



# CHEMISTRY

## BOOKS - ARIHANT CHEMISTRY (HINGLISH)

### PERIODIC PROPERTIES

#### Practice Exercise

1. Which of the following has firstly organise the elements according to same trend ?

A. Newland

B. Mendeleef

C. Lothar Meyer

D. Dobereiner

**Answer:**



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2. Johann Dobereiner gave the idea of trends among the physical and A... of several groups of three elements. Here, a refers to

A. atomic number

B. atomic mass

C. chemical properties

D. electronic configuration

**Answer:**



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**3.** Lothar Meyer plotted the physical properties such as atomic volume, melting point and A...

Against atomic weight. Here, A refers to

A. mass

B. boiling point

C. surface tension

D. molecules

**Answer:**



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4. Lothar Meyer drew a graph showing the relation between

A. atomic number and atomic weight

B. atomic number and atomic size

C. atomic weight and atomic volume

D. atomic weight and atomic size

**Answer:**



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5. Which of the following is incorrect explanation about Mendeleef's periodic law ?

A. Mendeleef arranged elements in horizontal rows only

B. Mendeleef arranged elements with increasing atomic weight

C. Mendeleef's system of classifying elements was more elaborate than of Lothar

D. Both (a) and (b)

**Answer:**



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6. Which basic concept was used by Mendeleef for organising the elements ?

A. They organise the metals only

B. They organise the non-metals only

C. They organise the both metals and non-metals according to increasing number of masses

D. None of the above

**Answer:**



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7. Which element was named as eka-silicon in Mendeleef classification of elements ?

A. Germanium

B. Gallium

C. Thallium

D. Selenium

**Answer:**



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8. The statement that is not correct for the periodic classification of elements is : a)The properties of elements are the periodic functions of their atomic numbers. b)non-metallic elements are lesser in number than metallic elements. c)the first ionisation energies of elements along a period do not vary in a regular manner with increase in atomic number. d)for transition elements the  $d$  – subshells are filled with electrons monotonically with increase in atomic number.

- A. the properties of the elements are the periodic function of their atomic number
- B. non-metallic elements are lesser in number than metallic elements
- C. the first ionisation energies of elements along a period do not vary in a regular manner with increase in atomic number
- D. for transition elements, the d-subshells are filled with electrons monotonically with increase in atomic numbers

**Answer:**



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**9.** The period number in the long form of the periodic table is equal to

A. magnetic quantum number of any element of the period

B. atomic number of any element of the period

C. maximum principal quantum number of  
any element of the period

D. maximum azimuthal quantum number of  
any element of the period

**Answer: C**



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**10. Which of the following is incorrect ?**

A. Henry Moseley observed regularities in the characteristics X-ray spectra of elements

B. A plot of frequency of X-ray emitted against atomic number ( $Z$ ) given a straight line

C. The atomic number of an element is equal to the number of neutron ( $s$ ) in neutral atom

D. Electronic configuration of an atom determines the physical and chemical properties

**Answer:**



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**11.** Match the Column I with Column II and select the correct answer by given codes.

Column I (Number of periods)		Column II (Number of elements)	
A.	First period	1.	14
B.	Third period	2.	02
C.	Lanthanoids	3.	14
D.	Actinoids	4.	08
		5.	04

Codes

A.  $A \ B \ C \ D$   
 2 4 1 5

B.  $A \ B \ C \ D$   
 2 4 1,3 3,1

C.  $A \ B \ C \ D$   
 2 4 1 3

D. None of these

Answer:



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**12.** Observe the following statements,

I. The physical and chemical properties of elements are the periodic functions of their electronic configuration.

II. Electronegativity of fluorine is less than the electronegativity of chlorine.

III. Electropositive nature decreases from top to bottom in a group.

The correct answer is

A. I, II and III

B. Only I



C. I and II

D. II and III

**Answer:**



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**13.** There are 10 neutrons in the nucleus of the element  ${}_Z M^{19}$ . It belongs to

A. s-block

B. d-block

C. f-block

D. None of the above

**Answer:**



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**14.** The third alkaline earth metal ion contains number of electrons and protons as

A.  $20e^{-}$  ,  $20p$

B.  $18e^{-}$  ,  $18p$

C.  $18e^{-}$ ,  $20p$

D.  $19e^{-}$ ,  $20p$

**Answer:**



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**15.** A metal having electronic configuration

$1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^{10}, 4s^2$  is in

A. s-block

B. d-block

C. p-block

D. None of these

**Answer:**



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**16.** Which of the following orbitals are in the process of filling in the 6th period ?

A. 6s, 6p, 6d, 6f

B. 6s, 5f, 6d, 6p

C. 6s, 4f, 5d, 6p

D. 5s, 5p, 5d

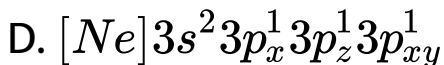
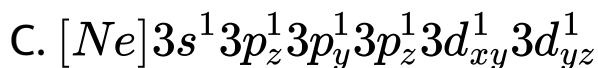
**Answer:**



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17. The configuration to second excited state of the element is (O) electronic with  $O_2$  or  $P^-$  or  $Cl^+$  is

A.  $[Ne]3s^23p_x^23p_y^13p_z^1$



**Answer:**



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**18.** The element having atomic number 33 lies in the group

A. 16

B. 14

C. 15

D. 13

**Answer:**



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**19.** General configuration of outermost and penultimate shell is

$(n - 1)s^2(n - 1)p^6(n - 1)d^x ns^2$ . If  $n = 4$  and

$x = 5$  then no. of protons in the nucleus will be

A.  $< 24$

B. 25

C. 24

D.  $> 25$

**Answer:**



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**20.** Generally, the valency of noble gases is

A. two



B. three

C. one

D. zero

**Answer:**



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**21.** The least stable ion among the following is

A.  $Li^+$

B.  $Be^-$

C.  $B^-$

D.  $C^-$

**Answer:**



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**22.** The electronic configuration of an element is  $1s^2, 2s^2, 2p^6, 3s^2 3p^3$ . The atomic number and the group number of the element X which is just below the above element in the periodic table respectively, are

A. 23 and 5

B. 23 and 15

C. 33 and 15

D. 33 and 5

**Answer:**



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**23.** What will be the IUPAC name of element having  $Z = 106$  ?

A. Unnilquadium

B. Unnilhexium

C. Unniheptium

D. Ununhexium

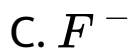
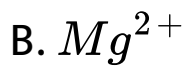
**Answer:**



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**24.** The one with the largest ionic size is

A.  $O^{2-}$

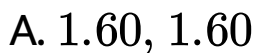


**Answer:**



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**25.** Fluorine and neon have atomic radii in angstrom given by



B. 0.72, 0.72

C. 0.72, 1.60

D. None of these

**Answer:**



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**26.** Which of the following alkali metals has smallest size ?

A. Cs

B. Rb

C. Na

D. K

**Answer:**



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27. Chloride ion and potassium ion are isoelectronic. Then

A. their sizes are same

B.  $Cl^-$  ion is bigger than  $K^+$  ion

C.  $K^+$  ion is relatively bigger

D. their sizes depend on other cation and anion

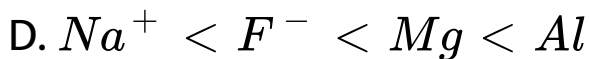
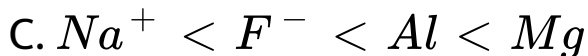
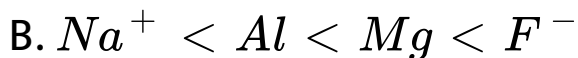
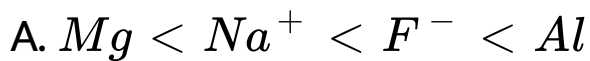
**Answer:**



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**28.** Which one of the following is correct increasing order of size ?





**Answer:**



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**29.** Ionic radii vary in

A. inverse proportion to the effective nuclear charge

B. inverse proportion to the square of effective nuclear charge

C. increase proportion to the screening effect

D. direct proportion to the square of the screening effect

**Answer:**



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30. The first ionisation energy of beryllium is more than that of boron because

A. boron has higher nuclear charge

B. boron has only one electron in p-subshell

C. atomic size of boron is less than that of beryllium

D. atomic size of boron is more than that of beryllium

**Answer:**



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**31.** Among the following, the element with highest ionisation potential is

A. boron

B. carbon

C. oxygen

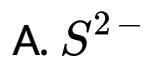
D. nitrogen

**Answer:**



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32. The isoelectronic ion having lowest ionisation energy is



**Answer:**



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**33.** The value in electron-volt per atom which represent the first ionisation energy of oxygen and nitrogen atom respectively are

A. 13.6 and 14.6

B. 14.6 and 13.6

C. 14.6 and 14.6

D. 13.6 and 13.6

**Answer:**



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34. The pair in which the ionisation energy of first species is less than that of second is

A. N, P

B.  $Be$ ,  $Be^+$

C. S, P

D.  $N$ ,  $N^-$

**Answer:**



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35. How many  $Cs$  atoms can be converted to  $Cs^+$  ions by 1 joule energy, if  $IE_1$  for  $Cs$  is  $376kJmol^{-1}$  ?

A.  $1.60 \times 10^{23}$

B.  $1.60 \times 10^{15}$

C.  $1.60 \times 10^{18}$

D.  $16.0 \times 10^{26}$

**Answer:**



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36. How many joules of energy must be absorbed to convert Li to  $Li^+$ , all the atoms present in 1.00 mg of gaseous Li?  $I E_1$  of Li is  $520.3 kJ mol^{-1}$  ( $Z = 3$ ).

A.  $0.00743 kJ$

B.  $0.520 kJ$

C.  $520 kJ$

D.  $0.0743 kJ$

**Answer:**



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37. The incorrect statements among the following is

A. the first ionisation potential of Al is less than the first ionisation potential of Mg

B. the second ionisation potential of Mg is greater than the second ionisation potential of Na

C. the first ionisation potential of Na is less than the first ionisation potential of Mg

D. the third ionisation potential of Al

**Answer:**



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**38.** Ionisation enthalpy of Na would be same as

A. value of electron affinity of  $Na^+$

B. value of electronegativity of Na

C. value of ionisation potential of Mg

D. value of electron affinity of Na

**Answer:**



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**39.** Which one of the following statements is incorrect in relation to ionisation enthalpy?

A. Ionisation enthalpy increases for each successive electrons

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

electron from core noble gas

configuration

C. End of valence electrons is marked by a

big jump in ionisation enthalpy

D. Removal of electron from orbitals bearing

lower  $n$  value is easier than from orbitals

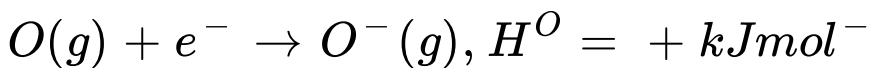
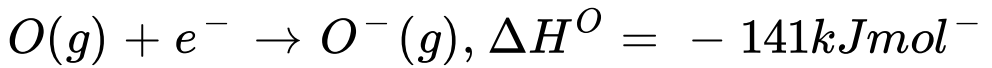
having higher  $n$  value

**Answer:**



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



Thus the process of formation of  $O^{2-}$  in gas phase is non-spontaneous. It is due to the fact that

A. oxygen is more electronegative

B. addition of electron in oxygen results in

larger size of the ion

C. electron repulsion outweighs the stability gained by achieving noble gas configuration

D.  $O^-$  ion has comparatively smaller size than oxygen atom

**Answer:**



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**41.** Which one of the following arrangements represents the correct order of electron gain

enthalpy of the given atomic species?

A.  $Cl < F < S < O$

B.  $O < S < F < Cl$

C.  $S < O < Cl < F$

D.  $F < Cl < O < S$

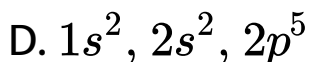
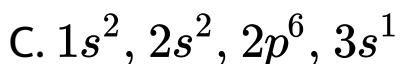
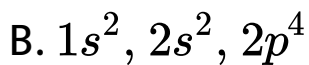
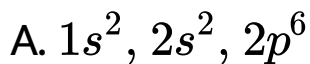
**Answer:**



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42. Electronic configurations of four elements A, B, C and D are given below

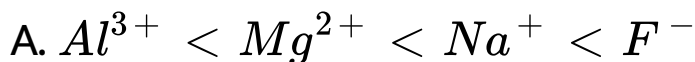


**Answer:**

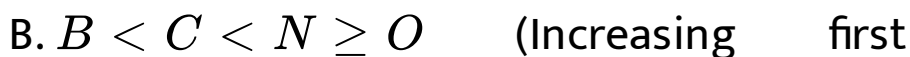


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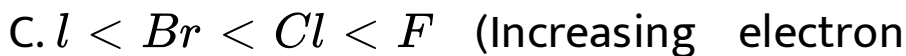
43. In which of the following options the order arrangement does not agree with the variation of property indicated against it?



(Increasing ionic size)



ionisation enthalpy)



gain enthalpy)

D.  $Li < Na < K < Rb$  (Increasing metallic radius)

**Answer:**



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44. The electron affinity values (in  $kJmol^{-1}$ ) of three halogens,  $x$ ,  $y$ , and  $z$  are, respectively,  $-349$ ,  $-333$ , and  $-325$ . Then  $x$ ,  $y$ , and  $z$ , are respectively,

A.  $F_2$ ,  $Cl_2$  and  $Br_2$

B.  $Cl_2$ ,  $F_2$  and  $Br_2$

C.  $Cl_2$ ,  $Br_2$  and  $F_2$

D.  $Br_2$ ,  $Cl_2$  and  $F_2$

**Answer:**



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**45.** Which one of the following statements is false ?

A. The electron affinity of chlorine is less than that of fluorine

B. The electronegativity of fluorine is more than that of chlorine

C. The electron affinity of bromine is less than that of chlorine

D. The electronegativity of chlorine is more than that of bromine

**Answer:**



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**46.** Which of the following element has highest electronegativity ?

A. Oxygen

B. Chlorine

C. Fluorine

D. Nitrogen

**Answer:**



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47. In  $C$ ,  $N$ ,  $O$  and  $F$  the electronegativity

A. Increases from carbon to fluorine

B. decreases from carbon to oxygen and then increases

C. decreases from carbon to fluorine

D. increases from carbon to oxygen and then decreases

**Answer:**



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48. Electronegativity of  $F$  on Pauling scale is 4.0

Calculate its value on Mulliken scale .

A. 10.0

B. 11.2

C. 8.54

D. 16

**Answer:**



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**49.** Two elements whose electronegativities are 1.2 and 3.0 the bond formed between them would be

- A. ionic
- B. covalent
- C. coordinate
- D. metallic

**Answer:**



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50. Calculate electronegativity of carbon at

Pauling scale Given that :

$$E_{H-H} = 104.2 \text{ kcal mol}^{-1} \quad E_{C-C} = 83.1 \text{ kcal mol}^{-1}$$

,

$$E_{C-H} = 98.8 \text{ kcal mol}^{-1}.$$

Electronegativity of hydrogen = 2.1.

A. 0.498

B. 0.598

C. 2.134

D. 2.597

**Answer:**



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**51. Which one of the following is incorrect ?**

A. Non-metals have strong tendency to gain

electron

B. Electronegativity is directly related to

non- metallic properties of elements

C. Electronegativity is inversely proportional to the metallic properties of elements

D. Increase in electronegativity done the group is accompanide by a decrease in non-metallic properties

**Answer:**



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52. Pauling's equation for determining the electronegativity of an element, is ( $X_A, X_B$  are

electronegativity value of elements A and B respectively,  $\Delta$  represents the polarity of A-B bond.)

A.  $X_A - X_B = 0.208\sqrt{\Delta}$

B.  $X_A + X_B = 0.208\sqrt{\Delta}$

C.  $X_A - X_B = 0.0208\Delta^2$

D.  $X_A - X_B = \sqrt{\Delta}$

**Answer:**



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

Column I (Elements)		Column II (Properties)	
A.	$\text{Li}^+ < \text{Al}^{3+} < \text{Mg}^{2+} < \text{K}^+$	1.	$\Delta\text{EA}$ (Electron affinity)
B.	$\text{Li}^+ > \text{Al}^{3+} > \text{Mg}^{2+} > \text{K}^+$	2.	Ionic radii
C.	$\text{Cl} > \text{F} > \text{Br} > \text{I}$	3.	EN (Electronegativity)
D.	$\text{F} > \text{Cl} > \text{Br} > \text{I}$	4.	ENC

Codes

A.  $A \quad B \quad C \quad D$   
 $2 \quad 4 \quad 3 \quad 1$

B.  $A \quad B \quad C \quad D$   
 $2 \quad 4 \quad 1 \quad 3$

C.  $A \quad B \quad C \quad D$   
 $4 \quad 2 \quad 3 \quad 1$

D.  $A \quad B \quad C \quad D$   
 $4 \quad 2 \quad 1 \quad 3$

Answer:



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54. Which set contains pair of elements that do not belong to same group but show chemical resemblences ?

A. B, Al

B. Be, Al

C. Hf, Zr

D. K, Pb

**Answer:**

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55. Which pair of elements has same chemical properties ?

A. 13, 22

B. 3, 11

C. 4, 24

D. 2, 4

**Answer:**

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56. The element of second period which forms most acidic oxide is

A. carbon

B. boron

C. Fluorine

D. nitrogen

**Answer:**



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57. In periodic table, melting point/boiling point increases down the group in which of the following group ?

A. Group 13

B. Group 2

C. Group 17

D. Group 1

**Answer:**



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58. 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:**



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59. Considering the elements  $B$ ,  $Al$ ,  $Mg$  and  $K$ , the correct order of their metallic character is

A.  $B > Al > Mg > K$

B.  $Al > Mg > B > K$

C.  $Mg > Al > K > B$

D.  $K > Mg > Al > B$

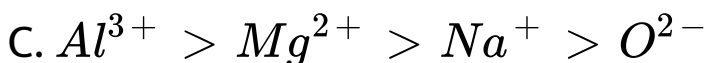
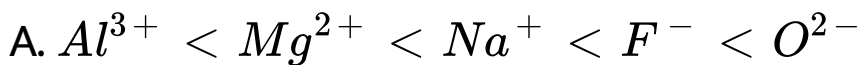
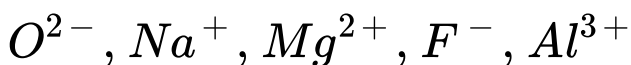
**Answer:**



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1. Elements/ions having same number of electrons are known as isoelectronic species.

Arrange the following elements in correct order of atomic/ionic radii and choose the correct from the four choices given below



D. None of the above

**Answer:**



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2. For the properties mentioned, the correct trend for the different species is in

A. Strength as Lewis acid -

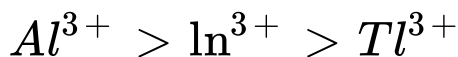


B. Inert pair effect -  $Al > Ga > In$

C. Oxidising

property

-



D. First ionisation enthalpy -  $B > Al > Tl$

**Answer:**



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3. Which of the following choices represent the correct order of first ionisation enthalpy ?



B.  $B > C > N > O > F$

C.  $B < C < N > O < F$

D.  $B < C < N > O > F$

**Answer:**



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4. The lower electron affinity of fluorine than that of chlorine is due to

A. Smaller size



B. smaller unclear charge

C. difference in their electronic configurations

D. its highest reactivity

**Answer:**



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5. The atomic numbers of elements A,B,C and D are  $Z - 1$ ,  $Z$ ,  $Z + 1$  and  $Z + 2$  respectively. If B is a noble gas, choose the correct statement among

the following statements :

I. A has higher electron affinity.

II. C exists in +2 oxidation state.

III. D is an alkaline earth metal.

A. I and II

B. II and III

C. I and III

D. I, II and III

**Answer:**



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