

	TARGET JEE (ADVANCED) : 2015	CHEMISTRY DAILY PRACTICE PROBLEMS D P P
COURSE NAME : UDAY (UB)	DATE : 05.08.2013 to 10.08.2013	DPP No. 19 & 20

* Marked Questions are having more than one correct option.

DPP No. # 19

- The ionic radii of F, F⁻, O, O²⁻ are in the order of :
(A) O²⁻ > F⁻ > F > O (B) F⁻ > O²⁻ > F > O (C) O²⁻ > O > F⁻ > F (D) O²⁻ > F⁻ > O > F
- * The correct order of radii is :
(A) N < Be < B (B) F⁻ < O²⁻ < N³⁻ (C) Na > Li < K (D) Fe²⁺ > Fe³⁺ > Fe⁴⁺
- Which one of the following pair would have a large size :
(i) K or K⁺ (ii) Br or Br⁻ (iii) O²⁻ or F⁻
(iv) Li⁺ or Na⁺ (v) P or As (vi) Na⁺ or Mg²⁺
- The ionic radii of N³⁻, O²⁻ and F⁻ are respectively given by:
(A) 1.36, 1.40, 1.71 (B) 1.36, 1.71, 1.40 (C) 1.71, 1.40, 1.36 (D) 1.71, 1.36, 1.40
- Arrange the following ions in order of their ionic radii Li⁺, Mg²⁺, K⁺, Al³⁺
- A monoatomic anion of unit charge contain 45 neutrons and 36 electrons. What is atomic mass number of element and in which group of periodic table does it lie.
- Which transition involves maximum amount of energy (M is a metal)
(A) M⁻ (g) → M (g) + e (B) M (g) → M⁺ (g) + e
(C) M⁺ (g) → M²⁺ (g) + e (D) M²⁺ (g) → M³⁺ (g) + e
- Which one of the following electronic configuration of an atom has the highest ionisation energy
(A) 1s²2s²2p³ (B) 1s²2s²2p⁶3s¹ (C) 1s²2s²2p⁶ (D) 1s²2s²2p⁵

DPP No. # 20

- The first five ionization energies of an element are 9.1, 16.2, 24.5, 35 and 205.7 eV respectively. Then number of valence electron in the atom is
(A) 2 (B) 3 (C) 4 (D) 5
- Give the correct order of initials T (true) or F (false) for following statements.
(I) Top positions of Lother-Mayer's atomic volume curve are occupied by Alkali metals.
(II) Number of elements presents in the fifth period of the periodic table are 32.
(III) 2nd I.P. of Mg is less than the 2nd I.P. of Na.
(IV) A p-orbital can take maximum of six electrons.
(A) TFTF (B) TFFT (C) FFTF (D) TTFF
- For the element X, student Surbhi measured its radius as 102 nm, Mr.Gupta as 113 nm and Mr. Agarwal as 100 nm using same apparatus. Their teacher explained that measurements were correct by saying that recorded values by three students were
(A) Crystal, vander Waal and covalent radii (B) Covalent, crystal and vander Waal radii
(C) Vander Waal, ionic and covalent (D) None is correct

- 4.* Choose the **correct** statement.
 (A) Be and Al are not in same group.
 (B) All the transition metal correspond to d-block.
 (C) Be and Al are having lot of similarities in their properties.
 (D) The atomic radius gradually decreases from Sc to Zn.
5. **Statement-1** : The ionisation potential of Sn is greater than Pb.
Statement-2 : Usually ionisation energy decreases down the group.
 (A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
 (B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
 (C) Statement-1 is true, statement-2 is false.
 (D) Statement-1 is false, statement-2 is true.
6. **Statement-1** : $(I.E.)_n$ of an atom is always greater than $(I.E.)_{n-1}$ (n is integer number)
Statement-2 : ne/Z ratio decreases on successive elimination of electrons.
 (A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
 (B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
 (C) Statement-1 is true, statement-2 is false.
 (D) Statement-1 is false, statement-2 is true.
7. **Arrange the following periodic properties with justification.**
 (a) Increasing order of first ionization energy N, O, F
 (b) Increasing order of ionization energy Cl^- , K^+ , S^{2-} , Ca^{2+}
 (c) Increasing order of ionization energy Li^+ , Be^+ , B^+ , C^+ , N^+ , O^+ , F^+
 (d) Increasing order of ionization energy Fe, Fe^{+2} , Fe^{+3}
 (e) Increasing order of first ionization potential Mg, Al, Si, Na

ANSWER KEY

DPP No. # 19

1. (D) 2.* (BCD) 3. (i) K (ii) Br^- (iii) O^{2-} (iv) Na^+ (v) As (vi) Na^+
 4. (C) 5. $Al^{3+} < Li^+ < Mg^{2+} < K^+$ 6. Atomic mass No. 80, Group No. 17
 7. (D) 8. (C)

DPP No. # 20

1. (C) 2. (A) 3. (A) 4.* (ABC) 5. (D) 6. (A)
 7. (a) $F > N > O$ (b) $S^{2-} < Cl^- < K^+ < Ca^{+2}$
 (c) $Be^+ < C^+ < B^+ < N^+ < F^+ < O^+ < Li^+$ (d) $Fe < Fe^{+2} < Fe^{+3}$ (e) $Na < Al < Mg < Si$

* Marked Questions are having more than one correct option.

DPP No. # 21

1. Which of the following relation is correct :
 (A) $2 \text{ I.P.} - \text{E.A.} - \text{E.N.} = 0$ (B) $2 \text{ I.P.} - \text{E.N.} + \text{E.A.} = 0$
 (C) $2 \text{ E.N.} - \text{I.P.} - \text{E.A.} = 0$ (D) $\text{E.N.} - \text{I.P.} - \text{E.A.} = 0$
2. The correct order of electron affinity for the different families is
 (A) Halogen > carbon > nitrogen > oxygen (B) Halogen > oxygen > nitrogen > carbon
 (C) Halogen > nitrogen > carbon > oxygen (D) Halogen > oxygen > carbon > nitrogen
3. $A_0/2$ atoms of X (g) are converted into X^+ (g) by energy E_1 . $A_0/2$ atoms of X (g) are converted into $X^-(g)$ by energy E_2 . Hence ionisation potential and electron affinity of X (g) are :
 (A) $\frac{2E_1}{A_0}, \frac{2(E_1 - E_2)}{A_0}$ (B) $\frac{2E_1}{A_0}, \frac{2E_2}{A_0}$ (C) $\frac{(E_1 - E_2)}{A_0}, \frac{2E_2}{A_0}$ (D) None
4. First, second and third I.P. values are 100 eV, 150 eV and 1500 eV. Element can be :
 (A) Be (B) B (C) F (D) Na
5. State **True or False** with explanation for the following questions
 (a) E.A. of $M^+(g)$ ion and I.E. of M(g) atom are equal.
 (b) EA_1 of sulphur is more than EA_1 of oxygen.
 (c) I.E. of Pb is more than Sn even though Pb is larger atom than Sn.
6. (a) Which has greater IE_1 ? Na^+ or Ne. Explain
 (b) Which has greater IE_2 ? O or N. Explain
 (c) Which has greater IE_2 ? Li or Be. Explain
7. Three atoms have the following E.C.
 (i) $A = 1s^2 2s^2 2p^6 3s^2 3p^1$
 (ii) $B = 1s^2 2s^2 2p^6 3s^2 3p^5$
 (iii) $C = 1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$
 (a) which of the three has largest IE_1
 (b) Which has smallest IE_4
 (c) Stability of A^{+3} , B^{+2} , C^{+3} .
8. Solutions of equal strength of XOH & QOH are prepared. If the E.N. of X & Q are respectively 0.9 & 3.2 then comment on their acidic / basic nature of then solution. Why?

9. Which is not correct order of EN :
 (A) $\text{Cl} > \text{S} > \text{P} > \text{Si}$ (B) $\text{Si} > \text{Al} > \text{Mg} > \text{Na}$ (C) $\text{F} > \text{Cl} > \text{Br} > \text{I}$ (D) None of these
10. Which of the following statements is not correct :
 (A) The elements like F, Cl, Br, O etc having high values of electron affinity act as strong oxidising agent.
 (B) The elements having low values of ionisation energies act as strong reducing agent
 (C) The formation of $\text{S}^{2-}(\text{g})$ is an exothermic process
 (D) All of these
11. The five successive ionisation energies of an element 'X' are 800, 1427, 2658, 25024 and 32824 KJ mole^{-1} respectively. The valency of 'X' is :
 (A) 3 (B) 4 (C) 1 (D) 2

DPP No. # 22

1. Which of the following process is associated with best possibility of the energy release.
 (A) $\text{Li} \longrightarrow \text{Li}^+ + \text{e}^-$ (B) $\text{O}^- + \text{e}^- \longrightarrow \text{O}^{2-}$ (C) $\text{Cl}^+ + \text{e}^- \longrightarrow \text{Cl}$ (D) $\text{Be} + \text{e}^- \longrightarrow \text{Be}^-$
2. **Statement-1:** Nitrogen atom has higher ionization energy than fluorine atom.
Statement-2: Nitrogen atom has extra stable electronic configuration due to half filled p-subshell.
 (A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
 (B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
 (C) Statement-1 is true, statement-2 is false.
 (D) Statement-1 is false, statement-2 is true.
3. Which of the following statement is not correct:
 (A) Ionic mobility of $\text{Na}^+(\text{aq})$ is greater than $\text{Mg}^{2+}(\text{aq})$
 (B) The E.A. of 'F' atom is more than 'Cl' atom
 (C) Second I.P. of 'B' atom is greater than that of 'C' atom
 (D) I.E. of O^- is less than that of 'O' atom.
4. Which of the following species of Mn has lowest electronegativity?
 (A) Mn(II) (B) Mn(IV) (C) Mn(VI) (D) Mn(VII)
5. The E.N. of H, X, O are 2.1, 0.8 and 3.5 respectively comment on the nature of the compound $\text{H}-\text{O}-\text{X}$, that is :
 (A) Basic (B) Acidic (C) Amphoteric (D) Can't be predicted
6. If $\text{X}-\text{Y}-\text{Z}$ is a compound and X, Y, Z are of comparable size & electronegativity of $\text{X} = 3.0$, $\text{Y} = 3.5$, $\text{Z} = 0.8$ then the bond which will break first in gas phase.
 (A) $\text{X}-\text{Y}$ (B) $\text{Y}-\text{Z}$
 (C) both simultaneously (D) Can't be predicted.
7. Which one is the correct order of the size of the iodine species :
 (A) $\text{I} > \text{I}^+ > \text{I}^-$ (B) $\text{I} > \text{I}^- > \text{I}^+$ (C) $\text{I}^+ > \text{I}^- > \text{I}$ (D) $\text{I}^- > \text{I} > \text{I}^+$
8. The order of magnitude of ionic radii of ions Na^+ , Mg^{2+} , Al^{3+} and Si^{4+} is :
 (A) $\text{Na}^+ < \text{Mg}^{2+} < \text{Al}^{3+} < \text{Si}^{4+}$ (B) $\text{Mg}^{2+} > \text{Na}^+ > \text{Al}^{3+} > \text{Si}^{4+}$
 (C) $\text{Al}^{3+} > \text{Na}^+ > \text{Si}^{4+} < \text{Mg}^{2+}$ (D) $\text{Na}^+ > \text{Mg}^{2+} > \text{Al}^{3+} > \text{Si}^{4+}$

9. The first ionization potential of Na, Mg, Al and Si are in the order :
 (A) $\text{Na} < \text{Mg} > \text{Al} < \text{Si}$ (B) $\text{Na} > \text{Mg} > \text{Al} > \text{Si}$ (C) $\text{Na} < \text{Mg} < \text{Al} > \text{Si}$ (D) $\text{Na} > \text{Mg} > \text{Al} < \text{Si}$
10. The correct order of second ionization potential of carbon, nitrogen, oxygen and fluorine is :
 (A) $\text{C} > \text{N} > \text{O} > \text{F}$ (B) $\text{O} > \text{N} > \text{F} > \text{C}$ (C) $\text{O} > \text{F} > \text{N} > \text{C}$ (D) $\text{F} > \text{O} > \text{N} > \text{C}$

Comprehension :

Read the following comprehension carefully and answer the questions (1 to 3).

The amount of energy released when an electron is added to an isolated gaseous atom to produce a monovalent anion is called electron affinity or first electron affinity or electron gain enthalpy. The first electron affinity is given a negative sign as the addition of an electron to a neutral atom atom. Atom is an exoergic process. The addition of electron to A^- requires energy to overcome the force of repulsion. Thus, the second electron affinity is an endoergic process. The magnitude of electron affinity depends on a number of factors such as (i) atomic size (ii) effective nuclear charge (iii) screening effects (iv) half filled and fully filled orbitals and (v) shape of orbital.

In general, electron affinity increases as the atomic radii decreases in a period. However, there are exceptions, when the atoms have stable configuration. In a group, electron affinity decreases as the size increases. However, the members of 3rd period have some what higher values than the members in the 2nd period of the same subgroups.

11. Which one of the following arrangements represent the correct order of electron gain enthalpy (magnitude) of the given atomic species :
 (A) $\text{F} < \text{Cl} < \text{O} < \text{S}$ (B) $\text{S} < \text{O} < \text{Cl} < \text{F}$ (C) $\text{O} < \text{S} < \text{F} < \text{Cl}$ (D) $\text{Cl} < \text{F} < \text{S} < \text{O}$
12. Which of the following gaseous species release maximum energy upon gain of an electron :
 (A) F^- (B) O^- (C) Na^+ (D) O
13. Which of the following processes is endoergic in nature :
 (A) $\text{O}^- + \text{e}^- \longrightarrow \text{O}^{2-}$ (B) $\text{Cl} + \text{e}^- \longrightarrow \text{Cl}^-$ (C) $\text{S} + \text{e}^- \longrightarrow \text{S}^-$ (D) $\text{F} + \text{e}^- \longrightarrow \text{F}^-$

ANSWER KEY

DPP No. # 21

1. (C) 2. (D) 3. (B) 4. (A)
5. (a) True, (b) True, (c) True Becoz. 6f electron in Pb shield nuclear charge less effectively than 5d in Sn electron
6. (a) Na^+ , (b) O , (c) Li 7. (a) ii, (b) ii, (c) $\text{A}^{+3} > \text{B}^{+2} > \text{C}^{+3}$ 8. XOH is basic & QOH is acidic
9. (D) 10. (C) 11. (A)

DPP No. # 22

1. (C) 2. (D) 3. (B) 4. (A) 5. (A) 6. (A) 7. (D)
8. (D) 9. (A) 10. (C) 11. (C) 12. (C) 13. (A)

* Marked Questions are having more than one correct option.

DPP No. # 23

1. Ionization potential phosphorus is greater than that of sulphur because –
 (A) of its smaller size (B) of more penetrating power of p-orbitals
 (C) its nuclear force of attraction on electrons (D) half-filled orbitals are more stable
2. Most metallic elements –
 (A) will have least ionization potential (B) will form most highly charged cation
 (C) will display strongest metallic bonding (D) will have zero electronegativity
3. The correct sequence of electron affinity of C, N, O and F is :
 (A) $C > N < O < F$ (B) $C > N < O > F$ (C) $C < N > O < F$ (D) $C > N > O > F$
4. The compound $X - O - H$ is likely to act as a base, if compared to hydrogen, X has –
 (A) higher ionization potential (B) lower ionization potential
 (C) higher electronegativity (D) lower radius
5. Which of the following has the highest electron affinity ?
 (A) C (B) N (C) Si (D) P
6. The electron affinity of nitrogen is lower than that of carbon because –
 (A) atomic radius of nitrogen is lower than that of carbon
 (B) effective nuclear charge in carbon is greater
 (C) addition of an electron in N gives $2p^4$ configuration
 (D) nitrogen is gaseous element
7. The second ionization potential of sodium is much more than the second ionization potential of magnesium because –
 (A) Sodium atom acquires a stable electronic configuration by losing one electron
 (B) Magnesium atom does not acquire a stable electronic configuration by losing one electron
 (C) It is very difficult to remove electron from a stable electronic structure
 (D) Of all the above facts
8. Match list I with list II and then select the correct answer from the codes given below the lists

List I A. Metalloid B. Radioactive C. Transition D. Chalcogen Codes :	List II a. Selenium b. Silver c. Arsenic d. Uranium
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Codes : A B C D (A) a b c d (C) d b c a	A B C D (B) c d b a (D) b c d a
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9. Match list I with list II and then select the correct answer from the codes given below the lists
- | List I | | | | List II | | | |
|--------|--------------------------|----|--|---------|--|--|--|
| A. | Isoelectronic | a. | $A^+ + \text{energy} \rightarrow A^{++}$ | | | | |
| B. | Half filled orbital | b. | Ar, K^+ , Ca^{++} | | | | |
| C. | Second ionisation energy | c. | Cerium | | | | |
| D. | Lanthenide | d. | Arsenic | | | | |
- Codes :
- | | A | B | C | D | | A | B | C | D |
|-----|---|---|---|---|-----|---|---|---|---|
| (A) | c | b | d | a | (B) | b | c | a | d |
| (C) | d | c | a | b | (D) | b | d | a | c |
10. The most polar bond is –
 (A) Br – H (B) Cl – H (C) O – H (D) N – H
11. Covalent oxide is –
 (A) CaO (B) SrO (C) MgO (D) BeO
12. In which process energy will be released –
 (A) $A(g) \rightarrow A^+(g) + e$ (B) $\frac{1}{2} A_2(g) \rightarrow A(g)$
 (C) $A(s) \rightarrow A(g)$ (D) $A^+(g) + B^-(g) \rightarrow A^+B^-(s)$
13. The electronegativity of the following elements increases in the order –
 (A) C, N, Si, P (B) N, Si, C, P (C) Si, P, C, N (D) P, Si, N, C
14. Van-der waals forces exist in –
 (A) inert gases (B) rare gases (C) gaseous mixture (D) elementary gas

DPP No. # 24

1. Exothermic process is –
 (A) $Na \rightarrow Na^+ + e$ (B) $O + e \rightarrow O^-$ (C) $O^- + e \rightarrow O^{2-}$ (D) $Cl^- \rightarrow Cl + e$
2. Which of the following has the least acidic –
 (A) HF (B) HCl (C) HBr (D) HI
3. Two p-block elements x (outer configuration ns^2, np^3) and z (outer configuration ns^2np^4) occupy neighbouring positions in a period. Using this information which of the following is correct with respect to their ionization potential I_x and I_z .
 (A) $I_x > I_z$ (B) $I_z > I_x$
 (C) $I_z = I_x$ (D) relation between I_x and I_z is uncertain
4. The second I.P. of Na, third I.P. of Mg and fourth I.P. of Al are very high because
 (A) the ion Na^+ , Mg^{2+} and Al^{3+} have high ionic potential
 (B) these ions are isoelectronic
 (C) these ions have outer ns^2np^6 configuration
 (D) these ions are of normal elements
5. Which of the following statements is correct for the addition of an electron to an isolated and gaseous uninegatively charged oxygen (O^-) ion ?
 (A) the addition of electron cannot occur
 (B) the addition of electron occurs with evolution of energy
 (C) the addition of electron occurs with absorption of energy
 (D) the heat of reaction is zero
6. Be and Mg have zero value of electron affinities, because –
 (A) Be and Mg have (He) $2s^2$ and (Ne) $3s^2$ configuration respectively
 (B) 2s and 3s orbitals are filled to their capacity
 (C) Be and Mg are unable to accept electron
 (D) all the above are correct

7. For I.P. which order is wrong –
 (a) $F > O$ (b) $O > N$ (c) $S > P$ (d) $Be > B$
 Code is –
 (A) a, b, c (B) b, c, d (C) a, d (D) a, b, d
8. Alkali metals do not form dipositive ions, because –
 (A) The difference in the first and second I.P. is more than 16 eV
 (B) The difference in the first and second I.P. is less than 11 eV
 (B) Alkali metals have one electron in their ultimate energy level
 (D) Oxidation state of alkali metal is +1
9. Match List I with List II and select the correct answer from the codes given below the lists
- | List I | | | | List II | | | |
|--------|------------------------------|----|------------|---------|--|--|--|
| A. | Highest ionization potential | a. | Technitium | | | | |
| B. | Highest electronegativity | b. | Lithium | | | | |
| C. | Artificial element | c. | Helium | | | | |
| D. | High reducing ability | d. | Fluorine | | | | |
- Codes :
- | | A | B | C | D | | A | B | C | D |
|-----|---|---|---|---|-----|---|---|---|---|
| (A) | c | d | a | b | (B) | c | d | b | a |
| (C) | c | b | d | a | (D) | a | d | b | c |
10. The correct order of relative basic character of $NaOH$, $Mg(OH)_2$ and $Al(OH)_3$ is –
 (A) $Al(OH)_3 > Mg(OH)_2 > NaOH$ (B) $Mg(OH)_2 > NaOH > Al(OH)_3$
 (C) $NaOH > Mg(OH)_2 > Al(OH)_3$ (D) $Al(OH)_3 > NaOH < Mg(OH)_2$
11. Match List I with List II and select the correct answer from the codes given below the lists
- | List I | | | | List II | | | |
|--------|-------------------------------------|----|----------------|---------|--|--|--|
| A. | Increasing atomic size | a. | $Cl < O < F$ | | | | |
| B. | Decreasing atomic radius | b. | $Li < Be < B$ | | | | |
| C. | Increasing electronegativity | c. | $Si < Al < Mg$ | | | | |
| D. | Decreasing effective nuclear charge | d. | $N > O > F$ | | | | |
- Codes :
- | | A | B | C | D | | A | B | C | D |
|-----|---|---|---|---|-----|---|---|---|---|
| (A) | c | d | a | b | (B) | d | b | c | a |
| (C) | a | b | c | d | (D) | b | a | d | c |
12. Which of the following represents incorrect relation of O :
 (A) $C > O > N$ (B) $C < O > N$ (C) $O > C < N$ (D) $O > N > C$
13. The electron affinity of the halogens follows the order :
 (A) $F < Cl < Br < I$ (B) $F > Cl < Br < I$ (C) $F < Cl > Br > I$ (D) $F > Cl > Br > I$
14. The process of requiring absorption of energy is :
 (A) $F \rightarrow F^-$ (B) $Cl \rightarrow Cl^-$ (C) $O^- \rightarrow O^{-2}$ (D) $H \rightarrow H^-$

ANSWER KEY

DPP No. # 23

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|----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. | (D) | 2. | (A) | 3. | (A) | 4. | (B) | 5. | (D) | 6. | (B) | 7. | (D) |
| 8. | (B) | 9. | (D) | 10. | (D) | 11. | (D) | 12. | (D) | 13. | (C) | 14. | (A) |

DPP No. # 24

- | | | | | | | | | | | | | | |
|----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. | (B) | 2. | (A) | 3. | (A) | 4. | (C) | 5. | (C) | 6. | (D) | 7. | (B) |
| 8. | (A) | 9. | (A) | 10. | (C) | 11. | (D) | 12. | (D) | 13. | (C) | 14. | (C) |