DPP - Daily Practice Problems

Chapter-wise Sheets

Date : | Start Time : | End Time :

CHEMISTRY CC03

SYLLABUS : Classification of Elements and Periodicity in Properties

Max. Marks : 120 **Marking Scheme :** + 4 for correct & (–1) for incorrect **Time : 60 min.**

INSTRUCTIONS : This Daily Practice Problem Sheet contains 30 MCQ's. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.

1. The correct sequence which shows decreasing order of the ionic radii of the elements is

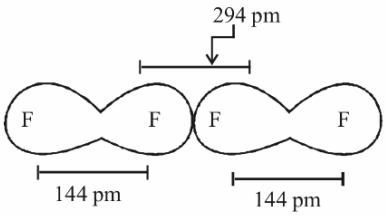
(a) $Al^{3+} > Mg^{2+} > Na^{+} > F^{-} > O^{2-}$

(b) $Na^{+} > Mg^{2+} > Al^{3+} > O^{2-} > F^{-}$

(c) $Na^{+} > F^{-} > Mg^{2+} > O^{2-} > Al^{3+}$

(d) $O^{2-} > F^{-} > Na^{+} > Mg^{2+} > Al^{3+}$

2. The van der Waal and covalent radii of fluorine atom respectively from the following figure are.



(a) 219pm, 72pm (b) 75pm, 72pm

(c) 147pm, 72pm (d) 147pm, 144pm

3. Arrange the following in increasing order of ionic radii?
$C^{4-}, N^{3-}, F^{-}, O^{2-}$

(a) $C^{4-} < N^{3-} < O^{2-} < F^{-}$

(b) $N^{3-} < C^{4-} < O^{2-} < F^{-}$

(c) $F^{-} < O^{2-} < N^{3-} < C^{4-}$

(d) $O^{2-} < F^{-} < N^{3-} < C^{4-}$

4. Which is not the correct order for the stated property.

(a) Ba > Sr > Mg ; atomic radius

(b) F > O > N ; first ionization enthalpy

(c) Cl > F > I ; electron affinity

(d) O > Se > Te ; electronegativity

RESPONSE GRID	1. ⓐⓑⓒⓓ	2. ⓐⓑⓒⓓ	3. ⓐⓑⓒⓓ	4. ⓐⓑⓒⓓ

Space for Rough Work

5. In which of the following arrangements, the order is NOT according to the property indicated against it?
(a) Li < Na < K < Rb :
Increasing metallic radius
(b) I < Br < F < Cl :
Increasing electron gain enthalpy
(with negative sign)
(c) B < C < N < O
Increasing first ionization enthalpy
(d) $Al^{3+} < Mg^{2+} < Na^{+} < F^{-}$
Increasing ionic size

6. The symbol and IUPAC name for the element with atomic number 120, respectively are
(a) Ubn and unbinilium
(b) Ubn and unbiunium
(c) Ubn and unnibium
(d) Ubn and unnilium

7. Sequence of acidic character is
(a) $N_2O_5 > SO_2 > CO > CO_2$
(b) $N_2O_5 > SO_2 > CO_2 > CO$
(c) $SO_2 > CO_2 > CO > N_2O_5$
(d) $SO_2 > N_2O_5 > CO > CO_2$

8. The correct order of ionization energy for carbon, nitrogen and oxygen atoms is:
(a) C > N > O (b) C > N < O
(c) C < N > O (d) C < N < O

9. Which of the following order is wrong?
(a) $NH_3 < PH_3 < AsH_3$ – Acidic
(b) Li < Be < B < C – First IP
(c) $Al_2O_3 < MgO < Na_2O < K_2O$ – Basic
(d) $Li^+ < Na^+ < K^+ < Cs^+$ – Ionic radius

10. The radii of F, F^-, O and O^{2-} are in the order
(a) $O^{2-} > F^- > F > O$
(b) $F^- > O^{2-} > F > O$
(c) $O^{2-} > O > F^- > F$
(d) $O^{2-} > F^- > O > F$

11. Which of the following has the maximum number of unpaired electrons?
(a) Mg^{2+}
(b) Ti^{3+}
(c) V^{3+}
(d) Fe^{2+}

12. The incorrect statement among the following is
(a) The first ionization potential of Al is less than the first ionization potential of Mg
(b) The second ionization potential of Mg is greater than the second ionization potential of Na
(c) The first ionization potential of Na is less than the first ionization potential of Mg
(d) The third ionization potential of Mg is greater than the third ionization potential of Al.

13. According to the Periodic Law of elements, the variation in properties of elements is related to their
(a) nuclear masses
(b) atomic numbers
(c) nuclear neutron-proton number ratios
(d) atomic masses

14. Identify the correct order of the size of the following:
(a) $Ca^{2+} < K^+ < Ar < Cl^- < S^{2-}$
(b) $Ar < Ca^{2+} < K^+ < Cl^- < S^{2-}$
(c) $Ca^{2+} < Ar < K^+ < Cl^- < S^{2-}$
(d) $Ca^{2+} < K^+ < Ar < S^{2-} < Cl^-$

RESPONSE GRID					
	5. (a)(b)(c)(d)	**6.** (a)(b)(c)(d)	**7.** (a)(b)(c)(d)	**8.** (a)(b)(c)(d)	**9.** (a)(b)(c)(d)
	10. (a)(b)(c)(d)	**11.** (a)(b)(c)(d)	**12.** (a)(b)(c)(d)	**13.** (a)(b)(c)(d)	**14.** (a)(b)(c)(d)

Space for Rough Work

15. Following statements regarding the periodic trends of chemical reactivity of the alkali metals and the halogens are given. Which of these statements gives the correct picture?
(a) Chemical reactivity increases with increase in atomic number down the group in both the alkali metals and halogens
(b) In alkali metals the reactivity increases but in the halogens it decreases with increase in atomic number down the group
(c) The reactivity decreases in the alkali metals but increases in the halogens with increase in atomic number down the group
(d) In both the alkali metals and the halogens the chemical reactivity decreases with increase in atomic number down the group

16. In which of the following arrangements, the sequence is *not* strictly according to the property written against it?
(a) $HF < HCl < HBr, HI$: increasing acid strength
(b) $NH_3 < PH_3 < AsH_3 < SbH_3$: increasing basic strength
(c) $B < C < O < N$: increasing first ionization enthalpy
(d) $CO_2 < SiO_2 < SnO_2 < PbO_2$: increasing oxidising power

17. Which of the following order is wrong?
(a) $NH_3 < PH_3 < AsH_3$ — Acidic
(b) $Li < Be < B < C$ — IE_1
(c) $Al_2O_3 < MgO < Na_2O < K_2O$ — Basic
(d) $Li^+ < Na^+ < K^+ < Cs^+$ — Ionic radius

18. 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) F > Cl > Br > I (b) Cl > F > Br > I
(c) Br > Cl > I > F (d) I > Br > Cl > F

19. Which one of the following has largest ionic radius?
(a) Li^+ (b) O_2^{2-}
(c) B^{3+} (d) F^-

20. 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

21. Which of the following elements represents highly electropositive as well as highly electronegative character in its period?
(a) Hydrogen (b) Nitrogen
(c) Fluorine (d) None of these

22. Which one of the following ions has the highest value of ionic radius ?
(a) O^{2-} (b) B^{3+}
(c) Li^+ (d) F^-

23. Among Al_2O_3, SiO_2, P_2O_3 and SO_2 the correct order of acid strength is
(a) $Al_2O_3 < SiO_2 < SO_2 < P_2O_3$
(b) $SiO_2 < SO_2 < Al_2O_3 < P_2O_3$
(c) $SO_2 < P_2O_3 < SiO_2 < Al_2O_3$
(d) $Al_2O_3 < SiO_2 < P_2O_3 < SO_2$

24. Which of the following arrangements represents the increasing order (smallest to largest) of ionic radii of the given species O^{2-}, S^{2-}, N^{3-}, P^{3-}?
(a) $O^{2-} < N^{3-} < S^{2-} < P^{3-}$ (b) $O^{2-} < P^{3-} < N^{3-} < S^{2-}$
(c) $N^3 < O^{2-} < P^{3-} < S^{2-}$ (d) $N^{3-} < S^{2-} < O^{2-} < P^{3-}$

RESPONSE GRID					
	15. ⓐⓑⓒⓓ	**16.** ⓐⓑⓒⓓ	**17.** ⓐⓑⓒⓓ	**18.** ⓐⓑⓒⓓ	**19.** ⓐⓑⓒⓓ
	20. ⓐⓑⓒⓓ	**21.** ⓐⓑⓒⓓ	**22.** ⓐⓑⓒⓓ	**23.** ⓐⓑⓒⓓ	**24.** ⓐⓑⓒⓓ

Space for Rough Work

25. Which of the following oxides is amphoteric in character?
(a) SnO_2 (b) SiO_2
(c) CO_2 (d) CaO

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

$O(g) + e^- \rightarrow O^-(g)$; $\Delta_f H^\ominus = -141$ kJ mol^{-1}

$O^-(g) + e^- \rightarrow O^{2-}(g)$; $\Delta_f H^\ominus = +780$ kJ mol^{-1}

Thus process of formation of O^{2-} in gas phase is unfavourable even though O^{2-} is isoelectronic with neon. It is due to the fact that
(a) Electron repulsion outweighs the stability gained by achieving noble gas configuration
(b) O^- ion has comparatively smaller size than oxygen atom
(c) Oxygen is more electronegative
(d) Addition of electron in oxygen results in larger size of the ion.

27. Which of the following statements is wrong ?
(a) van der Waal's radius of iodine is more than its covalent radius
(b) All isoelectronic ions belong to same period of the periodic table
(c) I.E.$_1$ of N is higher than that of O while I.E.$_2$ of O is higher than that of N
(d) The electron gain enthalpy of N is almost zero while that of P is 74.3 kJ mol^{-1}

28. The first ($\Delta_i H_1$) and second ($\Delta_i H_2$) ionization enthalpies (in kJ mol^{-1}) and the electron gain enthalpy ($\Delta_{eg} H$) (in kJ mol^{-1}) of the elements I, II, III, IV and V are given below

Element	$\Delta_i H_1$	$\Delta_i H_2$	$\Delta_{eg} H$
I	520	7300	–60
II	419	3051	–48
III	1681	3374	–328
IV	1008	1846	–295
V	2372	5251	+48

The most reactive metal and the least reactive non-metal of these are respectively
(a) I and V (b) V and II
(c) II and V (d) IV and V

29. Consider the following statements:
(i) Atomic radii decreases across a row of the periodic table when we move from left to right.
(ii) Atomic radii increases down the column as we move from top to bottom.
(iii) Although the order of elements is based on atomic numbers, vertical families share similar chemical properties.
Which of the statement(s) given above is/are correct?
(a) (i) and (ii) (b) (i) and (iii)
(c) (ii) and (iii) (d) (i), (ii) and (iii)

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

Columnn-I (Atoms)	Column-II (Properties)
(A) He	(p) High electronegative
(B) F	(q) Most electropositive
(C) Rb	(r) Strongest reducing agent
(D) Li	(s) Highest ionisation energy

(a) A – (s), B – (q), C – (r), D – (p)
(b) A – (p), B – (s), C – (q), D – (r)
(c) A – (s), B – (p), C – (r), D – (q)
(d) A – (s), B – (p), C – (q), D – (r)

RESPONSE GRID	25. ⓐⓑⓒⓓ 26. ⓐⓑⓒⓓ 27. ⓐⓑⓒⓓ 28. ⓐⓑⓒⓓ 29. ⓐⓑⓒⓓ 30. ⓐⓑⓒⓓ

DAILY PRACTICE PROBLEM DPP CHAPTERWISE 3 - CHEMISTRY			
Total Questions	30	Total Marks	120
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	38	Qualifying Score	55
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

Space for Rough Work