of the following is related to atomic number of all 3d elements?

- a) atomic radius
- b) atomic mass
- c) density
- d) b& c



[95] Three elements (x, Y&Z) are located in beginning of the first main transition series and can be arranged according to their atomic radii as following $X < Y < Z$.

Which of the following statements is true?

- a) Atomic number of element Z is larger than that of the element Y
- b) The density of the element X is larger than that of the element Z
- c) Number of unpaired electrons in the element Z is larger than that in the element X
- d) All the three elements (X, Y & Z) are equal in their densities

[96] ${}_{39}\text{X}$, ${}_{45}\text{Y}$, ${}_{48}\text{Z}$ are 3 metals

- a) (Z) is a transition element from the 2nd series.
- b) mass of (Z) is greater than (X) if their volumes are equal
- c) (X) cannot react with water
- d) all the previous are correct

[97] All the transition elements share these properties except

- a) have low melting point
- b) Good conductor for the heat & electricity
- c) All of them are solids
- d) The decreasing in the atomic radii is small in each series

[98] From the following table,

Choose the correct one?

- a) $A < B < D$ in number of oxidation state
- b) $C < B < D$ in maximum oxidation state
- (c) $A < B < D$ in chemical activity
- (d) $D < B < A$ in chemical activity

Atom or ion	Electronic configuration
A	$[_{18}\text{Ar}]3d^{10}$
B³⁺	$[_{18}\text{Ar}]$
C	$[_{18}\text{Ar}]4s^2 3d^{10}$
D²⁺	$[\text{Ar}]3d^5$

[99] (X) is a transition element from 1st series, react with water as the following



- a) configuration of X in $ns^2, (n - 1) d^1$
- b) oxidation state for X in the product is 3+
- c) elements follow X in its series cannot perform this reaction due to decreasing chemical activity
- d) all the previous are correct

[100] The electronic configuration of element Y is $[_{36}\text{Kr}] 5s^2 4d^1$ which of the following represents the chemical equation between element Y and water .

- a) $Y + 2 \text{H}_2\text{O} \rightarrow Y(\text{OH})_2 + \text{H}_2$
- b) $2Y + 6 \text{H}_2\text{O} \rightarrow 2Y(\text{OH})_3 + 3\text{H}_2$
- c) $2Y + 2\text{H}_2\text{O} \rightarrow 2Y\text{OH} + \text{H}_2$
- d) $Y + \text{H}_2\text{O} \rightarrow$ no reaction

[101] The electronic configuration of element X is $[_{18}\text{Kr}] 5s^1 4d^{10}$ which of the following represents the chemical equation between element X and water.

- a) $2X + 6 \text{H}_2\text{O} \rightarrow 2X(\text{OH})_3 + 3\text{H}_2$
- b) $X + 2 \text{H}_2\text{O} \rightarrow X(\text{OH})_2 + \text{H}_2$
- c) $2X + 2 \text{H}_2\text{O} \rightarrow 2X\text{OH} + \text{H}_2$
- d) $X + \text{H}_2\text{O} \rightarrow$ no reaction

[102] (2020 1st session) The transition elements that has the highest boiling point and electronic configuration of its ion is $[_{18}\text{Ar}]$, so its ion is

- a) W^{2-}
- b) X^{3+}
- c) Y^{1+}
- d) Z^{1-}