	INDIAN SCHOOL AL WADI AL KABIR	
Class: XI	**DEPARTMENT: SCIENCE 2021-22** **SUBJECT: CHEMISTRY**	**Date of completion:** **30.08.2021**
Worksheet No:03 **with answers**	**TOPIC: CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES**	**Note:** **A4 FILE FORMAT**
NAME OF THE STUDENT	**CLASS & SEC:**	**ROLL NO.**

MULTIPLE CHOICE QUESTIONS

1. The element with atomic number 35 belongs to
   a. d – Block
   b. f – Block
   c. p – Block
   d. s – Block

2. The group number, number of valence electrons, and valency of an element with the atomic number 15, respectively, are:
   a. 16, 5 and 2
   b. 15, 5 and 3
   c. 16, 6 and 3
   d. 15, 6 and 2

3. Nomenclature of elements with atomic number 107 is

   a. Unnilseptium
   b. Unnilennium
   c. Ununseptium
   d. Unnilbium

4. Which of the following properties generally decreases along a period?
   a. Ionization Energy
   b. Metallic Character
   c. Electron Affinity
   d. Valency.

5. Group 16 elements are also called
   a. halogens
   b. noble gases
   c. Representative Elements
   d. chalcogens

6. Which among the following elements has the highest negative electron gain enthalpy?
   a. Hydrogen
   b. Fluorine
   c. Chlorine
   d. Oxygen

7. Which of the following is not a transition element?
   a. Fe
   b. Cu
   c. Zn
   d. Ni

8. The species that is isoelectronic with Na^+ is _____
   a. Ca^{2+}
   b. F^-
   c. S^{2-}
   d. K^+

9. Maximum covalency of boron is
   a. 4
   b. 6
   c. 8
   d. 2

10. Which of the following oxides is amphoteric in nature?
   a. SnO_2
   b. CO_2
   c. CaO
   d. Na_2O

Assertion Reason type

11. Assertion: Boron has a smaller first ionisation enthalpy than beryllium.
   Reason: The penetration of a 2s electron to the nucleus is more than the 2p electron hence 2p electron is more shielded by the inner core of electrons than the 2s electrons.

   a. Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
   b. Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
   c. Assertion is correct, but reason is wrong statement.
   d. Assertion is wrong, but reason is correct statement.

12. Assertion: Fluorine is more electronegative than chlorine.
   Reason: Across the period, electronegativity decreases.
   a. Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.

b. Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
c. Assertion is correct, but reason is wrong statement.
d. Assertion is wrong, but reason is correct statement.

13. Assertion: The p-Block Elements comprise those belonging to Group 13 to 18.
Reason: Last electron of elements of Group 13 to 18 enters into the *d* orbital.
a. Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
b. Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
c. Assertion is correct, but reason is wrong statement.
d. Assertion is wrong, but reason is correct statement.

1 Mark

14. Write the general outer electronic configuration of *d* block elements?
15. State modern periodic law.
16. What are transuranium Elements?

2 Marks

17. What are isoelectronic species? Give any 4 examples.
18. Define:
    i. Electronegativity
    ii. Ionization Enthalpy

3 Marks

19. Give reason for the following.
    i. The second ionization enthalpy of Na is more than that of Mg.
    ii. $[AlF_6]^{3-}$ is known but $[BF_6]^{3-}$ is not.
    iii. Electron gain enthalpy of F is less negative than that of Cl.

5 Marks

20. The first ($\Delta_i H_1$) and the second ($\Delta_i H_2$) ionization enthalpies (in kJ mol^{-1}) and the ($\Delta_{eg}H$) electron gain enthalpy (in kJ mol^{-1}) of a few elements are given below:

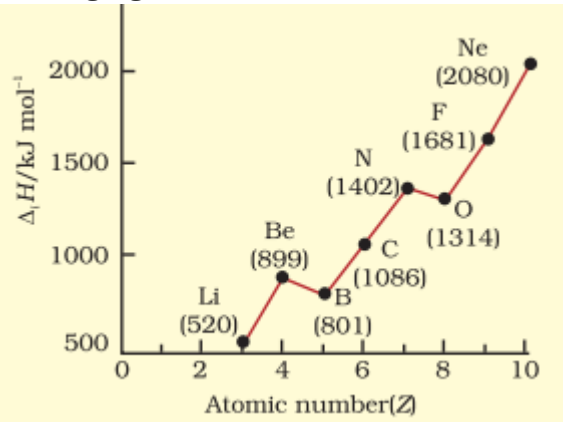
Elements	ΔH_1	ΔH_2	$\Delta_{eg}H$
I	520	7300	–60
II	419	3051	–48
III	1681	3374	–328
IV	1008	1846	–295
V	2372	5251	+48
VI	738	1451	–40

Which of the above elements is/are likely to be:

(a) the least reactive element.
(b) the more reactive group one metal.
(c) the reactive non-metals.
(d) the metal which can form a stable binary halide of the formula MX_2(X=halogen).
(e) the metal which can form a predominantly stable covalent halide of the formula MX (X=halogen)?

CASE STUDY QUESTIONS:

21. Explain the deviation in first ionisation enthalpy of some elements from the general trend by using the following figure.



ANSWERS

1. c
2. b
3. a
4. b
5. d
6. c
7. c
8. b
9. a
10. a
11. a
12. c
13. c

14. $(n-1)d^{1-10}ns^{0-2}$

15. The physical and chemical properties of the elements are periodic functions of their atomic numbers.

16. The elements after uranium are called Transuranium Elements.

17. Atoms and ions which contain the same number of electrons are called isoelectronic species.

Eg: - O^{2-}, F^-, Na^+, Mg^{2+} etc.

18. i) The ability of an atom in a chemical compound to attract shared electrons to itself is called electronegativity

ii) The energy required to remove an electron from an isolated gaseous atom in its ground state is called ionization energy.

19. i. This is because alkali metals, after losing one electron, acquires noble gas configuration, which is very stable.

ii. Due to the absence of d orbitals, maximum covalency of Boron is 4.

iii. Adding an electron to the 2p-orbital in fluorine leads to greater repulsion than adding an electron to the larger 3p-orbital in chlorine.

20. a. V
b. II
c. III and IV
d. VI
e. I

21. The first ionization enthalpy of boron (Z = 5) is slightly less than that of beryllium (Z = 4). In beryllium, the electron removed during the ionization is an s-electron whereas the electron removed during ionization of boron is a p-electron. The penetration of a 2s-electron to the nucleus is more than that of a 2p-electron; hence the 2p electron of boron is more shielded from the nucleus by the inner core of electrons than the 2s electrons of beryllium. Therefore, it is easier to remove the 2p-electron from boron compared to the removal of a 2s- electron from beryllium. Thus, boron has a smaller first ionization enthalpy than beryllium.

The first ionization enthalpy of oxygen is less compared to nitrogen. This arises because in the nitrogen atom, three 2p-electrons reside in different atomic orbitals (Hund's rule) whereas in the oxygen atom, two of the four 2p-electrons must occupy the same 2p-orbital resulting in an increased electron-electron repulsion. Consequently, it is easier to remove the fourth 2p-electron from oxygen than it is, to remove one of the three 2p-electrons from nitrogen.

Neon has the highest first ionisation enthalpy in this period because it's a noble gas which has closed electron shells and very stable electron configurations.

Prepared by: Ms. Jasmin Joseph	Checked by : HOD - SCIENCE