# CHEMISTRY

# BOOKS - V PUBLICATION

# CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES

## Question Bank

**1.** What is the basic theme of organization in the periodic table?

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**2.** Which important property did Mendeleev use to classify the elements in his periodic table and did he stick to that?

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**3.** What is the basic difference in approach between the Mendeleevs Periodic Law and the Modern Periodic Law?

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**4.** On the basis of quantum numbers justify that the sixth period table should have 32 elements.

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**5.** In terms of period and groups where would you locate the element with Z = 114 ?

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**6.** Write the atomic number of the element in the third period and group 17 of the period table.

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**7.** Which element do you think would have been named by

Lawrence Berkeley laboratory.

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**8.** Why do elements in the same group have similar properties ?


**9.** What does atomic radius and ionic radius really mean to you?

**10.** What does atomic radius and ionic radius really mean to you?

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**11.** What do you understand by isoelectronic species?Name a species that will be isoelectronic with each of the following atoms or ions.

i. 'F^-'

ii. 'A r'

iii. ' M g^(2+)'

iv. 'R b^+'

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**12.** $N^{3-}, O^{2-}, F^{-}, Na^{+}, Mg^{2+}, Al^{3+}$ what is comman in them ?

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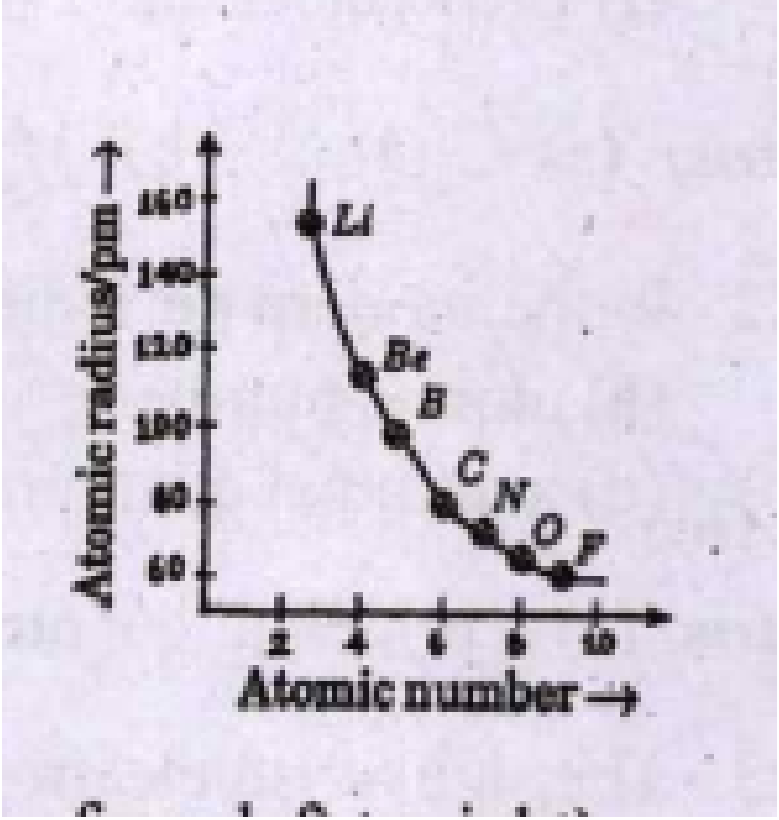
**13.** A graph of aromic radius versus atomic number is given blow: Account for the

observation that cations are always smaller than the parent atom while anions are always smaller the parent atom.

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**14.** What is the significance of the terms - isolated gaseous atom and ground state while defining the ionization enthalpy and electron gain enthalpy?

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**15.** Energy of an electron in the ground state of hydrogen atom is $-2.18 \times 10^{-18} J$. Calculate the inoisation enethalpy of atomic hydrogen in $Jmol^{-1}$.

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**16.** Among the second period elements the actual ionisation enthaply are in the order $Li < B < Be < C < O < N < F < Ne$. Expalin why Be has higher $\Delta IH$ than B.

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**17.** How would you explain that the first ionisation energy of Na is lawer than that of

Mg but is second inoisation enthalpy is higher than that of Mg ?

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**18.** What are the main factors due to which the ionisation enthalpy of the main group elements tends to decrease down a group ?

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**19.** The first IE $\left(Kjmol^{-1}\right)$ of group 13 elements are

$$\frac{B}{801}A\frac{l}{577}G\frac{a}{579}I\frac{n}{558}T\frac{l}{589}$$

How would you explain the deviation from general trend ?

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**20.** Which of the following pairs would have more negative electron gain enthalpy ? F or Cl

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**21.** Would you expect the second electron gain enthalpy O as positive, more negative or less negative than the first ? Justify your answer.

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**22.** What is the basic difference between the terms electron gain enthalpy and electronegativity?

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**23.** How would you react to the statement that the electron(eg)ativity of 'N' on Pauling scale is '3.0' in all the nitrogen compounds?

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**24.** Discribe the theory associated with the radius of an atom as it gains an electron

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**25.** Would you expect the first IE of two isotopes of the same elements to be the same or different ? Justify the answer.

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**26.** What are the mojor differece between metals and non metals ?

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**27.** Use the periodic table to answer the.following questions?

a. Identify an element with five electrons in the outer subshell.

b. Identify an element that would tend to lose two electrons.

c. Identify an element that would tend to gain two electrons.

d. Identify group having metal, non-metal, liquid as well as gas at the room temperature.

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**28.** The inceasing order of reactivity among group 1 elements is $Li < Na < K < Rb < CS$ whereas that among group 17 is $F > Cl > Br > I$. Explain .

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**29.** Write the general outer electronic configuration of 's', 'p, d' and 'f' block elements.

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**30.** Assign the position of the element having outer electronic configuration

i. 'n s^2 n p^4' for 'n=3'

ii. '(n-1) d^2 n s^2' for 'n=4', and

iii. '(n-2) f^7(n(-1)) d^1 n s^2' for 'n=6', in the periodic table.

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**31.** The first IE and second IE $\left(Kjmol^{-1}\right)$ and $da < a_e gH\left(kJmol^{-1}\right)$ of a few elements are

given below:

| Element | $IE_1$ | $IE_2$ | $\Delta_{eg}H$ | Element | $IE_1$ | $IE_2$ | $\Delta_{eg}H$ |
|---|---|---|---|---|---|---|---|
| I | 520 | 7300 | −60 | IV | 1008 | 1846 | −295 |
| II | 419 | 3051 | −48 | V | 2372 | 5251 | +48 |
| III | 1681 | 3374 | −328 | VI | 738 | 1451 | −40 |

Which of the above is likely to be the least reactive element

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**32.** Predict the formulae of stable binary compounds that would be the formed by the combination of following pairs of elements. Li and `O

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**33.** In the modern periodic table, the period indicates the value of

A. atomic number

B. atomic mass

C. principal quantum number

D. azimuthal quantum number

**Answer: C**

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**34.** Which of the following statements related to the modern periodic table is incorrect?

A. The p-block has 6 columns, because a maximum of 6 electrons occupy all the orbitals in a p-shell.

B. The d-block has 8 columns, because a maximum of 8 electrons can occupy all the orbitals in a d-subshell.

C. Each block contains a number of columns equal to the number electrons that can occupy that subshell.

D. The block indicates value of azimuthal quantum number (l) for the last subshell that received electrons in building up the electronic configuration.

**Answer: B**

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**35.** Anything that influences the valence electrons will affect the chemistry of the element. Which one of the following factors does not affect the valence shell? (1)Valence principal quantum number(n) (2)Nuclear charge(Z) (3)Nuclear mass (4)Number of core electrons

A. Valence principal quantum number (n)

B. Nuclear charge (Z)

C. Nuclear mass

D. Number of core electrons.

**Answer: D**

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**36.** The size of iso electronic species $F - Ne$ and $Na^+$ is affected by

A. nuclear charge (Z)

B. valence principal quantum number (n)

C. electron-electron interaction in the outer orbitals

D. none of the factors because their size is the same.

**Answer: A**

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**37.** Which one of the following statements is incorrect in relation to ionization enthalpy? (1)Ionization enthalpy increases for each successive electron.(2)The greatest increase in ionization enthalpy is experienced on removal

of electron from core noble gas configuration (3)End of valence electrons is marked by a big jump in ionization enthalpy (4)Removal of electron from orbitals bearing lower n value is higher than from orbital having higher 'n' value.

A. Ionization enthalpy increases for each successive electron.

B. The greatest increase in ionization enthalpy is experienced on removal of

electron from core noble gas configuration.

C. End of valence electrons is marked by a big jump in ionization enthalpy.

D. Removal of electron from orbitals bearing lower n value is pasier than from orbital having higher 'n' value.

**Answer: A**

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**38.** Considering the elements B,Al,Mg and K, the correct order of their metallic charcter is

A. BgtA lgtM ggtK'

B. Algt MggtBgtK'

C. MggtAlgtKgtB'

D. KgtM ggtA lgtB'

**Answer: D**

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**39.** Considering the elements, 'B, C, N, F', and 'Si', the correct order of their non-metallic character is,

A. $B > C > Si > N > F$

B. $Si > C > B > N > F$

C. $F > N > C > B > Si$

D. $F > N > C > Si > B$

**Answer: C**

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**40.** considering the elements F,Cl, O and N, the correct order their chemical reactivity in terms of oxidising property is

A. FgtClgtOgtN'

B. FgtOgtC lgtN'

C. ClgtFgtOgtN'

D. OgtFgtNgtC l'

**Answer: A**

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**41.** Atomic numbers of two elements 'A' and 'B' are 31 and 41 respectively. Identify their group and period in the long form of the periodic table.

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**42.** A group of ions are given below:

$Na^+$, $Al^3+$, $O^2-$, $Ca^2+$, $Mg^2+$, $F^-$, $N^3-$, $Br^-$

a) Find the pair which is not isoelectronic.

b) Arrange the above ions in the increasing order of size.

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**43.** Which of the following will have the most negative electron gain enthalpy and which the least negative ?

P,S,Cl,F. Explain your answer.

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**44.** Predict the formulae of compounds which might be formed by the following pairs of elements (a) silicon and bromine (b) aluminium and sulphur.

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**45.** The elements $Z = 107$ and $Z = 109$ have been made recently, element $Z = 108$ has not yet been made. Indicate the groups in which you will place the above elements.

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**46.** Two elements Cand D have atomic numbers 36 and 58 respectively. On the basis of electronicconfiguration predict the following:

i. The group, period and block to which each element belongs.

ii. Are they representative elements?

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**47.** Which of the following species will have the largest and the smallest size ? $Mg, Mg^{2+}, Al, Al^{3+}$.

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**48.** The first ionization enthalpy (IE) of the third period elements 'Na, M g', and 'S i' are respectively 496,737 and '786(kJ mol^(-1)) .' Predict whether the first 'IE' value for 'Al' will

be more close to 575 or '760 kJ' mol '^(-1)'. Justify your answer.

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**49.** Show by a chemical reaction with water that 'Na_2 O' is a basic oxide and 'Cl_2 O_7' is an acidic oxide.

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**50.** Among the elements $B$, $Al$, $C$ and $Si$.

a. Which has the highest first ionization enthalpy?

b. Which has most negative electron gain enthalpy?

c. Which has the largest atomic radius?

d. Which has the most metallic character?

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**51.** Electron gain enthalphy is the amount of energy involved when an isolated gaseous atom accepts an electron to form a monovalent anion

the value of the electron gain enthalpy of halogens are given below:

F : `-328 KJ mol^(-1) Cl - 349 KJ mol^(-1) Br : -325 KJ mol^(-1) I : -295 KJ mol^(-1)Chlorine has more negative electron gain enthalpy than fluorine. why ?

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**52.** Do elements with high I.E. have E.A.?

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**53.** Why does the first ionization enthalpy increase as we go from to across a given period of the Periodic Table?

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**54.** How does covalent radius vary across a period?

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**55.** Electronic configuration of a few etements are given below. Identify the group and period to which they belong?

(i) '[Ne] 3 s^2 3 p^5'

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**56.** Match the following

'(##VPU_HSS_CHE_XI_C03_E02_016_Q01##)'

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**57.** Based on the long form of periodic table match the following:

'(##VPU_HSS_CHE_XI_C03_E02_017_Q01##)'

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**58.** Development of priodic table have made the study of elements and their compounds easiere Give the name of the element with otomic number 112

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**59.** Account for the following: Ionisation enthalphy of nitrogen is greater than that of oxygen

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**60.** Ionisation is the removal of electron from an.atom. What is ionisation enthalpy? How is it related to electronic configuration of atoms.

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**61.** Name a +ve ion which is isolectronic with 'F-'.

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**62.** In periodic table '3^(rd) ' period contains eight and not eighteen elements. Justify.

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**63.** A graph is given below. Analyse the graph and answer the questions. a. What is the trend of atomic radius in this group?

'(##VPU_HSS_CHE_XI_C03_E02_025_Q01##)'

b. How can we use the graph to predict the trend of 'Li, H' in this group?

c. How can we use the graph to study the reactivity of elements of the group?

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**64.** A group of ions are given below:

$Na^+$, $Al^3+$, $O^2-$, $Ca^2+$, $Mg^2+$, $F^-$, $N^3-$, $Br^-$

a) Find the pair which is not isoelectronic.

b) Arrange the above ions in the increasing order of size.

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**65.** Nitrogen has the electronic configuration '1 s^2 2 s^2 p_x^1 2 p_y^1 2 p_z^1' and not '1 s^2 2 s^2 2 p_x^2 2 p_y^1 2 p_z^0' which is determined by

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**66.** The electron gain enthalpy values of halogens become more negative in the order:

$F > Cl > Br > I$

Comment on the statement.

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**67.** Choose the electronic configurations that are possible from among the following. Explain why the others are impossible.

a '1 s^2 2 s^3 2 p^6'

b '1s^2 2 s^2 2 p^4'

C '1 s^2 2 s^2 2 p^8 3 s^2 3 p^6 3 d^7'

d '1 s^2 2 s^2 2 p^6 3 s^2 3 d^9'

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**68.** Which of the following species will have the largest and the smallest size ? $Mg, Mg^{2+}, Al, Al^{3+}$.

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**69.** Give justification, The first lonisation enthalpy of carbon is greater than that of boron, whereas the reverse is correct for the second ionisation enthalpy.

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**70.** A student reported the radii of 'Al^(3+), Mg^(2+)' and 'F' as '136 pm, 65 pm' and '50 pm' respectively. Is the order correct? Comment.

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**71.** Elements A, B, C, D and E have the following electronic configuration:

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

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

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

D : $1s^2 2s^2 2p^6 3s^2 3p^5$

which among these will belong to the same group in the periodic table?

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**72.** Why has the zero group been placed at the extreme of the periodic table?

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**73.** Arrange the following ions in order of decreasing ionic radii : 'Li^(2+), He^+, Be^(3+)'

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**74.** To which block ($s$, $p$, $d$ or $f$ ) does the element with atomic number 50 belong?

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**75.** Can an element with atomic number 126, if discovered be accommodated in the present set up of the long form of the periodic table?

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**76.** Arrange the following in decreasing order of their van der Waals radii : 'Cl, H, O, N'

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**77.** Among the elements $B$, $Al$, $C$ and $Si$.

a. Which has the highest first ionization enthalpy?

b. Which has most negative electron gain enthalpy?

c. Which has the largest atomic radius?

d. Which has the most metallic character?

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**78.** Give justification, The first lonisation enthalpy of carbon is greater than that of boron, whereas the reverse is correct for the second ionisation enthalpy.

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**79.** i. Predict my group. My characters are

a. electrons in my hand are just enough for me.

b. I am a gas.

c. At ordinary temperature and pressure, I dont like to react with other gases.

ii. Sodium is an element in the first group. Write the ğeneral characters of this element.

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**80.** A cation is smaller than the corresponding neutral atom while an anion is larger. Justify.

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**81.** State the modern periodic law

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**82.** The modern periodic table is based on:- variation of densities, variation of electronic

structure, variation of melting point, variation of size of atoms

A. variation of densities

B. variation of electronic structure

C. variation of melting point

D. variation of size of atoms

**Answer: B**

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**83.** The elements which form coloured ions and show paramagnetism are: Alkali metals , Alkaline earth metals , Halogens , Transition elements.

A. Alkali metals

B. Alkaline earth metals.

C. Halogens.

D. Transition metals,

**Answer: D**

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**84.** Which among the following is isoelectronic with $NH_3$ ? $CH_4, CO^+, CH_3$

A. CH_4'

B. CO^+'

C. CH_3'

D. mathcalC overlineN'

**Answer: A**

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**85.** Which is the correct order with réspect to the first ionisation potential? $K > Na > Li$, $Ar > Ne > He$, $Be > Mg > Ca$, $Ge > Si > C$

A. KgtNagtLi'

B. ArgtN(eg)tHe'

C. Be .gtMggtCa'

D. G(eg)tSigtCa'

**Answer: C**

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**86.** The electronegativity of elements from left to right in a period of periodic table.

A. Increases

B. Decreases

C. Remains the same

D. Changes irr(eg)ularly

**Answer: A**

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**87.** Which element has smallest size?

A. B

B. N

C. Al

D. P

**Answer: B**

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**88.** The family of elements with the highest ionisation enthalpy:

A. alkaline earth metals

B. halogens

C. noble gases

D. alkali metals

**Answer: C**

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**89.** Which of the following has largest negative electron gain enthalpy?

A. F

B. Cl

C. Br

D. I

**Answer: B**

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**90.** Which one of the following elements belongs to the family of elements that includes the element chlorine?

A. Astatine

B. Rubidium

C. Tungsten

D. Cerrium

**Answer: A**

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**91.** The anion $O^-$ is isoelectronic with $N^{2-}$, $F^-$, $N^{3-}$, $Ne$

A. N^(2-)'

B. F^-'

C. N^(3-)'

D. Ne

**Answer: A**

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**92.** Which of the following is not a transition metal? Silver, Lead, Tungsten, Manganese

A. Silver

B. Lead

C. Tungsten

D. Manganesè

**Answer: B**

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**93.** The ionic size of $Na^+$, $Mg^{2+}$, $Al^{3+}$ and $Si^{4+}$ follows the order:

$Na^+ < Mg^{2+} < Al^{3+} < Si^{4+}$,

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

$Na^+ > Mg^{2+} < Al^{3+} < Si^{4+}$,

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

A. 'Na^+ltMg^(2+)ltAl^(3+)ltSi^(4+)'

B. Na^+gtMg^(2+)gtAl^(3+)gtSi^(4+)'

C. Na^+gtMg^(2+)ltAl^(3+)ltSi^(4+)'

D. Na^+ltMg^(2+)gtAl^(3+)gtSi^4,+'

**Answer: B**

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**94.** Amongst the following elements (where electronic configurations are given below), the one having the highest ionisation enthaipy is 'therefore' [Ne]$3s^2 3p^1$, [Ne]$3s^2 3p^3$, [Ne] $3s^2 3p^2$, [Ne] $3d^{10} 4s^2 4p^2$

A. [Ne] 3 s^2 3 p^1'

B. [Ne] 3 s^2 3 p^3'

C. [Ne] 3 s^2 3 p^2'

D. [Ne] 3d^10 4 s^2 4 p^2'

**Answer: B**

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**95.** The penetration of the electrons in any principal shell varies as: $s > p > d > f$, $s < p < d < f$, $s > p < d > f$, $s < p > d > f$

A. sgtpgtdgtf'

B. sltpltdltf'

C. sgtpltdgtf'

D. sltpgtd .gtf'

**Answer: A**

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**96.** Which of the following oxide is most acidic?

A. BeO

B. MgO

C. CaO

D. BaO

**Answer: A**

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**97.** element, Meitnerium '(Z=109)' belongs to :

A. s-block

B. p-block

C. d-block

D. f-block

**Answer: C**

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**98.** Which one of the following processes proceeds with the absorption of energy?

$F(g) + e^- \rightarrow F^-(g), F(g) + e^- \rightarrow F^-(g),$

$O(g) + e^- \rightarrow O^-(g),$

$Cl(g) + e^- \rightarrow Cl^-(g)$

A. F(g)+e^- rarr F^-(g)'

B. O^-(g)+e^- rarr O^(2-) .(g)'

C. O(g)+e^- rarr . O^-(g)'

D. Cl(g)+e^- rarr Cl^-(g)'

**Answer: B**

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**99.** Which of the following statement is, correct?

A. 1 st ' and '2 nd ' IE of nitrogen is more than '1 st ' and '2 nd '. IE of oxygen

B. IE of oxygen is greater than IE of nitrogen

C. IE_2' of oxygen is greater than 'IE_2' of nitrogen: .

D. áll statements are correct.

**Answer: C**

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**100.** Ionization enthalpy of lithium is $520kJmol^{-1}$. How much enthalpy in jọules must be needed to convert all atoms of Li to $Li^{+}$ ions present in $7mg$ of Li vapours. $74.3kJ$ , $520 \times 6.023 \times 10^{-17}J, 520J, 780J$

A. 74.3 kJ'

B. 520 xx 6.023 xx 10^(-17)J'

C. 520 J'

D. 780 J'

**Answer: C**

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**101.** In the second period of the periodic table, ionisation enthalpy follows the order:

$Ne > F > O > N > C > B > Se > Li.$,

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

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

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

A. 'N egtFgtOgtNgtCgtBgtS egti \dotL'

B. 'NegtFgtNgtCgtOgtBegtBgtLi'

C. 'LigtBgtBegtCgtOgtNgtFgtNe'

D. 'NegtFgtNgt0gtCgtBegtBgtLi'

**Answer: D**

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**102.** Which of the following configuration is expected to have maximum difference in second and third ionsation enthalpies? $1s^2 2s^2 2p^2$, $1s^2 2s^2 2p^6 3s^1$, $1s^2 2s^2 2p^6 3s^2$, $1s^2 2s^2 2p^1$

A. 1 s^2 2 s^2 2 p^2'

B. 1s^2 2 s^2 2 p^6 3 s^1'

C. 1s^2 2 s^2 2 p^6 3 s^2'

D. 1s^2 2 s^2 2 p^1'

**Answer: A**

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**103.** Element with atomic number 56 belongs to which block?

A. s

B. p

C. d

D. f

**Answer: A**

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**104.** The ionic radii of isoelectronic species 'N^(3-), O^(2-)' and 'F^-' in 'A^0' are in the order

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'

**Answer: C**

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**105.** The ions 'O^(2-), F^-, Na, Mg^(2+)' and 'Al^(3+)' are isoelectronic. Their radii show:

A. an increase from 'O^(2-)' and 'F^-' and then decreases from 'Na^+' to 'Al^(3+)'

B. a decrease from 'O^(2-)' to 'F^-' and then increase from 'Na^+' to 'Al^(3+)'

C. a significant increase from 'O^2' to 'Al^(3+)'

D. a significant decrease from 'O^(2-)' to 'Al^(3+)'

**Answer: D**

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**106.** Which of the following grouping represents a collection of isoelectronic species (At. No : 'Cs=55, Br=35' )

A. N^(3-), F^-, Na^+'

B. 'Be, Al^(3+), Cl^-'

C. Ca^(2+), Cs^+, Br'

D. Na^+, Ca^(2+), Mg^(2+)'

**Answer: A**

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**107.** Ionic radii are

A. inversely proportional to square of effective nuclear charge

B. directly proportional to effective nuclear charge.

C. directly proportional to square of effective nuclear charge.

D. inversely proportional to effective nuclear charge.

**Answer: D**

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**108.** Which of the following ions has the highestvalue of ionic radius?

A. O^(2-)'

B. B^(3+)'

C. Li^+'

D. F^-'

**Answer: A**

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**109.** Which one of the following sets of ions represents the collection of isoelectronic species?

A. 'K^+, Cl^-, Mg^(2+), Sc^(3+)'

B. Na^+, Ca^(2+), Sc^(3+), F^-'

C. K^+, Ca^(2+), Sc^(3+), Cl^-'

D. Na^+, Mg^(2+), Al^(3+), Cl^-'

**Answer: C**

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**110.** elements with atomic no '9,17,35,53' and 85 are all

A. noble gases.

B. halogens

C. heavy metals

D. light metals

**Answer: B**

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**111.** In a given shell, the order of screening effect is

A. sgtpgtdgtf'

B. 'fgtdgtpgts'

C. pgtdgtsgtf'

D. dgtfgtsgtp'

**Answer: A**

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**112.** For electron affinity of halogens, which of the following is correct?

A. BrgtF'

B. FgtCl'

C. Br gt Cl

D. FgtI'

**Answer: D**

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**113.** elements with atomic no '9,17,35,53' and 85 are all

A. noble gas

B. halogens

C. heavy metals

D. light metals

**Answer: B**

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**114.** In a given shell, the order of screening effect is

A. sgtpgtdgtf'

B. fgtdgtpgts'

C. pltdltsltf'

D. dgtfltsltp'

**Answer: A**

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**115.** Consider the ions: 'K^+, S^(2-), Cl^-' and 'Ca^(2+) .' The radii of these ionic species follow the order:

A. Ca^(2+)gtK^+gtCl^-gtS^(2-)'

B. Cl^-gtS^(2-)gtK^+gtCa^(2+)'

C. Ca^(2+)gtCl^-gtK^+gtS^(2-)'

D. K^+gtS^(2-)gtCl^-gtCa^(2+)'

**Answer:**

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**116.** Which of the following have no unit?

A. elcctron(eg)ativity

B. electron affinity

C. ionisation energy

D. excitation potential

**Answer: A**

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

A. Al^(3+)ltMg^(2+)ltNa^+ltF' Increasing ionic size

B. BltCltNltO^circ' Increasing first ionization enthalpy

C. 1ltBrltFltCl' Increasing electron gain enthalpy with n(eg)ative sign

D. 'LiltNaltKltRb' Increasing metallic radius

**Answer: B**

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**118.** Which of the following is not an actinide?

A. curium

B. californium

C. uranium

D. terbium

**Answer: D**

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**119.** Europium is

A. s-block element

B. p-block element

C. d-block element

D. f-block element

**Answer: D**

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**120.** Which one of the following arrangements represents the correct order of electron gain enthalpy (with n(eg)ative sign) of the given atomic species?

A. FltCllltOltS'

B. SltOltCllltF'

C. OltSltFltCl'

D. CllltFltSltO'

**Answer: D**

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**121.** In the following, the element with the highest ionization energy is

A. [Ne] 3 s^2 3 p^1'

B. [Ne] 3 s^2 3 p^3'

C. [Ne] 3 s^2 3 p^2'

D. [Ne] '3 s^2 3 p^4'

**Answer: B**

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**122.** One mole of magnesium in the vapour state absorbed 1200 kJ 'm o l^(-1)' of energy. If the first and second ionization energies of 'Mg' are 750 and '1450 kJ mol^(-1)' respectively, the final composition of the mixture is

A. 31 % Mg^++69 % Mg^(2+)'

B. 69 % Mg^++31 % Mg^(2+)'

C. 86 % Mg^++14 % Mg^(2+)'

D. 14 % Mg^++86 % Mg^(2+)'

**Answer: B**

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**123.** Which of the following sets of ions represents a collection of isoelectronic species?

A. N^(3-), O^(2-), F^-, S^(2-)'

B. Li^+, Na^+, Mg^(2+), Ca^(2+)'

C. K^+, Cl^-, Ca^(2+), Sc^(3+)'

D. Ba^(2+), Sr^(2+) _2 K^+, Ca^(2+)'

**Answer: C**

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**124.** The increasing order of the first ionization enthalpy of the elements $B, P, S$ and $F$ (lowest first) is $B < P < S < F$, $B < S < P < F$, $F < S < P < B$, $P < S < B < F$,

A. 'BltPltSltF'

B. BltSltPltF'

C. FltSltPltB'

D. PltSltBltF'

**Answer: B**

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