



INDIAN SCHOOL DARSAIT  
DEPARTMENT OF CHEMISTRY



<b>Subject: Chemistry    Topic: CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES</b>		
<b>Resource Person: Jyothy Sukhadiya</b>		<b>Date : 14.8.17</b>
<b>Name of Student: _____</b>	<b>Class &amp; Division: XI :</b>	<b>Roll No:</b>
1.	State modern periodic law.	1
2.	Define: (a) Covalent radius (b) Metallic radius (c) Ionisation enthalpy (d) Electron gain enthalpy (e) Electronegativity	1 Each
3.	Consider the following species : $N^{3-}$ , $O^{2-}$ , $F^-$ , $Na^+$ , $Mg^{2+}$ and $Al^{3+}$ (a) What is common in them? (b) Arrange them in the order of increasing ionic radii.	2
4.	Write the IUPAC names and symbols for the elements having atomic numbers 108, 112, 114 and 116.	1 each
5.	The outer electronic configurations of some elements are- (a) $3s^2 3p^4$ (b) $3d^{10} 4s^2$ (c) $3s^2 3p^6 4s^2$ and (d) $6s^2 4f^3(e) (n-1)d^1 ns^2$ where $n=4$ (f) $(n-1) d^2 ns^2$ where $n=5$ . Predict the period and block of these elements in the periodic table.	1 Each
6.	Elements A and B have atomic numbers 12 and 19 respectively. Predict their block, period and group to which they belong?	2
7.	How does atomic radius vary in a period and in a group? Explain.	2
8.	Explain the variation of ionisation enthalpy in a period and in a group.	2
9.	Cations are smaller and anions are larger in radii than their parent atom. Justify.	2
10.	Give reasons : (a) Be has higher ionisation enthalpy than Boron. (b) Oxygen has lower ionisation enthalpy than N and F.	2
11.	Write the general electronic configuration of s, p, d and f block elements.	2
12.	Give characteristic properties of s, p, d and f block elements.	2 each
13.	Explain the variation of electron gain enthalpy along a period and down a group.	2
14.	What do you mean by diagonal relationship? Also write three examples of diagonal pairs.	2

15.	Classify the following oxides as neutral, acidic, basic and amphoteric. $\text{Al}_2\text{O}_3$ , $\text{CO}_2$ , $\text{SiO}_2$ , $\text{CO}$	2																				
16.	Account for the following. (a) Electron gain enthalpy of F is less negative than that of Cl. (b) Electron gain enthalpy of O is less negative than that of S. (c) First ionization enthalpy of Na is lower than that of Mg where as its second ionization enthalpy is higher than that of Mg. (d) Atomic size of gallium is smaller than that of aluminium. (e) Second ionization enthalpy will be higher than the first ionization enthalpy. (f) Halogens have very high negative electron gain enthalpies. (g) Noble gases have large positive electron gain enthalpies.	3																				
17	If A = $1s^2, 2s^2, 2p^1$ B = $1s^2, 2s^2, 2p^6, 3s^2, 3p^1$ C = $1s^2, 2s^2, 2p^6, 3s^2, 3p^3$ D = $1s^2, 2s^2, 2p^6, 3s^2, 3p^5$ E = $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^2$ F = $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^2, 3d^1$ a) Which two elements are in the same group? b) Which has the highest negative value for electron gain enthalpy? c) Which element belongs to the 13th group? d) Which is the most metallic element? e) Which is a halogen? f) Which one belongs to the d-block?	3																				
18	The first & second ionization enthalpies & electron gain enthalpies of elements (in KJ/mol) I, II, III, & IV are as follows: <table border="1" data-bbox="172 1048 1299 1245"> <thead> <tr> <th>Element</th> <th><math>\Delta_i H_1</math></th> <th><math>\Delta_i H_2</math></th> <th><math>\Delta_{eg} H</math></th> </tr> </thead> <tbody> <tr> <td>I</td> <td>520</td> <td>7200</td> <td>-60</td> </tr> <tr> <td>II</td> <td>1681</td> <td>3374</td> <td>-328</td> </tr> <tr> <td>III</td> <td>2372</td> <td>5251</td> <td>+48</td> </tr> <tr> <td>IV</td> <td>419</td> <td>3051</td> <td>-48</td> </tr> </tbody> </table> Which of the above elements is likely to be : (a) the least reactive element. (b) the most reactive metal. (c) the most reactive non-metal. (d) the metal which can form a predominantly stable covalent halide of the formula MX (X=halogen)?	Element	$\Delta_i H_1$	$\Delta_i H_2$	$\Delta_{eg} H$	I	520	7200	-60	II	1681	3374	-328	III	2372	5251	+48	IV	419	3051	-48	2
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19	Show by a chemical reaction with water that $\text{Na}_2\text{O}$ is a basic oxide and $\text{Cl}_2\text{O}_7$ is an acidic oxide.	2																				
20	Are the oxidation state and covalency of Al in $[\text{AlCl}(\text{H}_2\text{O})_5]^{2+}$ same ?	1																				
21	What are the reasons for the anomalous behavior of the first member of a group of elements in the s- and p-blocks compared to that of the subsequent members in the same group?	2																				