



# CHEMISTRY

## BOOKS - JEEVITH PUBLICATIONS CHEMISTRY (KANNADA ENGLISH)

### CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES

#### One Mark Questions And Answers

1. Define atomic radius.



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2. Define classification of element.



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3. Define ionic radius.



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4. What is Groups?



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5. Why ionisation potential of inert gases comparatively higher ?



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6. Among  $Na^+$ ,  $Al^{+3}$  which is having smallest size ?



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7. Which has got smallest size

$Fe$ ,  $Fe^{+2}$  &  $Fe^{3+}$  ?



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8. What is periods ?



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9. Alkali metals have low ionization energy why

?





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10. State Mendeleev periodic law ?



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11. What is ionization energy ? How does it change in a period as well as in a group ?



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**12.** What are the uses of Mendeleev periodic law ?



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**13.** Who gave modern periodic law by observing X - ray spectra of element .



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**14.** What is periodicity ?



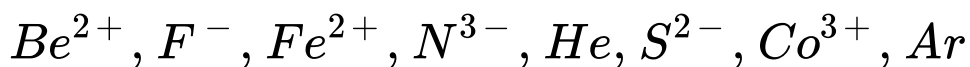
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15. What is meant by electro negativity of an atom ?



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16. Group the following species that are isoelectronic.



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17. Which one has the larger size :

$Fe^{2+}$  or  $Fe^{3+}$  ?



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18. State the modern periodic law.



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**19.** Name the element which is most electronegative , and the element which is least electronegative in the periodic chart.



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**20.** Write the general outer electronic configurations of the following elements.

alkali metals



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21. Write the general outer electronic configurations of the following elements.

alkaline earth metals



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22. Write the general outer electronic configurations of the following elements.

halogens



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**23.** Write the general outer electronic configurations of the following elements.

nobel gases



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**24.** The order of shielding effect for different orbital is  $s > p > d > f$



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25. Alkali metals have low ionization energy

why ?



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26. Which is smallest among

$Na^+$ ,  $Mg^{2+}$ ,  $Al^{3+}$ , and why ?



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27. Which has largest ionic radius among

$Ca^{2+}$ ,  $Mg^{2+}$ ,  $Ba^{2+}$  ?



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28. What is the IUPAC name for the element with atomic number 110.



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**29.** How does electronegativity vary (i) down the group (ii) across the period from left to right ?



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**30.** What is the nature of oxides formed by most of p - block elements ?



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**31.** Which of the following pairs of elements would you expect to have lower first ionization energy ?

(i) Cl or F



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**32.** Which of the following pairs of elements would you expect to have lower first ionization energy ?

Cl or S





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**33.** Which of the following pairs of elements would you expect to have lower first ionization energy?

K or Ar



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**34.** Which of the following pairs of elements would you expect to have lower first ionization



energy ?

Kr or Xe



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**35.** What is the symbol and IUPAC name for the element with atomic number 102.



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**36.** Among Si, P, Cl has smallest radius.



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37. What is  $\Delta$  Heg.



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38. What is valency



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39. What is valence electrons.



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## Two Marks Questions And Answers

1. Among C,N ,B and O which element has the highest ionization potential and which element has the lowest ionization potential .

Give reason.



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2. Which is the most electronegative element and the most electropositive element in the modern periodic table ?



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3. Which of the following two elements belong  
i) the same group ii) same period in the  
periodic table .<sub>4</sub> *Be*,<sub>3</sub> *Li*,<sub>12</sub> *Mg*,<sub>35</sub> *Br*



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4. What is ionization energy ? How does it change in a period as well as in a group ?



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5. What is electron negativity ? How does it change in a period as well as in a group ?



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6. Show that Cl, Br, I is a triad or not ?





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7. To which blocks do the elements with following atomic number belong ? 7,13,25,42



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8. How does covalent radii vary in a period as well as in a group in the periodic table ? What is the reason ?



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9. What are s,p,d and f block elements ?



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10. Give four characteristics of s-block elements.



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11. Give four defects of Mendeleev's periodic table.



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12. Give two reason , why the number of elements in first period is only 2 ?



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13. On the basis of their electronic configurations, explain why alkali metals are highly reactive.



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**14.** Give the order in which the melting points of halides of sodium decrease and why ?



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**15.** Why are group I elements called alkali metals and group 17 are called halogens ?



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**16.** Give four characteristics of d-block elements.



**Watch Video Solution**

**17.** Give any two features of Mendeleev's periodic table.



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**18.** How does the solubility of a solute vary with increase in temperature if the dissolution process is exothermic?



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**19.** Why is melting point of  $\text{LiCl}$  lower than  $\text{NaCl}$  ?



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**20.** Arrange the following in increasing order :

$BeCO_3$ ,  $BaCO_3$ ,  $CaCO_3$ ,  $MgCO_3$  of

Thermal stability



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**21.** Arrange the following in increasing order :

$BeCl_2$ ,  $BaCl_2$ ,  $SrCl_2$ ,  $CaCl_2$  Ionic character.



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**22.** Which alkali metal carbonate is thermally unstable and why ?



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**23.** Out of O and S which has higher negative electron gain enthalpy and why ?



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**24.** Predict which atom in each of the following Period has the highest first ionization energy.



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**25.** Among the elements Li, K, Ca, S and Kr , which one is expected to have the lowest first ionization enthalpy and which one has the highest first ionization enthalpy ?



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**26.** Among the elements of the third period Na to Ar pick out the element:  
with highest first ionization enthalpy



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**27.** Among the elements of the third period Na to Ar pick out the element:  
with largest atomic radius



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**28.** Among the elements of the third period Na to Ar pick out the element that is most reactive non - metal



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**29.** Among the elements of the third period Na to Ar pick out the element that is most reactive metal.



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**30.** Name a species that will be isoelectronic with each of the following atoms or ions:

Ne



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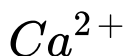
**31.** Name a species that will be isoelectronic with each of the following atoms or ions:

*Cl* <sup>-</sup>



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**32.** Name a species that will be isoelectronic with each of the following atoms or ions:



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**33.** Name a species that will be isoelectronic with each of the following atoms or ions:



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34. Arrange the following ions in the increasing order of their size:



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35. Explain law of octaves.



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36. What are the limitations of law of octaves.



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**37.** Among B, Al , C and Si

Which has the highest first ionization enthalpy



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**38.** Among B, Al , C and Si

which has the largest atomic radius.



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**39.** Arrange the following elements in increasing order of non - metallic character : B, C, Si , N, F .



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**40.** Explain the variation of atomic radius down a group.



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**41.** Explain the variation of atomic radius across a period.



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**42.** Explain the variation of ionic radius down a group and across period.



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**43.** Explain isoelectronic ions with an example.



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**44.** Among  $O$ ,  $O^-$ ,  $O^{2-}$  select a species which has smallest radius and give reason.



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45. Why has smallest  $Sr^{2+}$  radius than and Kr ?



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46. Define electron negativity . How dose it differ electron affinity ?



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47. Name a species that will be is electronic with each of the following atoms or ions"

Ne



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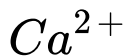
48. Name a species that will be is electronic with each of the following atoms or ions"

$Cl^-$



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49. Name a species that will be is electronic with each of the following atoms or ions"



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50. Name a species that will be is electronic with each of the following atoms or ions"



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51. Give examples of three cation and three anions which are iso electronic with argon.



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**Three Marks More Than 3 Marks**

1. Explain the features that influence/affect the ionization energy.



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2. Explain classification of elements into different blocks in the periodic table.



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3. Explain the law of triads with example.



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4. Briefly explain the account explain the account of groups and periods in long form of

periodic table .



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5. Explain why size of anion is larger than parent atom.



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6. Explain why size of cation is smaller than of the parent atom.



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7. Explain the variation of radii of is electronic species or ions.



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8. Why Fluorine atom has unexpectedly less negative  $\Delta_{eg}$  H than chlorine.



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9. Explain periodicity of valence or oxidation state of s and p block elements.



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10. Arrange the species in each group in order in increasing ionization energy and give reason : (a)  $K^+$ ,  $Cl^-$ ,  $Ar$ , (b) Na, Mg, Al, (c) C, N, O.



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11. What are the factors that affect electron affinity ?



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12. a. Explain why the second ionisation energy of  $B$  is significantly higher than the second ionisation energy of  $C$ , even though the first ionisation energy of  $B$  is less than  $C$ .

b. which has higher 1<sup>st</sup> ionisation energy  $B$  or  $Be$  and why?



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13. a. Explain why the second ionisation energy of  $B$  is significantly higher than the second ionisation energy of  $C$ , even though the first ionisation energy of  $B$  is less than  $C$ .

b. which has higher 1<sup>st</sup> ionisation energy  $B$  or  $Be$  and why?



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**14.** Why fluorine has lesser electron gain enthalpy than chlorine?



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**15.** Give the reasons of the following :

Noble gases tend to be less reactive .



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**16.** Give the reasons of the following :

First ionization enthalpy of Mg is more than that of Na but second ionization enthalpy of Mg is less than that of Na .



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**17.** Account for the following :

$Mg^{+2}$  is smaller than  $O^{-2}$  ion although both have same electronic structure . (ii)

Ionisation enthalpy of nitrogen is more than that of oxygen .



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**18.** Account for the following :

write the IUPAC name and the symbol for the elements with at. no. 118.



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**19.** Some elements are wrongly placed in the decreasing order of the property mentioned. Rectifying the fault, place them in correct order of the property . Also furnish reason for the correction done.

$F > O > N > C$  ( Second ionization potential .



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**20.** Some elements are wrongly placed in the decreasing order of the property mentioned. Rectifying the fault, place them in correct order of the property . Also furnish reason for the correction done.

$N > Si > C > P$  (electronegative of the elements ).



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21. Some elements are wrongly placed in the decreasing order of the property mentioned. Rectifying the fault, place them in correct order of the property . Also furnish reason for the correction done.

$Na > Mg > Al > Si$  ( First ionization potential ).



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