



GMR CLASSES

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We proves the difference...

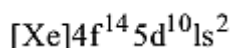
CLASSIFICATION OF ELEMENTS & PERIODICITY IN PROPERTIES

1. Pauling's electronegativity values for elements are useful in predicting

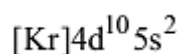
- (a) Polarity of the molecules
- (b) Position in the E.M.F. series
- (c) Coordination numbers
- (d) Dipole moments.

2. The electronic configuration of four elements are given below. Which elements does not belong to the same family as others?

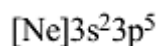
(a)



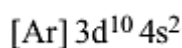
(b)



(c)



(d)



3. In the periodic table, with the increase in atomic number, the metallic character of an element

- (a) Decreases in a period and increases in a group
- (b) Increases in a period and decreases in a group
- (c) Increases both in a period and the group
- (d) Decreases in a period and the group.

4. Elements of which of the following groups will form anions most readily?

- (a) Oxygen family
- (b) Nitrogen family
- (c) Halogens
- (d) Alkali metals

5. Which of the following sets has strongest tendency to form anions?

- (a) Ga, In, Tl
- (b) Na, Mg, Al
- (c) N, O, F
- (d) V, Cr, Mn

6. One would expect proton to have very large

- (a) Charge
- (b) Ionization potential
- (c) Hydration energy
- (d) Radius.

7. Na^+ , Mg^{++} , Al^{3+} and Si^{4+} are isoelectronic. The order of their ionic size is

- (a) $\text{Na}^+ > \text{Mg}^{++} < \text{Al}^{3+} < \text{Si}^{4+}$
- (b) $\text{Na}^+ < \text{Mg}^{++} > \text{Al}^{3+} > \text{Si}^{4+}$
- (c) $\text{Na}^+ > \text{Mg}^{++} > \text{Al}^{3+} > \text{Si}^{4+}$
- (d) $\text{Na}^+ < \text{Mg}^{++} > \text{Al}^{3+} < \text{Si}^{4+}$

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

- (a) First group
- (b) Third group
- (c) Fifth group
- (d) Seventh group.

9. In the periodic table from left to right in a period, the atomic volume

- (a) Decreases
- (b) Increases
- (c) Remains same
- (d) First decrease then increases

10. Which electronic configuration of an element has abnormally high difference between second and third ionization energy?

- (a) $1s^2, 2s^2, 2p^6, 3s^{-1}$
- (b) $1s^2, 2s^2, 2p^6, 3s^{13}p^1$
- (c) $1s^2, 2s^2, 2p^6, 3s^23p^2$
- (d) $1s^2, 2s^2, 2p^6, 3s^2$

11. One of the characteristic properties of nonmetals is that they

- (a) Are reducing agents
- (b) Form basic oxides
- (c) Form cations by electron gain
- (d) Are electronegative

12.

The electronic configuration of an element is

$1s^2 2s^2 2p^6 3s^2 3p^3$. What is the atomic number of the element, which is just below the above element in the periodic table?

(a)

33

- (b) 34
- (c) 36
- (d) 49

13. The element, with atomic number 118, will be

- (a) alkali
- (b) noble gas
- (c) lanthanide
- (d) transition element



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14. Which one of the following ions will be the smallest in size?

- (a) Na^+
- (b) Mg^{2+}
- (c) F^-
- (d) O^{2-}

15. Which of the following does not represent the correct order of the properties indicated

- (a) $\text{Ni}^{2+} > \text{Cr}^{2+} > \text{Fe}^{2+} > \text{Mn}^{2+}$ (size)
- (b) $\text{Sc} > \text{Ti} > \text{Cr} > \text{Mn}$ (size)
- (c) $\text{Mn}^{2+} > \text{Ni}^{2+} < \text{Co}^{2+} < \text{Fe}^{2+}$ (unpaired electron)
- (d) $\text{Fe}^{2+} > \text{Co}^{2+} > \text{Ni}^{2+} > \text{Cu}^{2+}$ (unpaired electron)

16. The first ionization potentials (eV) of Be and B respectively are

- (a) 8.29, 9.32
- (b) 9.32, 9.32
- (c) 8.29, 8.29
- (d) 9.32, 8.29

17. Of the given electronic configurations for the elements, which electronic configuration indicates that there will be abnormally high difference in the second and third ionization energy for the element?

- (a) $1s^2 2s^2 2p^6 3s^2$
- (b) $1s^2 2s^2 2p^6 3s^1$
- (c) $1s^2 2s^2 2p^6 3s^3 3p^1$
- (d) $1s^2 2s^2 2p^6 3s^2 3p^1$

18. Correct order of first IP among following elements Be, B, C, N, O is

- (a) $\text{B} < \text{Be} < \text{C} < \text{O} < \text{N}$
- (b) $\text{B} < \text{Be} < \text{C} < \text{N} < \text{O}$
- (c) $\text{Be} < \text{B} < \text{C} < \text{N} < \text{O}$
- (d) $\text{Be} < \text{B} < \text{C} < \text{O} < \text{N}$

19. Which of the following order is wrong?

- (a) $\text{NH}_3 < \text{PH}_3 < \text{AsH}_3$ – Acidic
- (b) $\text{Li} < \text{Be} < \text{B} < \text{C}$ – First IP
- (c) $\text{Al}_2\text{O}_3 < \text{MgO} < \text{Na}_2\text{O} < \text{K}_2\text{O}$ – Basic
- (d) $\text{Li}^+ < \text{Na}^+ < \text{K}^+ < \text{Cs}^+$ – Ionic radius

20. An atom has electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^6 3d^4 4s^2$, you will place it in which group?

- (a) Fifth
- (b) Fifteenth
- (c) Second
- (d) Third

21. Which of the following statements is true?

- (a) Silicon exhibits 4 coordination number in its compound
- (b) Bond energy of F_2 is less than Cl_2

(c) Mn(III) oxidation state is more stable than Mn(II) in aqueous state

(d) Elements of 15th group shows only +3 and +5 oxidation states

22. 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

23. Ionic radii are

- (a) inversely proportional to effective nuclear charge
- (b) inversely proportional to square of effective nuclear charge
- (c) directly proportional to effective nuclear charge
- (d) directly proportional to square of effective nuclear charge

24. Which one of the following oxides is expected to exhibit paramagnetic behaviour?

- (a) CO_2
- (b) SiO_2
- (c) SO_2
- (d) ClO_2

25. Which one of the following arrangements represents the correct order of electron gain enthalpy (with negative sign) of the given atomic species?

- (a) $\text{S} < \text{O} < \text{Cl} < \text{F}$
- (b) $\text{Cl} < \text{F} < \text{S} < \text{O}$
- (c) $\text{F} < \text{Cl} < \text{O} < \text{S}$
- (d) $\text{O} < \text{S} < \text{F} < \text{Cl}$

26. Identify the correct order of the size of the following:

- (a) $\text{Ca}^{2+} < \text{K}^+ < \text{Ar} < \text{Cl}^- < \text{S}^{2-}$
- (b) $\text{Ar} < \text{Ca}^{2+} < \text{K}^+ < \text{Cl}^- < \text{S}^{2-}$
- (c) $\text{Ca}^{2+} < \text{Ar} < \text{K}^+ < \text{Cl}^- < \text{S}^{2-}$
- (d) $\text{Ca}^{2+} < \text{K}^+ < \text{Ar} < \text{S}^{2-} < \text{Cl}^-$

27. Which of the following electronic configuration an atom has the lowest ionisation enthalpy?

- (a) $1s^2 2s^2 sp^3$
- (b) $1s^2 2s^2 2p^5 3s^1$
- (c) $1s^2 2s^2 2p^6$
- (d) $1s^2 2s^2 2p^5$

28. Which one of the following ionic species has the greatest proton affinity to form stable compound?

- (a) NH_2^-
- (b) F^-
- (c) I^-
- (d) HS^-



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29. The stability of + 1 oxidation state increases in the sequence:

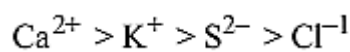
- (a) Tl < In < Ga < Al
- (b) In < Tl < Ga < Al
- (c) Ga < In < Al < Tl
- (d) Al < Ga < In < Tl

30. Amongst the elements with following electronic configurations, which one of them may have the highest ionization energy?

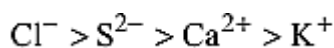
- (a) Ne [3s² 3p²]
- (b) Ar [3d¹⁰ 4s² 4p³]
- (c) Ne [3s² 3p¹]
- (d) Ne [3s² 3p³]

31. The correct order of the decreasing ionic radii among the following isoelectronic species are:

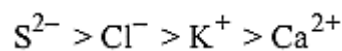
(a)



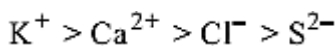
(b)



(c)



(d)



32. Which of the following represents the correct order of increasing electron gain enthalpy with negative sign for the elements O, S, F and Cl?

- (a) Cl < F < O < S
- (b) O < S < F < Cl
- (c) F < S < O < Cl
- (d) S < O < Cl < F

33. Among the elements Ca, Mg, P and Cl, the order of increasing atomic radii is:

- (a) Ca < Mg < P < Cl
- (b) Mg < Ca < Cl < P
- (c) Cl < P < Mg < Ca
- (d) P < Cl < Ca < Mg

34. What is the value of electron gain enthalpy of Na+ if IE₁ of Na = 5.1 eV?

- (a) -5.1 eV
- (b) -10.2 eV
- (c) +2.55 eV
- (d) +10.2 eV

35. Identify the wrong statement in the following:

- (a) Amongst isoelectronic species, smaller the

positive charge on the cation, smaller is the ionic radius.

(b) Amongst isoelectronic species, greater the negative charge on the anion, larger is the ionic radius.

(c) Atomic radius of the elements increases as one moves down the first group of the periodic table.

(d) Atomic radius of the elements decreases as one moves across from left to right in the 2nd period of the periodic table.

36. Which one of the following arrangements represents the correct order of least negative to most negative electron gain enthalpy for C, Ca, Al, F and O?

- (a) Ca < Al < C < O < F
- (b) Al < Ca < O < C < F
- (c) Al < O < C < Ca < F
- (d) C < F < O < Al < Ca



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Solutions :

1.

Ans: (a)

2.

Ans: (c)

3.

Ans: (a)

4.

Ans: (c)

5.

Ans: (c)

6.

Ans: (c)

7.

Ans: (c)

8.

Ans: (c)

Element with Z = 33

(1s² 2s² p⁶ 3s² p⁶ d¹⁰ 4s² p³) lies in fifth (or 15th) group.

9.

Ans: (d)

10.

Ans: (d)

11.

Ans: (a)

12.

Ans: (a)

13.

Ans: (b)

Electronic configuration of element with atomic number 118 will be $[Rn]5f^{14}6d^{10}7s^27p^6$. Since its electronic configuration in the outer most orbit (ns^2np^6) resemble with that of inert or noble gases, therefore it will be noble gas element.

14.

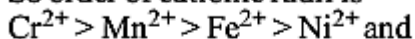
Ans: (b)

15.

Ans: (a)

In a period on moving from left to right ionic radii decreases.

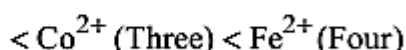
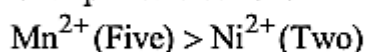
(a) So order of cationic radii is



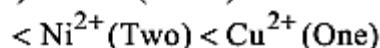
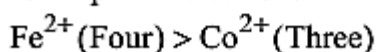
(b) $Sc > Ti > Cr > Mn$

(correct order of atomic radii)

(c) For unpaired electrons



(d) For unpaired electrons



16.

Ans: (d)

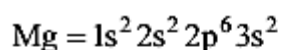
First ionisation potential of Be is greater than boron due to following configuration



Order of attraction of electrons towards nucleus $2s > 2p$, so more amount of energy is required to remove the electron with 2s-orbital in comparison to 2p orbital.

17.

Ans: (a)



After removing of 2 electron, the magnesium acquired noble gas configuration hence removing of 3rd electron will require large amount of energy.

18.

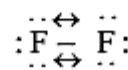
Ans: (a)

Be - $1s^2 2s^2$; B - $1s^2 2s^2 2p^1$; C - $1s^2 2s^2 2p^2$; N - $1s^2 2s^2 2p^3$; O - $1s^2 2s^2 2p^4$. IP increases along the period. But IP of Be > B. Further IP of O < N because atoms with fully or partly filled orbitals are most stable and hence have high ionisation energy.

19.

Ans: (b)

This is because of inter-electronic repulsions between lone pairs.



20.

Ans: (a)

21.

Ans: (b)

22. Ans: (a)

23.

Ans: (a)

Ionic radii are inversely proportional to effective nuclear charge.

Ionic radii in the n^{th} orbit is given as

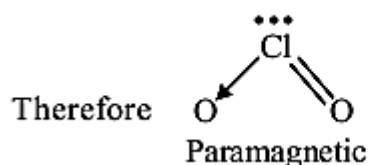
$$r_n = \frac{n^2 a_0}{Z} \text{ or } r_n \propto \frac{1}{Z}$$

when n = principal quantum number
 Z - effective nuclear charge.

24.

Ans: (d)

Due to odd number of electrons in ClO_2 .



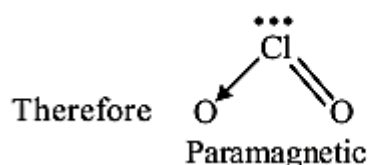
25.

Ans: (d)

26.

Ans: (a)

Due to odd number of electrons in ClO_2 .



27.

Ans: (b)

28.

Ans: (a)



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29.
Ans: (d)
30.
Ans: (d)
31.
Ans: (c)
32.
Ans: (d)
33.
Ans: (c)
34.
Ans: (a)
35.
Ans: (a)
36.
Ans: (a)

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