INORGANIC CHEMISTRY

DPP
DAILY PRACTICE PROBLEMS

DPP No. 4

Total Marks : 26

Max. Time : 27 min.

Topic : Periodic Table and Periodicity

Type of Questions		M.M., Min.
Single choice Objective ('–1' negative marking) Q.1 to Q.6	(3 marks, 3 min.)	[18, 18]
Multiple choice objective ('–1' negative marking) Q.7	(4 marks, 4 min.)	[4, 4]
Subjective Questions ('–1' negative marking) Q.8	(4 marks, 5 min.)	[4, 5]

1. An element with atomic number 107 has recently been discovered. Its block, group number, period and outershell electronic configuration respectively are :

(A) s-block, group 2, period 6, $6s^2$ (B) p-block, group 13, period 5, $5s^2\ 5p^4$

(C) d-block, group 7, period 7, $7s^2$ (D) f-block, group 3, period 6, $6s^2$

2. What is atomic number of Ununhexium ?

(A) 106 (B) 96 (C) 116 (D) 118

3. 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) O < S < F < Cl (B) F < S < O < Cl

(C) S < O < Cl < F (D) Cl < F < O < S

4. The electronegativity of H and Cl are 2.1 and 3.0 respectively. The correct statement about the nature of HCl is: (A) 17% ionic (B) 83% ionic

(C) 50% ionic (D) 100% ionic

5. Among the following oxides, the least acidic is :

(A) P_4O_6 (B) P_4O_{10}

(C) As_4O_6 (D) As_4O_{10}

6. The correct order of acidic strength is :

(A) $Cl_2O_7 > SO_3 > P_4O_{10}$ (B) $CO_2 > N_2O_5 > SO_3$

(C) $Na_2O > MgO > Al_2O_3$ (D) $K_2O > CaO > MgO$

7.* Which one of the following statements are 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 $S^{2-}(g)$ is an exothermic process.

(D) If an element A having EN = 7 on Mulliken scale makes an oxide, then its nature will be acidic.

8. How does EN difference between bonded atoms affect the % ionic character of the bond and the bond length? Compare the bond lengths of N–O and C–O bonds using EN values.

(Given $r_N \Rightarrow 0.75$ Å; $r_0 \Rightarrow 0.74$ Å; $r_c \Rightarrow 0.77$Å)

Answer Key

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1.	(C)	**2.**	(C)	**3.**	(A)	**4.**	(A)	**5.**	(C)
6.	(A)	**7.***	(A,B,D)	**8.**	$d_{C-O} < d_{N-O}$				

Hints & Solutions

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4. % ionic character = $16(X_A - X_B) + 3.5\,(X_A - X_B)^2$

$= 17.235 \quad = 17\%$

5. Down the group non-metalic character decreases & by increase of oxidation number acidic charaeter of oxide increases.

6. As non-metallic character of element attached to oxygen atom increases, the difference between the electronegativity values of element and oxygen decreases and the acid character of oxides increases and vice-versa.

8. As bond polarity ↑, % ionic character ↑ , % ionic character = $16(X_A - X_B) + 3.5\,(X_A - X_B)^2$

As bond polarity ↑, Bond Length ↓, $d = r_A + r_B - 0.09\,(X_A - X_B)$

$d_{N-O} \simeq 1.445$ Å

$d_{C-O} \simeq 1.42$ Å

As polarity ↑ B. Str. ↑ B. Length ↓

$\therefore \quad d_{C-O} < d_{N-O}$