



CHEMISTRY

BOOKS - A2Z CHEMISTRY (HINGLISH)

CLASSIFICATION OF ELEMENTS AND PERIODICITY OF PROPERTIES

Periodic Table And Classification Of Element

1. Which of the following statement is wrong for the d-block elements?

- A. General electronic configuration for them is $(n - 1)d^{1-10}ns^{0-2}$
- B. They generally exhibit variable valency .
- C. Last electron enters in $(n - 1)d$ subshell in them.
- D. They are placed from third period to sixth period in modern periodic table.

Answer: D



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2. The atomic number of an element variable valency.

A. Number of electrons

B. Number of protons

C. Number of neutrons

D. Number of isotopes

Answer: B



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3. The lanthanide contraction refers to:

- A. radius of the series.
- B. valence electrons of the series.
- C. the density of the series.
- D. electronegativity of the series.

Answer: A



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4. Which of the following is the atomic number of a metal?

A. 32

B. 34

C. 36

D. 38

Answer: D



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5. The group in the modern periodic table, in which all the elements do not have same number of electrons in their valence shell is :

A. *13th*

B. *11th*

C. *9th*

D. zero

Answer: D



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6. The element with atomic number 9, 17, 35, 53, 85 are all

A. noble gases

B. halogens

C. heavy metals

D. light metals

Answer: B



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

A. *f* – block

B. *s* – block

C. *d* – block

D. None of these

Answer: D



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8. Mercury is the only metal which is liquid at $0^{\circ}C$. This is due to

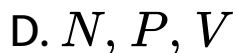
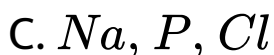
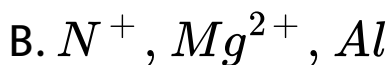
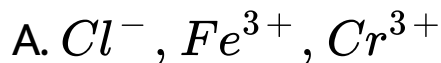
- A. Very high ionisation energy and weak metallic bond
- B. Low ionisation energy
- C. High atomic weight
- D. High vapour pressure

Answer: A



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9. Which set has the same number of unpaired electrons in their ground state?



Answer: D



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10. The electronic configuration of an element X is $1s^2, 2s^2, 2p^6, 3s^2, 3p^3$. What is the atomic number of the element which is just below the element X in the periodic table?

A. 34

B. 49

C. 33

D. 31

Answer: C



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11. An element has electronic configuration $1s^2, 2p^6, 3s^2, 3p^3$. Predict their group and block.

A. period= 3^{rd} , block= p , group= 15

B. period= 5^{th} , block= s , group= 1

C. period= 3^{rd} , block= p , group= 12

D. period= 4^{th} , block= d , group= 12

Answer: A



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12. which of the following set of elements cannot be a triad?

A. *Li, Na, k*

B. B,Al,Ga

C. Be,Mg,Ca

D. Cl,Br,I

Answer: B



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13. Group comprising all metals is

A. IIIA

B. IVA

C. VIIA

D. IIA

Answer: D



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14. In Mendeleev's periodic table some pair of elements do not follow increasing order of atomic weight known as anomalous pair. The correct example of anomalous pair is

A. *Cl, Ar*

B. *Th, Pa*

C. *Te, In*

D. *Co, Nb*

Answer: B



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15. The element with atomic number 36 belongs to Block in the periodic table

A. P

B. S

C. F

D. D

Answer: A



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16. Electronic configuration of M^{3+} is $[Ar]3d^{10}4s^2$, it belongs to

A. s-block

B. p-block

C. d-block

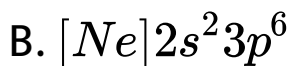
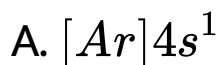
D. f-block

Answer: B



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17. Under normal condition which of the following electronic configuration is able to form dipositive ion



D. none of these

Answer: C



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18. Elements of atomic number 6 is placed in

A. IV group

B. IV period

C. VI group

D. IIIgroup

Answer: A



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19. An element with atomic number 20 will be placed in which period of the periodic table

A. 4

B. 3

C. 2

D. 1

Answer: A



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20. In the periodic table, the element with atomic number 16 will be placed in the group

A. Sixth

B. fourth

C. Fifth

D. third

Answer: A



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21. An element M has an atomic mass 19 and atomic number 9. Its ion is represented by



Answer: B



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22. According to periodic law of elements, the variation in properties of elements is related to their:

- A. Atomic number
- B. Atomic mass
- C. Nuclear mass
- D. Neutron-proton ratio

Answer: A



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23. The d-block elements consists mostly of

A. Monovalent metals

B. All non-metals

C. many mentals with catalytic properties

D. Elements which generally from
stoichiometric mental oxide

Answer: C



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24. $1s^2 2s^2 2p^6 3s^2$ is the electronic configuration of the metal

A. *Na*

B. *Mg*

C. *Fe*

D. *Al*

Answer: B



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25. Which one of the following belongs to representative group of elements in the periodic table?

A. Aluminium

B. Argon

C. chromium

D. Lanthanum

Answer: A



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26. If the atomic number of an element is 33, it will be placed in the periodic table in the

A. first group

B. fifth group

C. third group

D. seventh group

Answer: B



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27. the elements on the right side of the periodic table are

A. Metals

B. metalloids

C. non-metals

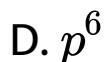
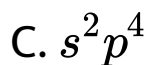
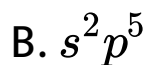
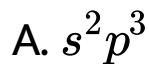
D. transition elements

Answer: C



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28. Electronic configuration of chalcogens in their outermost orbit is



Answer: C



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29. Dobereiner's triads is

A. *Na, K, Rb*

B. *Mg, S, As*

C. *P, S, As*

D. *Cl, Br, I*

Answer: D



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30. In the modern periodic table, elements are arranged in

- A. increasing mass
- B. increasing volume
- C. increasing atomic number
- D. Alphabetically

Answer: C



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31. In the periodic table, going down in fluorine group

- A. Ionic radius will increase
- B. Electronegativity will increase
- C. Reactivity will increase
- D. Ionisation potential will increase

Answer: A



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32. Who developed the long form of periodic table?

A. Lothar meyer

B. Niel Bohr

C. Mendeleev

D. Moseley

Answer: B



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33. The element or elements whose position is anomalous in the periodic table is

A. Hydrogen

B. *Fe*, *Co* and *N*

C. Inert gases

D. Halogens

Answer: A



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34. The most predominantly ionic compounds will be obtained from the combination of elements belonging to

- A. 1 and 7 groups
- B. 2 and 6 groups
- C. 3 and 5 groups
- D. 0 and 7 groups

Answer: A



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35. the tenth elements in the periodic table resembles with are

- A. First period
- B. second period
- C. fourth group
- D. Ninth group

Answer: B



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36. Chloride of an element A gives neutral solution in water. In the periodic table, the elements A belong to

- A. First group
- B. Third group
- C. Fifth groups
- D. First transition series

Answer: A



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37. Lanthanoid contraction is caused due to:

A. The imperfect shielding on outer electrons by 4f -electrons from the nuclear charge

B. The appreciable shielding on outer electrons by 4f-electrons from the nuclear charge

C. The appreciable shielding on outer electrons by 5d-electrons from the nuclear charge

D. The same effective nuclear charge from

Ce to Lu

Answer: A



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38. Hydrogen by donating one electron forms

H^+ . In this property, it resembles with

A. Transitional metals

B. Alkaline earth metals

C. Alkali metals

D. Halogens

Answer: C



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39. The element having the electronic configuration $1s^2, 2s^2 2p^6, 3s^2 3p^1$ is

A. A transition elements

B. A representative element

C. an inert gas

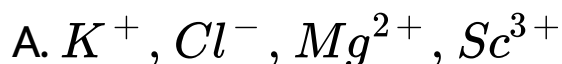
D. An inner transition elements

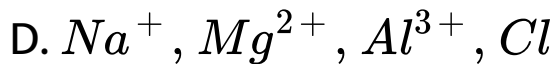
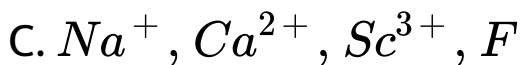
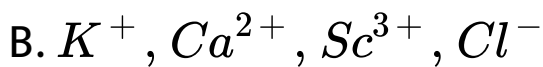
Answer: B



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



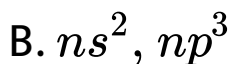
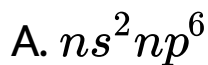


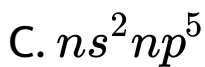
Answer: C



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41. The electronic configuration of halogen is





Answer: A



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42. In the ground state of cobalt atom ($Z = 27$), there are Unpaired electrons and thus the atom is

A. 3,paramagenetic

B. 2, paramagnetic

C. 3 diamagnetic

D. 2 diamagnetic

Answer: B



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43. Which of the following statement is not correct regarding hydrogen atom?

A. It resembles halogens in some properties

B. it resembles alkali metals in some properties

C. it can be placed in 7th group of periodic table

D. it cannot be placed in first group of periodic table

Answer: A



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44. Elements A and B with their respective electronic configurations $3d^{10}4s^1$ and $4d^{10}5s^1$ in their outermost shell are

A. Both coinage metals

B. Both non-metals

C. A is non-metal and B is coinage metal

D. A is a coinage metal and B is non-metal

Answer: A



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Atomic Radius Screening Effect And Penetration Effect

1. The ionic radii of N^{3-} , O^{2-} and F^{-} are respectively given by:

A. 1.36, 1.40, 1.70

B. 1.36, 1.71, 1.40

C. 1.71, 1.40, 1.36

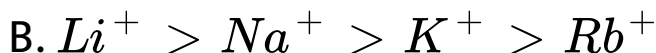
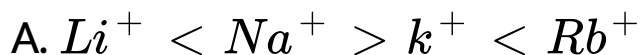
D. 1.71, 1.36, 1.40

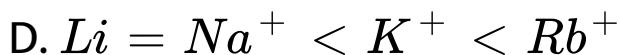
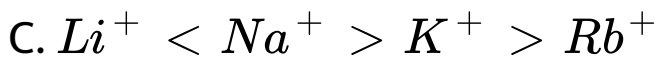
Answer: B



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2. The ionic conductance of the following cations in a given concentration is in the order



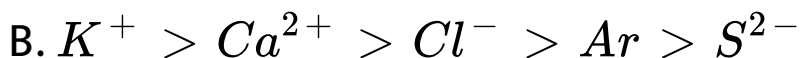
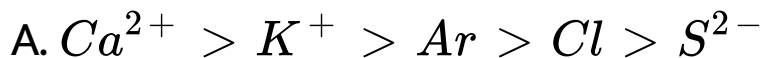


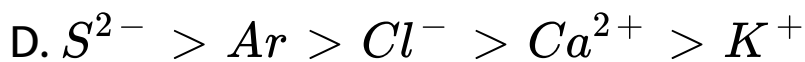
Answer: A



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3. The correct order of the size is



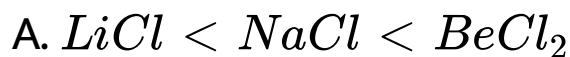


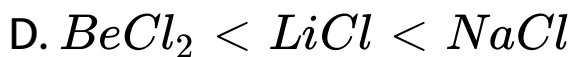
Answer: A



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4. The correct order of increasing covalent character is :





Answer: C



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5. Which of the following elements have maximum atomic volume?

A. *K*

B. *Ca*

C. *Fe*

D. *Br*

Answer: A



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6. Ionic radii are

A. Directly proportional to effective nuclear charge

B. Directly proportional to square of effective nuclear charge

C. Inversely proportional to effective nuclear charge

D. Inversely proportional to square of effective nuclear charge.

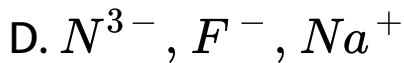
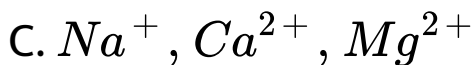
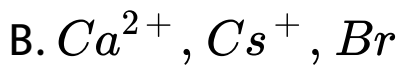
Answer: C



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7. Which set represents isoelectronic species?

A. Be , Al^{3+} , Cl^{-1}



Answer: D



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8. Which of the following alkali metal ions has the lowest ionic mobility in aqueous solutions?

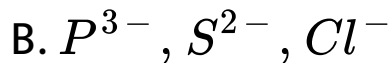
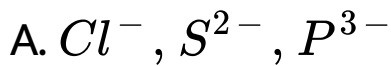


Answer: C



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9. In the ions P^{3-} , S^{2-} and Cl , the increasing order of size is:

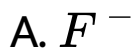


Answer: A



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10. Which one of the following is expected to have largest size?

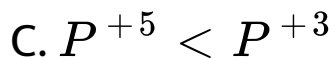
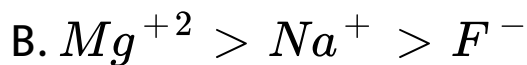
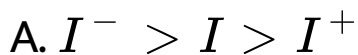


Answer: D



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11. Which of the following order of atomic / ionic radius is not correct?

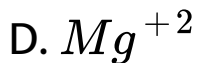


Answer: B



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12. Which of the following has the largest ionic radius?

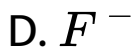
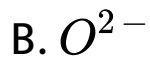


Answer: C



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13. Which one of the following is the smallest in size?



Answer: A



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14. Chloride ion and potassium ion are isoelectronic. Then

- A. Potassium ion is relatively bigger
- B. Depends on the other cation and anion
- C. Their size are same
- D. Chloride ion is bigger than potassium ion

Answer: D



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15. Which of the following atoms should have the largest size?

A. *Cs*

B. *Fr*

C. *Kr*

D. *Xe*

Answer: B



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16. When a neutral atom is converted into cation, there is

A. Decrease in the atomic number

B. An increase in the atomic number

C. A decrease in size

D. An increase in size

Answer: C



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17. Which of the alkali metals is the smallest in size?

A. *Rb*

B. *K*

C. *Na*

D. *Li*

Answer: D



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18. In which of the following pairs, the difference between the covalent radii of the two metals is maximum.

A. K, Ca

B. Mn, Fe

C. Co, Ni

D. Cr, Mn

Answer: A



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19. A reduction in atomic size the increases in atomic number is a charactersitic of elements of:

- A. f-block
- B. Radioactive series
- C. High atomic mass
- D. d-block

Answer: A



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20. The atomic radius of elements of which of the following series would be nearly the same

A. $NaKRbCs$

B. $LiBeBC$

C. $FeCoNiCu$

D. $FClBrI$

Answer: C



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21. Which of the following statement is correct?

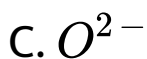
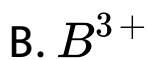
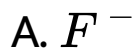
- A. X^- ion is larger in size than X atom
- B. X^+ ion is larger in size than X atom
- C. X^+ ion is larger in size than X^- ion
- D. X^+ and X^- ion are equal in size

Answer: A



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22. Which of the following has the highest ionic radius?



Answer: C



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23. Which is helpful in the formation of ionic bond

A. Only small cation

B. Only small anion

C. Small cation and small anion both

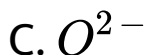
D. Low positive charge, large cation and small anion

Answer: D



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24. which of the following ions has the smallest radius?

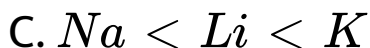


Answer: A



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25. The correct order of radii is



Answer: B



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26. Which is the correct order of atomic radii?

A. $Mg < Al < Na < K$

B. $Al < Mg < Na < K$

C. $K < Na < Mg < Al$

D. None of these

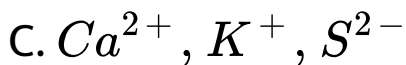
Answer: B



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27. Which of ions are isoelectronic?

A. Be^{2+} , Mg^{2+} , Al^{3+}

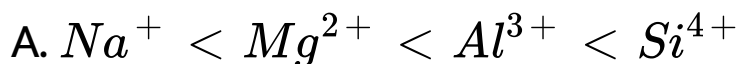


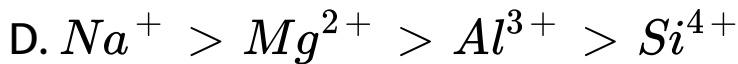
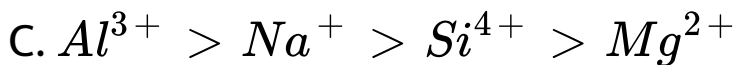
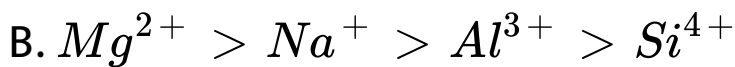
Answer: C



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28. The order of magnitude of ionic radii of ions Na^+ , Mg^{2+} , Al^{3+} and Si^{4+} is



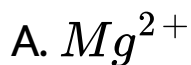


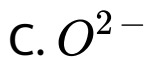
Answer: D



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29. which of the following has largest radius ?





Answer: C



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30. Which of the following does not represents the correct order of the property indicated ?

A. $Sc^{3+} > Cr^{3+} > Fe^{3+} > Mn^{3+}$ ionic radii

B. $Sc < Ti < Cr < Mn$ Density

C. $Mn^{2+} > Ni^{2+} < Co^{2+} < Fe^{2+}$ ionic radii

D. $FeO < CaO < MnO < CuO$ Basic nature

Answer: A



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31. Which of the following statement concerning lanthanides elements is false.

A. Lanthanides are separated from one another by ion

B. Ionic radii of trivalent lanthanides steadily increase with increase in the atomic number

C. All lanthanides are highly dense metals

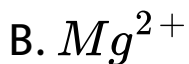
D. More characteristic oxidation state of lanthanide elements is +3

Answer: B



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32. Which of the following ions has the smallest size?



Answer: D



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33. The correct order of increasing radii of the elements Si , Al , Na and P is

A. Si , Al , P , Na

B. P , Si , Al , Na

C. Al , Si , P , Na

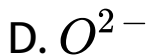
D. Al , P , Si , Na

Answer: B



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34. which one of the following species possesses maximum size?

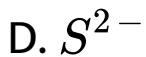
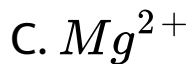


Answer: D



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35. which of the following ions is the smallest in size?

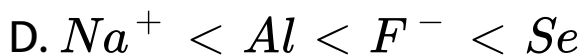
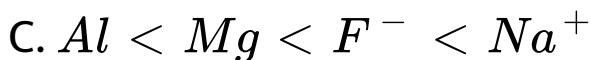
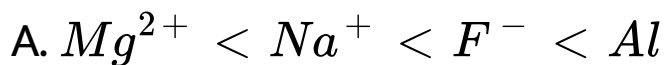


Answer: C



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36. The size of the following species increases
in the order

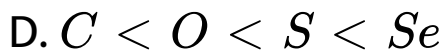
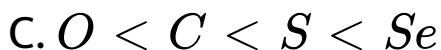
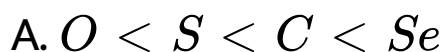


Answer: A



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37. Which of the following is correct order of atomic radii?



Answer: C



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38. The ratio between radii of He^+ ion and H atom is

A. 1

B. $\frac{1}{2}$

C. $\frac{3}{2}$

D. 2

Answer: A



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39. Which of the following is the largest ion?

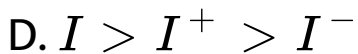
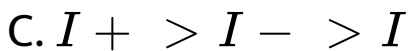
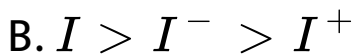
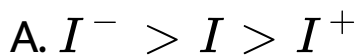


Answer: C



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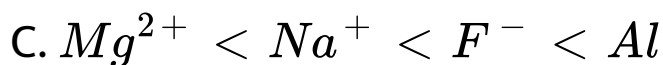
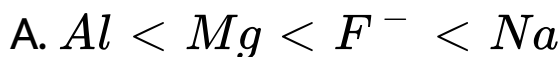
40. Which one is the correct order of the size of the iodine species?



Answer: A



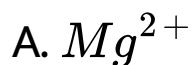
41. The size of the following species increases in the order



Answer: C



42. Which of the following has the smallest size?



Answer: D



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43. The trivalent ion having size in lanthanide series is

A. Ti

B. Zr

C. Hf

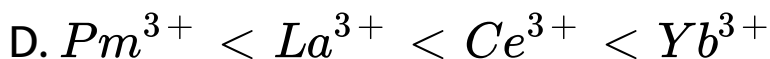
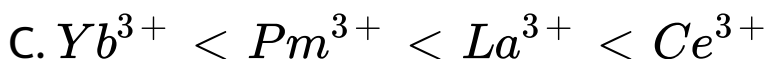
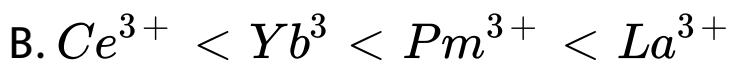
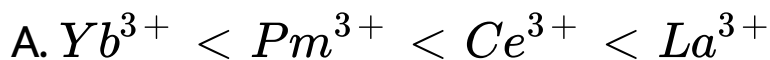
D. La

Answer: D



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44. The correct order of atomic radii is:



Answer: A



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45. Correct energy value order is

A. $nsnpnd(n - 1)f$

B. $nsnp(n - 1)d(n - 2)f$

C. $nsnp(n - 1)d(n - 1)f$

D. $ns(n - 1)dn(n - 1)f$

Answer: B



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46. The correct order of atomic radii is

A. $Ce > Sm > Yb > Lu$

B. $Sm > Ce > Lu > Yb$

C. $Lu > Yb > Sm > Ce$

D. $Sm > Yb > Ce > Lu$

Answer: A



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47. The smallest among the following ions is

A. Na^+

B. Mg^{+2}



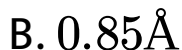
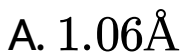
Answer: D



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48. The radius of La^{+} (at no 57) is 1.06\AA .

What may be the radius of Lu^{3+} (at no.71)?



C. 1.60\AA

D. 1.40\AA

Answer: B



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49. Which of the following gaseous atoms has the highest value of ionisation enthalpy?

A. *P*

B. *Si*

C. Mg

D. Al

Answer: A



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50. The correct order of ionisation energy for comparing carbon, nitrogen and oxygen atoms is

A. $C > N > O$

B. $C > N < O$

C. $C < N > O$

D. $C < N < O$

Answer: C



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51. The second ionisation enthalpies of elements are always higher than their first ionisation enthalpies because:

- A. cation formed always have stable half-filled or completely filled valence shell electron configuration.
- B. It is easier to remove electron process.
- C. ionisation is an endothermic process.
- D. the cation is smaller than its parent atom.

Answer: D



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52. The first ionisation potential is maximum for

A. *B*

B. *N*

C. *O*

D. *Be*

Answer: B



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Ionisation Energy

1. For C , N , O and F , which of the following orders is correct for IP ?

A. $F > O > C > N$

B. $O > F > N > C$

C. $F > N > O > C$

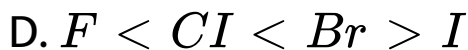
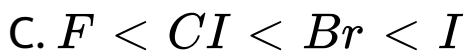
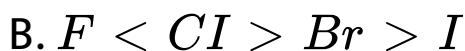
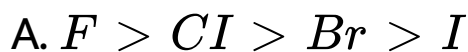
D. $N > F > O > C$

Answer: C



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2. The correct order of reactivity of halogens is



Answer: A



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3. The first ionisation potential in electron volts of nitrogen and oxygen atoms are respectively given by

A. 14.6, 13.6

B. 13.6, 14.6

C. 13.6, 13.6

D. 14.6, 14.6

Answer: A



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4. The atomic number of vanadium (V), chromium (Cr), manganese (Mn) and iron (Fe) are respectively 23, 24, 25, 26. Which out of these may be expected to have the jump in second ionisation enthalpy?

A. Mn

B. Fe

C. V

D. Cr

Answer: D



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5. Which of the following has the highest first ionisation energy?

A. *Li*

B. *Be*

C. *B*

D. *C*

Answer: D



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6. The first ionisation potential of Na , Mg , Al and Si are in the order

A. $Na < Mg > Al < Si$

B. $Na > Mg > Al > Si$

C. $Na < Mg < Al > Si$

D. $Na > Mg > Al < Si$

Answer: A



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7. Which among the following elements have the lowest value of IE_1 ?

A. *Pb*

B. *Sn*

C. *Si*

D. *C*

Answer: B



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8. Which of the following elements will have the lowest first ionisation energy?

A. *Mg*

B. *Rb*

C. *Li*

D. *Ca*

Answer: B



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9. Fluorine is the best oxidising agent because it has

A. Highest electron affinity

B. Highest E_{red}^0

C. Highest E_{oxid}^0

D. Lowest electron affinity

Answer: B



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10. The ionisation energy of nitrogen is more than that of oxygen because

A. Of the extra stability size of nitrogen is more than that of oxygen because

B. Of the smaller size of nitrogen

C. The former contains less number of electrons

D. The former about ionisation potential

Answer: A



11. Which of correct about ionisation potential?

A. It is independent of atomic radii

B. It increases with increase in atomic radii

C. it remains constant with increase in
atomic radii

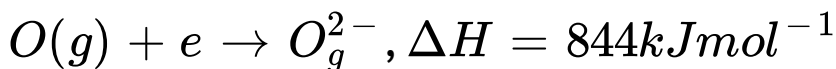
D. It decrease with increase in atomic radii

Answer: D



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12. The formation of the oxide ion O_g^{2-} requires first an exothermic and then an endothermic step as shown below:



This is because:

- A. O^- ions has comparatively larger size than oxygen atom
- B. Oxygen has high electrons affinity

C. O^- ion will tend to resist the addition of another electron

D. Oxygen is more electronegative

Answer: C



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13. *Mg* and *Li* are similar in their properties due to

A. Same e/m ratio

B. same electron affinity

C. Same group

D. Same ionic potential

Answer: D



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14. Maximum I.E. Is for

A. Be^+

B. Li^+

C. B^+

D. Ne^+

Answer: B



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15. Order of first ionisation potentials of elements Li , Be , B , Na is

A. $Li > Be > B > Na$

B. $Be > B > Li > Na$

C. $Na > Li > B > Be$

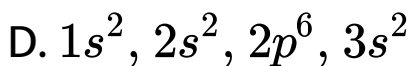
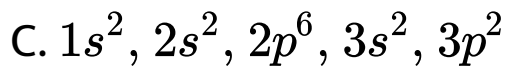
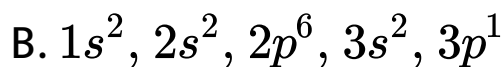
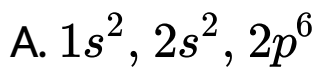
D. $Be > Li > B > Na$

Answer: B



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16. A sudden jump- between the values of second and third ionisation energies of an atom would be associated with the electronic configuration.



Answer: D



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17. A neutral atom will have the lowest ionisation potential when its electronic configuration is

A. $1s^1$

B. $1s^2, 2s^2p^6$

C. $1s^2, 2s^2p^2$

D. $1s^2, 2s^2p^6, 3s^1$

Answer: D



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18. Which of the following is incorrect?

A. IE_1 of $Li < IE_1$ of Be

B. IE_1 of $Be < IE_1$ of B

C. IE_1 of $Li < IE_1$ of Na

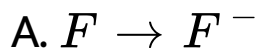
D. IE_1 of $He < IE_1$ of Ne

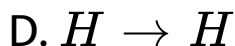
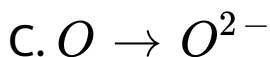
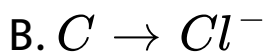
Answer: B



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19. The process requiring the absorption of energy is





Answer: C



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20. Which of the following sequence regarding the first ionisation potential of coinage metal is correct?

A. $Cu > Ag > Au$

B. $Cu < Ag < Au$

C. $Cu > Ag < Au$

D. $Ag > Cu < Au$

Answer: C



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21. The element with highest value of ionisation potential is

A. Potassium

B. Helium

C. Hydrogen

D. Xenon

Answer: B



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22. In halogens, with increase of atomic number where habit is found

A. Ionisation potential decrease

B. Ionic radii potential decreases

C. Habit to loose electron decreases

D. In MX_2 (M = metal X = halogen),

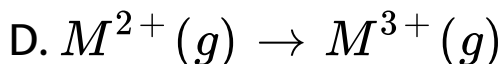
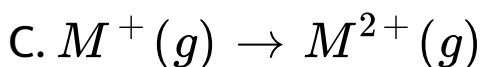
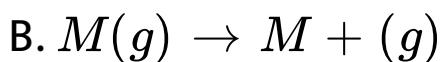
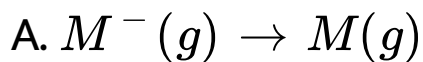
covalent properties decrease.

Answer: A



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23. Which of the following transitions involves maximum amount of energy?



Answer: D



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24. $A \rightarrow A^+ + e, E_1$ and

$A^+ \rightarrow A^{2+} + e, E_2$. The energy required to

pull out the two electrons are E_1 and E_2

respectively. The correct relationship between

two energy would be

A. $E_1 > E_2$

B. $E_1 = E_2$

C. $E_1 < E_2$

D. $E_1 \neq E_2$

Answer: C





25. Which of the following relation is correct with respect first (I) and second (II) ionisation of sodium and magnesium?

A. $I_{Mg} = II_{Na}$

B. $I_{Na} > I_{Mg}$

C. $II_{Mg} > II_{Na}$

D. $II_{Na} > II_{Mg}$

Answer: A



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26. How many ionisation energies can carbon have?

A. 1

B. 2

C. 6

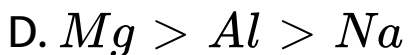
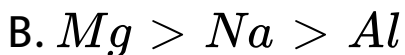
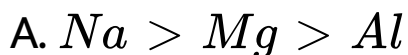
D. 4

Answer: D



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27. The correct sequence of elements in decreasing order first ionisation energy is



Answer: D



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28. The first ionisation potentials (eV) of Be and B respectively are

A. $9.32eV$, $8.29eV$

B. $9.32eV$, $9.32eV$

C. $8.29eV$, $8.29eV$

D. $8.29eV$, $9.32eV$

Answer: A



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29. the highest ionisation energy stands for

A. *He*

B. *C*

C. *N*

D. *Cl*

Answer: A



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30. which of the following has the least ionisation potential?

A. *Li*

B. *Cl*

C. *Cs*

D. *H*

Answer: C



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31. The first ionisation potential will be maximum for

A. Lithium

B. Hydrogen

C. Uranium

D. Iron

Answer: B



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32. The second ionisation potential is

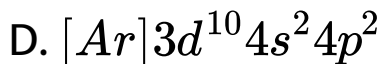
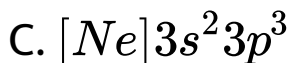
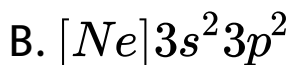
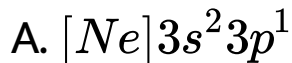
- A. Less than the first ionisation potential
- B. Equal to the first ionisation potential
- C. Greater than the first ionisation potential
- D. None of these

Answer: C



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33. Which one of the following elements has the highest ionisation energy?



Answer: C



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34. What will be the order of first ionisation energy?

A. $Na > Li > K$

B. $K > Li > Na$

C. $Li > Na > K$

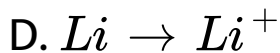
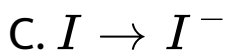
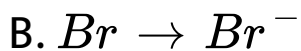
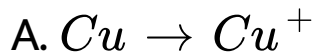
D. $Li > K > Na$

Answer: C



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35. In which of the following process highest energy is absorbed?



Answer: A



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36. The increasing order of the first ionisation enthalpies of the elements B , P , S and F (lowest first) is:

A. $F < S < P < B$

B. $P < S < B < F$

C. $B < P < S < F$

D. $B < S < P < F$

Answer: D



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37. Which of the following explanation is best for not placing hydrogen in either the group of alkali metals or halogens?

A. The ionisation energy of hydrogen is too high for group of alkali metals, but too low of halogen group

B. Hydrogen can form compounds with all other elements.

C. Hydrogen is much lighter element than the alkali metals or the halogens

D. None of the above

Answer: A



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38. Which of the following represents the correct order of increasing first ionisation enthalpy for *Ca*, *Ba*, *Se*, *S* and *Ar*?

A. $Ca < S < Ba < Se < Ar$

B. $S < Se < Ca < Ba < Ar$

C. $Ba < Ca < Se < S < Ar$

D. $Ca < Ba < S < Se < Ar$

Answer: C



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39. The first ionisation potential of Na is $5.1eV$. The value of electrons gain enthalpy of Na^+ will be

A. $-2.55eV$

B. $-5.1eV$

C. $-10.2eV$

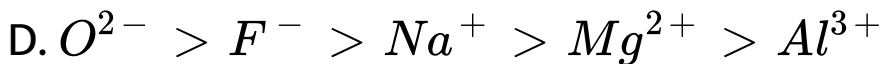
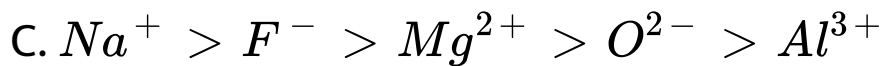
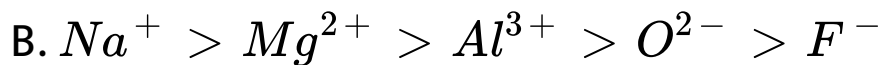
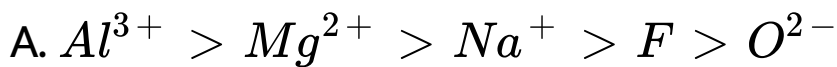
D. $+2.55eV$

Answer: B



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40. The correct sequence which shows decreasing order of the ionic radii of the element is

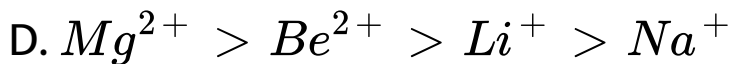
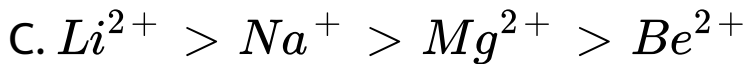
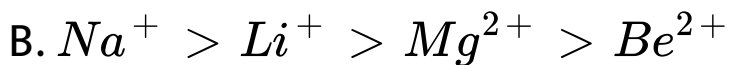
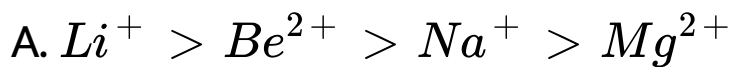


Answer: D



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41. The set representing the correct order of ionic radius is



Answer: B



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Electron Gain Enthalpy

1. Ionic compounds are formed most easily with

A. Low electron affinity, high ionisation energy

B. High electron affinity, low ionisation energy

C. Low electron affinity, low ionisation energy

D. High electron affinity, High ionisation energy

Answer: B



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2. For magnitude of electron gain enthalpy of chalcogens and halogens, which of the following option is correct?

A. $Br > F$

B. $S > F$

C. $O < Cl$

D. $S < Se$

Answer: C



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3. Electron affinity depends on

A. Atomic size

B. Nuclear charge

C. Atomic number

D. Atomic size and nuclear charge both

Answer: D



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4. In comparison with alkali metals, the electron affinity of halogens is

A. very high

B. very low

C. nearly same

D. exactly same

Answer: A



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5. The correct electron affinity order of

N, O, S, Cl is:

A. $O < N < Cl < S$

B. $Cl > O > S > N$

C. $N < O < S < Cl$

D. $N = Cl > O = S$

Answer: C



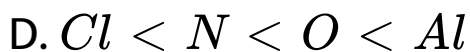
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6. Increasing order of electron affinity is

A. $N < O < Cl < Al$

B. $O < N < Al < Cl$

C. $Al < N < O < Cl$



Answer: C



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7. The correct order of electron affinity is



Answer: C



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8. The electron affinity of

A. Carbon is greater than oxygen

B. Sulphur is less than oxygen

C. Iodine is greater than bromine

D. Boron is less than chlorine

Answer: D



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9. the correct order of electron affinity is

A. $O > C > N > B$

B. $B > N > C > O$

C. $O > C > B > N$

D. $O > B > C > N$

Answer: C



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10. In which of the following species energy is released when electron is added?



Answer: B



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11. The amount of energy which is released due to addition of extra electron to the outermost orbit of gaseous atom is called

- A. Electron capacity
- B. Electron affinity
- C. Ionisation potential
- D. Electronegativity

Answer: B



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12. Which one has maximum electron affinity?

A. N

B. Be

C. B

D. Cl

Answer: D



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13. Which is the correct order of electron affinity?

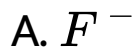


Answer: D



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14. Which of the following species has the highest electron affinity?



Answer: A



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15. The electron affinity for the inert gases is

A. Zero

B. High

C. Negative

D. Positive

Answer: A



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16. Which of the following element has the highest value of electron affinity?

A. Carbon

B. Oxygen

C. Fluorine

D. Neon

Answer: C



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17. The electron affinities of halogens are $F = 322$, $Cl = 349$, $Br = 324$, $I = 295 \text{ kJ mol}^{-1}$. The higher value for Cl as compared to that of F is due to

- A. Weaker electron-electron repulsion in Cl
- B. Higher atomic radius of F
- C. Smaller electronegativity of F
- D. More vacant P -subshell in Cl

Answer: A



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18. Nitrogen has lower electron affinity than its preceding element carbon because

A. Electron affinity decreases along a period

B. Electron affinity generally increases along a period

C. Nitrogen atom has half-filled p-orbital

D. Nitrogen is a p-block element

Answer: C



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19. Which one of the following is an incorrect statement?

A. The ionisation potential of nitrogen is greater than that of oxygen

B. The electron affinity of fluorine is greater than that of chlorine.

C. The ionisation potential of beryllium is greater than that of boron

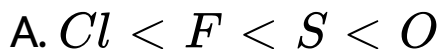
D. The electronegativity of fluorine is greater than that of chlorine.

Answer: B



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20. Which one of the following arrangements represents the correct order of electron gain enthalpy of the given atomic species?



B. $S < O < Cl < F$

C. $O < S < F < Cl$

D. $F < Cl < O < S$

Answer: C



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21. Electron affinity is the lowest for

A. Nitrogen

B. carbon

C. Oxygen

D. sulphur

Answer: B



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22. Electron affinity is the

A. Energy absorbed when an electron is added to an isolated atom in the gaseous state.

B. Energy released when an electron is added to an isolated atom in the gaseous state

C. Energy required to take out an electron from an isolated gaseous atom

D. Power of an atom to attract an electron to itself.

Answer: B



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23. Arrange S , O and Se in ascending order of electron affinity?

A. $Se < S < O$

B. $O < Se < S$

C. $S < O < Se$

D. $S < Se < O$

Answer: B



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24. Which one of the elements has the maximum electron affinity?

A. F

B. Cl

C. Br

D. I

Answer: B



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25. The electron affinity values for the halogens shown the following trend

A. $F < Cl > Br > I$

B. $F < Cl < Br < I$

C. $F > Cl > Br > I$

D. $F < Cl > Br < I$

Answer: A



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26. Which among the following factors is the most important in making fluorine oxidizing halogen?

A. Hydration enthalpy

B. Ionisation enthalpy

C. Electrons affinity

D. Bond dissociation energy

Answer: D



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27. Which element has maximum electron affinity?

A. *Na*

B. *S*

C. *Mg*

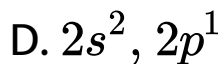
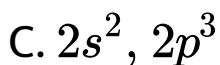
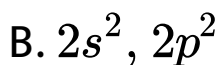
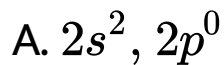
D. *Al*

Answer: B



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28. Highest electron-affinity is associated with the configuration



Answer: B



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29. Which of the following pairs show reverse properties on moving along a period from left to right and from top to down in a group?

- A. Nuclear charge and electron affinity
- B. Ionisation energy and electron affinity
- C. Atomic radius and electron affinity
- D. None of these

Answer: C



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30. Which of the following has the least electron affinity in kJmol^{-1} ?

A. Oxygen

B. carbon

C. Nitrogen

D. Boron

Answer: C



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31. Which of the following properties show gradual decrease with increase in atomic number across a period in the periodic table?

- A. Electron affinity
- B. Ionisation potential
- C. Electronegativity
- D. Size of atom

Answer: D



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32. Fluorine has lower electron affinity than chlorine because of

- A. Smaller radius of fluorine, high density
- B. Smaller radius of chlorine, high density
- C. Bigger radius of fluorine, less density
- D. Smaller radius of chlorine, less density

Answer: A



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33. For electron affinity of halogens which of the following is correct

A. $Br > F$

B. $F > Cl$

C. $Br < Cl$

D. $F > I$

Answer: C



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34. the correct order of electron gain enthalpy with negative sign of F , Cl , Br and I , having atomic number 9, 17, 35 and 53 respectively is

A. $I > Br > Cl > F$

B. $F > Cl > Br > I$

C. $Cl > F > Br > I$

D. $Br > Cl > I > F$

Answer: C



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Electronegativity And Nature Of Oxides

1. If the ionisation potential is IP , electron affinity is EA and electronegative is X , which of the following relation is correct?

A. $2X - EA - IP = 0$

B. $2EA - X - IP = 0$

C. $2IP - X - EA = 0$

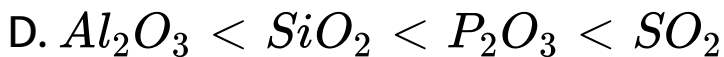
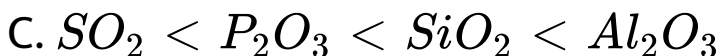
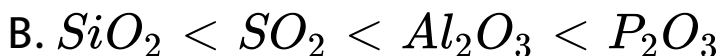
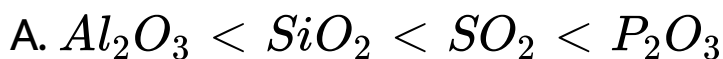
D. All of these

Answer: A



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2. Among Al_2O , SiO_2 , P_2O_3 and SO_2 the correct order of acid strength is



Answer: D



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3. The polarising ability of which one of the following is the highest

A. Small highly +ve ion

B. Large +ve ion

C. Small highly -ve ion

D. Large -ve ion

Answer: A



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4. When we move from left to right in a period
electropositive character

A. Increases

B. Decrease

C. No change

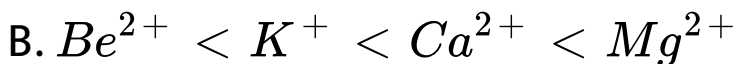
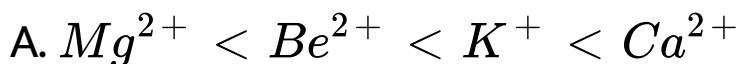
D. First increase then decreases

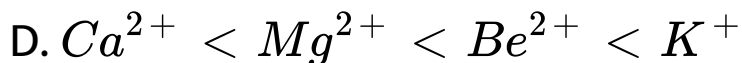
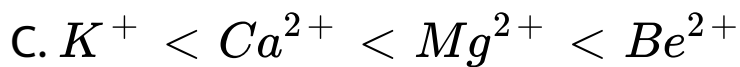
Answer: B



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5. The charge / size ratio of a cation determines its polarizing power. Which one of the following sequence represents the increasing order of the polarizing power of the cationic species, K^+ , Ca^{2+} , Mg^{2+} , Be^{2+} ?





Answer: C



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6. Which of the following has no unit?

A. Electro negativity

B. Electron affinity

C. Ionisation energy

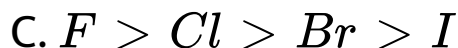
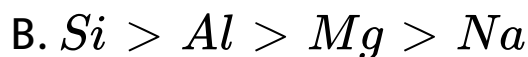
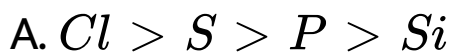
D. Excitation potential

Answer: A



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7. Which is not the correct order of electronegativity?



D. None of these

Answer: D



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8. Which one of the following has the highest electronegativity?

A. *Br*

B. *Cl*

C. *P*

D. *Si*

Answer: B



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9. Which of the following oxide is amphoteric?

A. *GeO₂*

B. *SnO₂*

C. *CO₂*

D. *SiO₂*

Answer: B



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10. In the following, the element with the highest electropositivity is

A. Copper

B. Caesium

C. Barium

D. Chromium

Answer: B



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11. Pauling 's electronegativity scale is based upon experimental values of

- A. Atomic radii
- B. Bond energies
- C. Electronegativities
- D. Electron affinity

Answer: B



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12. In C , N , O and F the electronegativity

A. Decrease from carbon to fluorine

B. Increases from carbon to fluorine

C. Increases from carbon to oxygen and then decreases

D. Decreases from carbon to oxygen and then increases

Answer: B



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13. With increasing atomic number in a certain period

A. the chemical reactivity decreases

B. The chemical reactivity character

increase

C. the electropositive character increases

D. the electronegative character increase

Answer: D



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14. An element of atomic mass 40 has 2, 8, 8, 2, as the electronic configuration. One of the

following statement regarding this elements
is not correct?

- A. It forms a basic oxide
- B. It belongs to IIA group
- C. It belongs to IVA period
- D. It forms an acidic oxide

Answer: D



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15. Which of the following properties displays progressive increase with the rise in atomic number across a period in the periodic table?

- A. Electronegativity
- B. Electron affinity
- C. Ionisation potential
- D. Size of the atom

Answer: A



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16. Diagonal relationship is shown by

A. Elements of second period

B. elements of second period

C. Both (a) and (b)

D. Elements of first period

Answer: C



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17. The solubilities of carbonates decreases down the magnesium group due to a decrease in

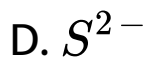
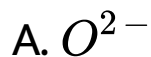
- A. Lattice energies of cations
- B. Hydration energies cations
- C. Inter-ionic attraction
- D. Entropy of solution formation

Answer: B



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18. Which of the following denegative anion is quite common?

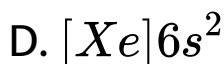
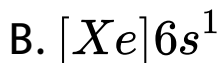


Answer: A



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19. Which one of the following represents the electronic configuration of the most electropositive element?



Answer: B



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20. Which one of the following combination represent a metallic element?

A. 2, 8, 7

B. 2, 8, 2

C. 2, 8, 4

D. 2, 8, 8

Answer: B



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21. Beryllium and aluminium exhibit many properties which are similar . But, the two elements differ in

A. Forming covalent halides

B. Forming polymeric hydrides

C. Exhibiting maximum covalency in
compounds

D. Exhibiting amphoteric nature in their
oxides

Answer: C



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22. *Mg* and *Li* are similar in their properties due to

- A. Same ionic potential
- B. same electron affinity
- C. Same group
- D. Same e/m ratio

Answer: A



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23. Which of the following set has the strongest tendency to form anions?

A. *Ga, In* and *Te*

B. *Na, Mg* and *Al*

C. *N, O* and *F*

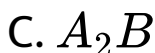
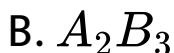
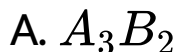
D. *V, Cr,* and *Mn*

Answer: C



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24. 3 and 6 electrons are present in the outermost orbit A and B respectively. The chemical formula of its compound will be



Answer: B



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25. Keeping in view the peroidic law and the periodic table suggest which of the following elements should have the maximum electronegative character

A. *Bi*

B. *As*

C. *P*

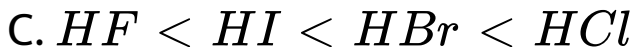
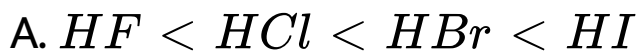
D. *Sb*

Answer: C



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26. Increasing order of acid strength of halogen acid is



D. None of these

Answer: A



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27. Which of the following is the most electropositivite element?

A. aluminium

B. phosphorus

C. Magnesium

D. sulphur

Answer: C



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28. The basis of keeping the elements in the group of periodic table is

A. Ionisation potential

B. Electronegativity

C. Electron affinity

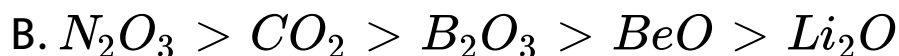
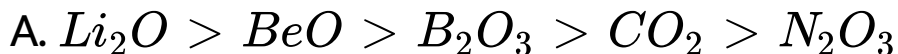
D. Number of electrons in the valence shell

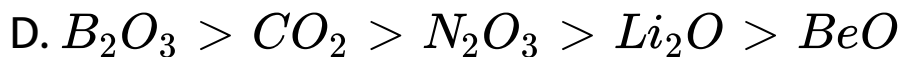
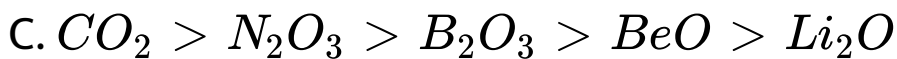
Answer: D



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29. Which of the following sequence correctly represents the decreasing acidic nature of oxides?





Answer: B



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30. which of the following gas does not have an octet or eight electrons in the outer shell?

A. *Ne*

B. *Ar*

C. Rn

D. He

Answer: D



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31. Oxidising action increases in halogen in the following order

A. $Cl < Br < I < F$

B. $Cl < I < Br < F$

C. $I < F < Cl < Br$

D. $I < Br < Cl < F$

Answer: D



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32. the maximum valency of an element with atomic number 7 is

A. 2

B. 5

C. 4

D. 3

Answer: B



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33. which one of the following oxides is neutral?

A. SiO_2

B. SnO_2

C. ZnO

D. CO

Answer: D



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34. which of the following is the correct order of gradually decreasing basic nature of the oxides?

A. Al_2O_3 , MgO , Cl_2O_7 , SO_3

B. MgO , Al_2O_3 , SO_3 , Cl_2O_7

C. Cl_2O_7 , SO_3 , Al_2O_3 , MgO

D. SO_3 , Cl_2O_7 , MgO , Al_2O_3

Answer: B

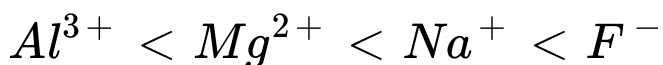


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35. In which of the following arrangements ,
the order is not correct according to the
property indicated against it:

A. Increasing

size:



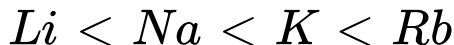
B. Increasing IE_1 : $B < C < N < O$

C. Increasing EA_1 : $I < Br < F < Cl$

D. Increasing

metallic

radius:



Answer: B



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36. The strongest reducing agent is

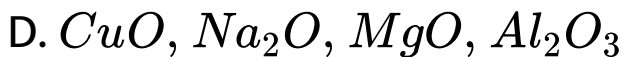
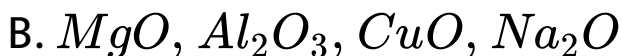
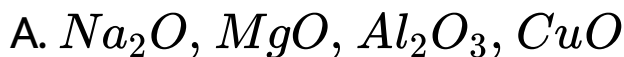


Answer: D



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37. The order in which the following oxides are arranged according to decreasing basic nature is



Answer: A



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38. Acidity of pentoxides in VA group

A. Decreases

B. Increases

C. Remains same

D. None

Answer: A



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39. Which of the following statement is correct with respect to the property of elements with an increase in atomic number in the carbon family (group 14)?

A. Atomic size decrease

B. Stability of + 2 oxidation state increases

C. Metallic character decreases

D. Ionisation energy increases

Answer: B



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40. The ionic mobility of alkali metal ions in aqueous solution is maximum for:



Answer: C



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41. The following statements regarding the periodic trends of chemical reactivity of the alkali metals and the halogens are given. Which of these statement gives the correct picture:

A. In alkali metals , the reactivity increases in atomic number down the group

B. The reactivity decreases in the alkali metals, but increases in halogens with

increases in atomic number down the group

C. In both alkali metals and the halogens, the chemical reactivity decreases with increase in atomic number down the group.

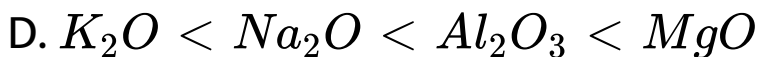
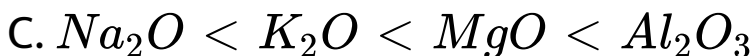
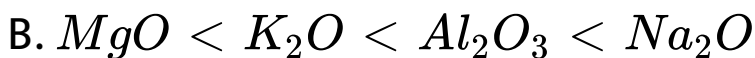
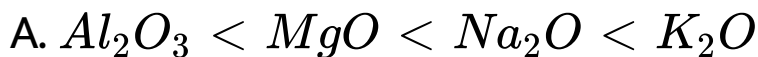
D. Chemical reactivity increases in atomic number down the group in both the alkali metals and halogens.

Answer: A



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42. Which one of the following orders presents the correct sequence of the increasing basic nature of the given oxides ?



Answer: A



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Section B Assertion Reasoning

1. Assertion: Ionisation potential of Be (atomic no.4) is less than B (atomic no.5).

Reason: The first electron released from Be is of p-orbital but that from B is of s-orbital.

A. If both assertion and reason are true and reason is the correct explanation of

assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D



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2. Assertion: Helium has the highest value of ionisation energy among all known elements.

Reason: Helium has the highest value of electron affinity among all known elements.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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3. Assertion: the decreasing order of acidic character of CO_2 , N_2O_5 , SiO_2 and SO_3 is $SO_3 > N_2O_5 > CO_2 > SiO_2$.

Reason: Acidic character of oxides increases on moving top of bottom in a group and

decreases on moving left to right in a periodic
in modern periodic table.

A. If both assertion and reason are true
and reason is the correct explanation of
assertion

B. If the assertion and reason are true but
reason is not the correct explanation of
assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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4. Assertion: NO is an acidic oxide while CrO_3 is a basic oxide.

Reason: Oxides of metals are generally basic and oxides of non-metals are generally acidic.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D



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5. Assertion: F is more electronegative than Cl .

Reason: F has high electron affinity than Cl .

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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6. Assertion: E° for Mn^{3+} / Mn^{2+} is more positive than Cr^{3+} / Cr^{2+}

Reason: The third ionisation energy of Mn is larger than that of Cr .

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B



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7. Assertion: The ionic size of O^{2-} is bigger than that of F^{-} ions.

Reason: O^{2-} and F^{-} are isoelectronic ions.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B



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8. Assertion: The ionic radii follows the order:

$$I^- < I < I^+.$$

Reason: The smaller the value of Z/e the larger the size of the species.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D



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9. Assertion: Sixth period is the longest period in the periodic table.

Reason : Sixth period involves the filling of all the orbitals of the sixth energy level.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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10. Assertion: Electron gain enthalpy always becomes less negative as we go down a group in Modern periodic table.

Reason: The size of the atom increase on

going down the group in Modern periodic table and the added electron would be farther from the nucleus.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D



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11. Assertion: Electron gain enthalpy value of the 3rd period p-block elements of the modern periodic table are generally more negative than the 2nd period element of the same group.

Reason: Due to smaller atomic size of the 2nd

period element, its electron density is high which eases the addition of electron.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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12. Assertion: Of the elements, helium has the highest value of first ionisation enthalpy.

Reason : Helium has the most positive electron gain enthalpy of all the elements.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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13. Assertion: The first ionisation enthalpy of aluminium is lower than that of magnesium.

Reason : Ionic radius of aluminium is smaller than that of magnesium.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B



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14. Assertion: Helium and beryllium have similar outer electronic configuration of the type ns^2 .

Reason: Both are chemically inert.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If the assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false.
- D. If assertion is false but reason is true.

Answer: C



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15. Assertion: the $4f^{-}$ and $5f^{-}$ inner transition series of elements are placed separately at the bottom of the modern periodic table.

Reason : (i) Position of f-block elements prevents the undue expansion of the modern periodic table, ie, maintains its structure.

(ii) Position of f-block elements preserves the principle of classification by keeping elements with similar properties in a single column.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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16. Assertion: The atomic radii of the elements of the oxygen family are smaller than the atomic radii of corresponding elements of the nitrogen family.

Reason: The members of the oxygen family are more electronegative because they have lower values of nuclear charge, than those of the nitrogen family.

A. If both assertion and reason are true and reason is the correct explanation of

assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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17. Assertion: F atom has less negative electron gain enthalpy than Cl atom.

Reason: Additional electrons are repelled more effectively by 3 p-electrons in Cl than by 2 p-electrons in F atom.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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18. Assertion: The first ionisation energy of Be is greater than that of B .

Reason: 2p-orbital is lower in energy than 2s-orbital.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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19. Assertion: In general, for an element,
 $IE_1 < IE_2 < IE_3 \dots$

Reason: After the removal of each successive electron remaining electrons are held more tightly by the nucleus so removal of next electron becomes difficult.

A. If both assertion and reason are true
and reason is the correct explanation of
assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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20. Assertion: Generally, ionisation enthalpy than beryllium.

Reason: When successive electrons are added to the orbitals in the same principle quantum level, the shielding effect of inner core of electrons does not increase very much to compensate for the increased attraction of the electron to the nucleus.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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21. Assertion: Boron has a smaller first ionisation enthalpy than beryllium.

Reason: The penetration of a $2s$ electron to the nucleus is more than the $2p$ electron, hence $2p$ electron is more shielded by the inner core of electrons than the $2s$ electrons.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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22. Assertion: Metallic character of first group metals of Modern periodic table increase on moving down the group.

Reason: On moving top to bottom in first group in Modern periodic table, value of ionisation enthalpy continuously decreases.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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Aipmt Neet Questions

1. Which of the following order is incorrect?

A. Acid nature , $NH_3 < PH_3 > AsH_3$

B. IE_1 , $Li < Be < B < C$

C. Basic nature ,

$Al_2O_3 < MgO < Na_2O < K_2O$

D. Ionic radius : $Li^+ < Na^+ < K < Cs^+$

Answer: B



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2. Among K , Ca , Fe and Zn the element which can form more than one binary compound with chlorine is

A. Fe

B. Zn

C. K

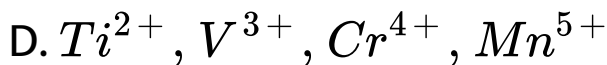
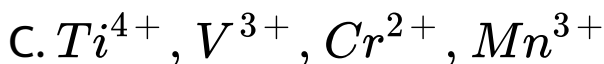
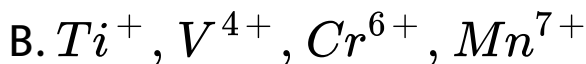
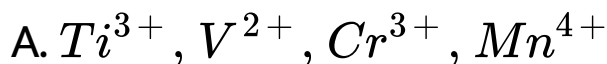
D. Ca

Answer: A



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3. Among the following series of transition metals ions, the one where all metal ions have $3d^2$ electronic configuration is:



Answer: D



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4. Lanthanoid are:

A. 14 elements in the sixth period (
*at. no.*90 to 103) that have 4f-subshell

B. 14 elements in the seventh period
(*at. no.*90 to 103) that have 5f –
subshell

C. 14 elements in the sixth period (
*at. no.*58 to 71) that have 4f-subshell

D. 14 elements in the seventh period (*at. no.* 58 to 71) that have 4f-subshell

Answer: C



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5. Identify the incorrect statement among the following:

A. Lanthanoids contraction is the accumulation of successive linkages.

B. as a result of lanthanoids contraction
the properties of $4d$ series of the
transition elements have no similarities
with the $5d$ series of transition
elements.

C. shielding power of $4f$ electrons is quite
weak

D. there is a decreases in the radii of the
atoms or ions as one proceeds from La
to Lu

Answer: B



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6. Which of the following exhibits only +3 oxidation state?

A. *U*

B. *Th*

C. *Pa*

D. *Ac*

Answer: D



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7. Which of the following lanthanoids ions is diamagnetic?

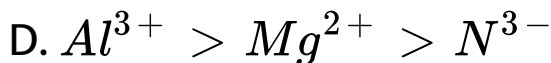
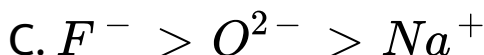
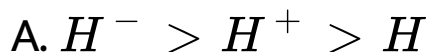


Answer: D



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8. Which of the following orders of ionic radii is correctly represented?

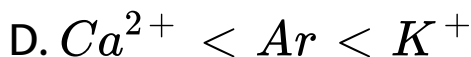
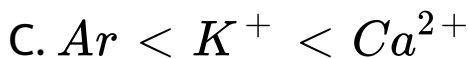
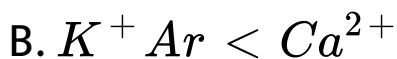


Answer: A



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9. The species Ar , K^+ and Ca^{2+} contain the same number of electrons. In which order do their radii increase ?

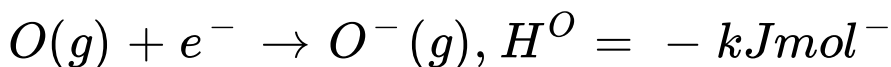
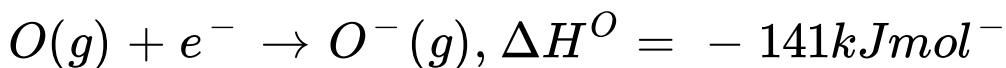


Answer: A



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10. 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 electrons in oxygen result 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: C



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

A. $Li < Na < K < Rb$ (increasing metallic radius)

B. $Al^{3+} < Mg^{2+} < Na^+ < F^-$
(increasing ionic size)

C. $B < C < N < O$ (increasing first ionization enthalpy)

D. $I < Br < Cl < F$ (increasing electron gain enthalpy)

Answer: C::D



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12. The element $Z = 114$ has been discovered recently. It will belong to which of the family / group and electronic configuration ?

A. Carbon family, $[Rn]5f^{14}6d^{10}7s^27p^2$

B. Oxygen family, $[Rn]5f^{14}6d^{10}7s^27p^4$

C. Nitrogen family, $[Rn]5f^{14}6d^{10}7s^27p^6$

D. Halogen family, $[Rn]5f^{14}6d^{10}7s^27p^5$

Answer: A



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13. Which of the following oxide is most acidic in nature?

A. MgO

B. BeO

C. BaO

D. CaO

Answer: B



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Aiims Questions

1. Which of the following is the atomic number of a metal?

A. 32

B. 34

C. 36

D. 38

Answer: D



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2. Which of the following statement is not correct regarding hydrogen atom?

A. It resembles halogens in some properties

B. it resembles alkali metals in some properties

C. it can be placed in 7th group of periodic table

D. it cannot be placed in first group of periodic table

Answer: D



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3. The lightest metal is

A. *Li*

B. *Mg*

C. *Ca*

D. *Na*

Answer: A



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4. The radii of F , F^- , O and O^{2-} are in the order of

A. $O^{2-} > F^- > O > F$

B. $O^{2-} > F^- > F > O$

C. $F^- > O^{2-} > F > O$

D. $O^{2-} > O > F^- > F$

Answer: A



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5. Which has the maximum atomic radius?

A. *Al*

B. *Si*

C. *P*

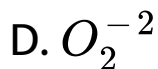
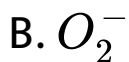
D. *Mg*

Answer: D



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6. Which of the following ion is the smallest ion is the smallest ion?



Answer: A



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7. Which of the following has largest radius?



Answer: A



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8. Which of the following gaseous atoms has highest value of IE ?

A. P

B. Si

C. Mg

D. Al

Answer: A



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9. Ionisation energy is highest for

A. noble gases

B. platinum metals

C. transition elements

D. inner-transition elements

Answer: A



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10. Among the following options , the sequence of increasing first ionisation potential will be

A. $B < C < N$

B. $B > C > N$

C. $C < B < N$

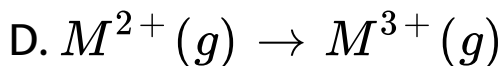
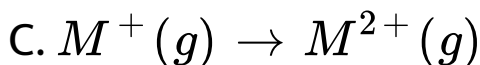
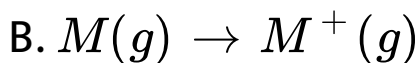
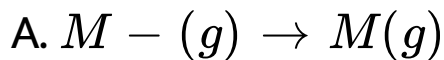
D. $N > C > B$

Answer: A



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11. Which of the following transitions involves maximum amount of energy?



Answer: D



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12. Which has the highest second ionisation potential?

A. Nitrogen

B. carbon

C. Oxygen

D. Fluorine

Answer: C



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13. *Mg* and *Li* are similar in their properties due to

- A. Same e/m ratio
- B. same electron affinity
- C. Same group
- D. Same ionic potential

Answer: D



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14. For electron affinity of halogens which of the following is correct

A. $Br > F$

B. $F > Cl$

C. $Br < Cl$

D. $F < I$

Answer: C



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15. Which one of the elements has the maximum electron affinity?

A. *F*

B. *Cl*

C. *Br*

D. *I*

Answer: B



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16. Order of electron affinity of F , Cl , Br and I is

A. $F < Cl > Br > I$

B. $F > Cl > Br > I$

C. $F < Cl < Br < I$

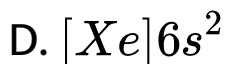
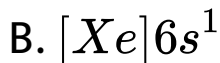
D. $F > Cl > Br > I$

Answer: A



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17. Which one of the following represents the electronic configuration of the most electropositive element?



Answer: B



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18. Which of the following is the most electropositive element?

A. aluminium

B. Magnesium

C. phosphorus

D. sulphur

Answer: B



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19. Which of the following has no unit?

- A. Electronegativity
- B. Electron affinity
- C. Ionisation energy
- D. Excitation potential

Answer: A



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20. Which of the following set has the strongest tendency to form anions?

A. *Ga, In* and *Te*

B. *Na, Mg* and *Al*

C. *N, O* and *F*

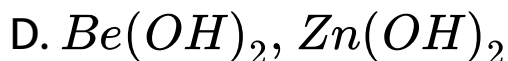
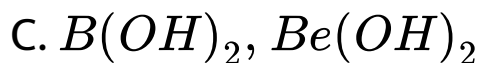
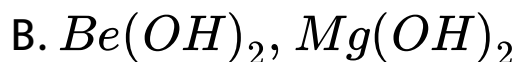
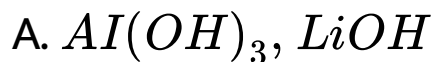
D. *V, Cr,* and *Mn*

Answer: C



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21. The pair of amphoteric hydroxides is

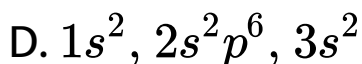
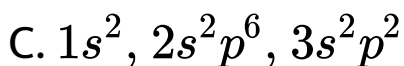
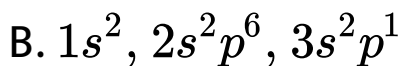
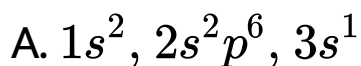


Answer: D



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22. A sudden jump between the values of second and third ionisation energies of an atom would be associated with the electronic configuration.



Answer: D



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23. If the degree of ionization of water is 1.8×10^{-9} at $298K$. Its ionization constant will be

A. 1.8×10^{-16}

B. 1×10^{-14}

C. 1×10^{-16}

D. 1.67×10^{-14}

Answer: A





24. Ionisation potential of hydrogen atom is 13.6eV . Hydrogen atom in ground state is excited by monochromatic light of energy 12.1eV . The spectral lines emitted by hydrogen according to Bohr's theory will be

- A. One
- B. two
- C. three
- D. four

Answer: C



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Assertion Reasoning Questions

1. Assertion: The atomic radii of calcium is smaller than sodium

Reason: Calcium has a lower nuclear charge than sodium.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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2. Assertion: The first ionisation energy of aluminium is lower than that of magnesium.

Reason: The ionic radius of aluminium is smaller than that of magnesium.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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3. Assertion: Electrons are ejected from a certain metal when either blue or violet light strikes the metal surface. However only violet light cause electron ejection from a second

metal.

Reason: The electrons in the first metal requires less energy for ejection.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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4. Assertion :First ionization energy is lower than oxygen.

Reason :Across a period effective charge decreases.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D



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Section D Chapter End Test

1. Which of the following statement is correct with respect to the property of elements with an increase in atomic number in the carbon family (group 14)?

A. Atomic size decrease

B. Ionisation energy increase

C. Metallic character decreases

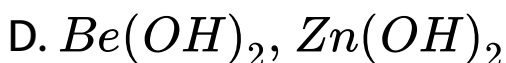
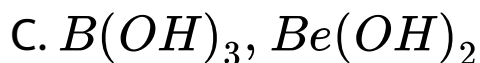
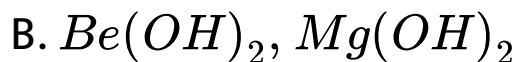
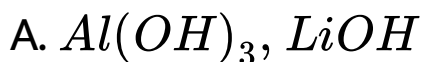
D. Stability of +2 oxidation state increase.

Answer: D



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2. The pair of amphoteric hydroxides is



Answer: D



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3. Which of the following oxides is amphoteric in nature ?



Answer: D



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4. Which has the highest melting point?



Answer: B



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5. In which of the following arrangements, the order is not correct according to the property indicated against it:

A. $Al^{3+} Mg^{2+} < Na^{+} < F^{-}$: Increasing ionic size

B. $B < C < N < O$: Increasing enthalpy

C. $I < Br < F < Cl$: Increasing electron gain enthalpy (with negative sign)

D. $Li < Na < K < Cl$: Increasing

metallic radius

Answer: B



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6. 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: B



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7. What will be the order of first ionisation energy?

A. $Li > Na > K$

B. $K > Li > Na$

C. $Na > Li > K$

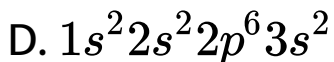
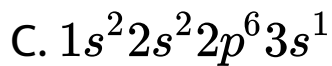
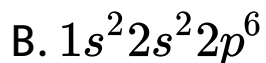
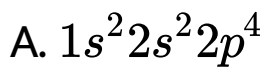
D. $Li > K > Na$

Answer: A



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8. which of the following configurations represents atoms of the elements having the highest second ionisation energy?



Answer: C



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9. The first ionisation potential in electron volts of nitrogen and oxygen atoms are respectively given by

A. 14.6, 13.6

B. 13.6, 14.6

C. 13.6, 13.6

D. 14.6, 14.6

Answer: A



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10. The elements which occupy the peaks of ionisation energy curve are

A. *Na, K, Rb, Cs*

B. *Na, Mg, Cl, I*

C. *Cl, Br, I, F*

D. *He, Ne, Ar, Kr*

Answer: D



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11. Which is the correct order of ionic sizes (At,

No : $Ce = 58, Sn = 50, Yb = 70$ and

$Lu = 71$)?

A. $Ce > Sn > Yb > Lu$

B. $Sn > Ce > Lu > Yb$

C. $Lu > Yb > Sn > Ce$

D. $Sn > Yb > Ce > Lu$

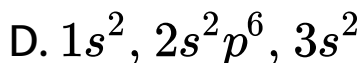
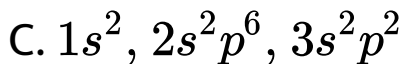
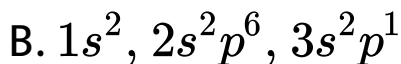
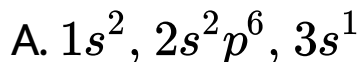
Answer: B



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12. A sudden large jump between the values of second and third ionisation energies of an

element would be associated with the electronic configuration

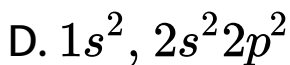
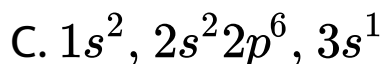
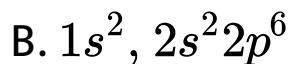
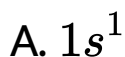


Answer: D



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13. Which element having the following electronic configuration has minimum ionisation potential?

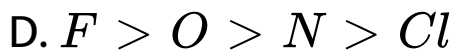
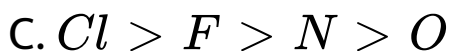
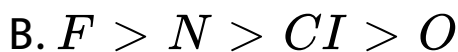
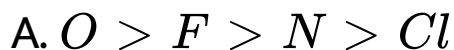


Answer: C



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14. Arrange F , Cl , O , N in the decreasing order of electronegativity



Answer: D



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

A. Ionic

B. covalent

C. Coordinate

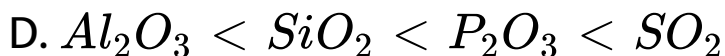
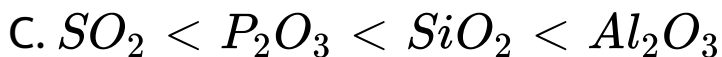
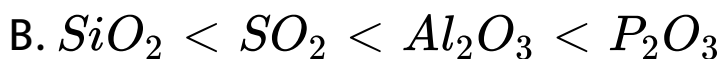
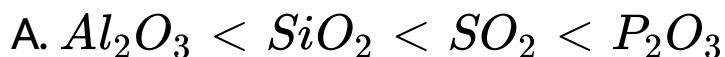
D. Metallic

Answer: A



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16. Among Al_2O_3 , SiO_2 , P_2O_3 and SO_2 the correct order of acid strength is

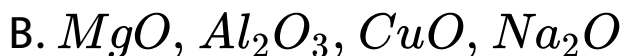
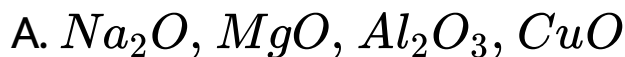


Answer: D



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17. The order in which the following oxides are arranged according to decreasing basic nature is



Answer: A



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18. *Be* and *Al* exhibit many properties which are similar. But the two elements differ in

A. Forming covalent halides

B. Forming polymeric hydrides

C. Exhibiting maximum covalency in compounds

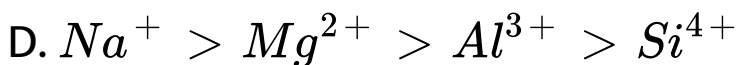
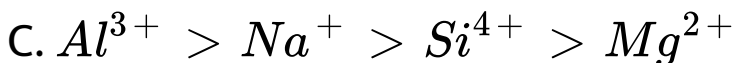
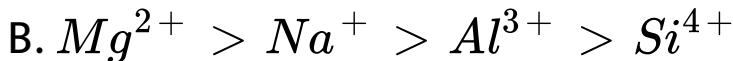
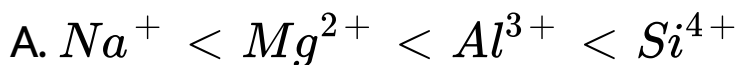
D. Exhibiting amphoteric nature in their oxides

Answer: C



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19. The order of magnitude of ionic radii of ions Na^+ , Mg^{2+} , Al^{3+} and Si^{4+} is



Answer: D



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20. The order of the magnitude of first ionisation potentials of Be , B , N and O is

A. $N > O > Be > B$

B. $N > Be > O > B$

C. $Be > B > N > O$

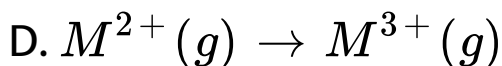
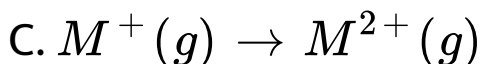
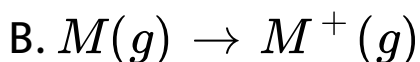
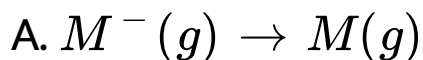
D. $B > Be > O > N$

Answer: A



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21. Which of the following transitions involves maximum amount of energy?



Answer: D



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22. *Mg* and *Li* are similar in their properties due to

- A. Same e/m ratio
- B. same electron affinity
- C. Same group
- D. Same ionic potential

Answer: D



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23. Which among the following elements have the lowest value of IE_1 ?

A. *Pb*

B. *Sn*

C. *Si*

D. *C*

Answer: B



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24. The first ionisation potential is maximum for

A. *B*

B. *N*

C. *O*

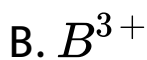
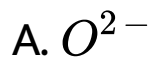
D. *Be*

Answer: B



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25. Which of the following has the highest ionic radius?



Answer: A



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26. Ionic radii are

A. Directly proportional to effective nuclear charge

B. Directly proportional to square of effective nuclear charge

C. Inversely proportional to effective nuclear charge

D. Inversely proportional to square of effective nuclear charge.

Answer: C



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27. The most common oxidation states of cerium are

A. + 2, + 3

B. + 2, + 4

C. + 3, + 4

D. + 3, + 5

Answer: C



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28. Assertion: The first ionisation energy of Be is greater than that of B .

Reason: 2p-orbital is lower in energy than 2s-orbital.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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29. Assertion: Shielding effect increases as we go down the group.

Reason: More is the number of electrons in the penultimate shell, more is shielding.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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30. Assertion: Ionisation potential across the period is $Na < Al < Mg < Si$.

Reason : Ionisation potential decreases with decrease in atomic size.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If the assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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