Girls' High School & College, Prayagraj

Worksheet No. : 2

Session : 2020-21

Class : X A, B, C, D, E, F

Subject : Chemistry

Instructions: Parents are expected to ensure that the student spends 2 days to read and understand the chapter according to the books and website referred and thereafter answer the given questions.

Note: Chapter- Periodic table, periodic properties and variations of properties

Book: Concise Chemistry by Dr. S. P. Singh (Selina Publication)

Website: Wikipedia or chem.libretexts.org

Answer the following questions:

(1) Fill in the blanks

(a) The electronegativity of iodine is _____ that of chlorine (less than/greater than).
(b) Atomic number of an element Z is 16. Z is a _____ (metal/non metal).
(c) The element with the least electronegativity is _____ (Li /C /F).
(d) Down the group, electron affinity _____ (increases/decreases/remains same).
(e) Metals are good _____. (oxidizing agent/reducing agent).

(2) Elements X, Y and Z belong to the third period of the periodic table. Their metallic character varies as Y > X > Z.

(a) The atomic number of X is _____ (more/less) than that of Y.
(b) X is likely to be more electronegative than _____ (Y / Z).

(3) Arrange the following as per the instructions given in the brackets:

(a) Cs, Na, Li, K, Rb (increasing metallic character)
(b) Cl, F, Br, I (increasing electron affinity)
(c) Cs, Na, Li, K, Rb (decreasing electronegativity)
(d) Si, Na, Al, Mg, Cl, P, S (decreasing non-metallic character)

(4) The metals of group 2 from top to bottom are Be, Mg, Ca, Sr and Ba.

(a) State the common feature in their electronic configuration.
(b) Which element has the most metallic character?
(c) Which element would be expected to have the highest electronegativity?
(d) Will the elements in the group to the right of this group be more metallic or less metallic in character?

(5) Give appropriate scientific reasons for each of the following statements:
(a) Metallic character of elements decreases from left to right in a period.
(b) The oxidizing power of elements increases on moving from left to right along a period in the periodic table.

(6) Give one word/ chemical term for the following:
(a) The amount of energy released when an electron is added to a neutral isolated gaseous atom in the ground state.
(b) The most electronegative element.
(c) Tendency of an atom to attract the shared pair of electrons.

(7) Chorine in the Periodic Table is surrounded by the elements with atomic number 9, 16, 18 and 35.
(a) Which of these have physical and chemical properties resembling chlorine?
(b) Which is more electronegative than chlorine?

(8) The electronegativities (according to Pauling) of the elements in Period 3 of the Periodic Table are as follows with elements arranged in alphabetical order:

Al	Cl	Mg	Na	P	S	Si
1.5	3.0	1.2	0.9	2.1	2.5	1.8

Arrange the elements in the order in which they occur in the periodic table from left to right. (The group 1 element first, followed by the group 2 element and so on, up to group 17)

(9) Parts (a) to (f) refer to change in the properties of elements on moving from left to right across a period of the periodic table. For each property, choose the correct answer.

(a) The non-metallic character of the elements:
(i) Decreases
(ii) Increases

(iii) Remains the same
(iv) Depends on the period

(b) The electronegativity:
(i) Depends on the number of valence electrons
(ii) Remains the same
(iii) Decreases
(iv) Increases

(c) The ionization potential:
(i) goes up and down
(ii) Decreases
(iii) Increases
(iv) Remains the same

(d) The atomic size:
(i) Decreases
(ii) Increases
(iii) Remains the same
(iv) Sometimes increases and sometimes decreases

(e) The electron affinity of the elements in groups 1 to 17:
(i) Goes up and then down
(ii) Decreases and then increases
(iii) Increases
(iv) Decreases

(f) Ionisation potential increases over a period from left to right because the
(i) Atomic radius and nuclear charge increases
(ii) Atomic radius and nuclear charge decreases
(iii) Atomic radius increases and nuclear charge decreases
(iv) Atomic radius decreases and nuclear charge increases

(10)

Group Numbers	IA 1	IIA 2	IIIA 13	IVA 14	VA 15	VIA 16	VIIA 17	0 18
	Li		D			O	J	Ne
	A	Mg	E	Si		H	K	
	B	C		F	G			L

In the above table, B does not represent Boron. Some elements are given in their own symbol and position in the periodic table while others are shown with a letter.

Select from the table:

(a) Which is the most electronegative?

(b) How many valence electrons are present in G?

(c) Write the formula of the compound between B and H.

(11) Choose the correct answer from the choices given:

(a) In the periodic table, alkali metals are placed in the group

(i) 1

(ii) 11

(iii) 17

(iv) 18

(b) Which of the following properties do not match with elements of the halogen family?

(i) They have seven electrons in their valence shell.

(ii) They are highly reactive chemically.

(iii) They are metallic in nature.

(iv) They are diatomic in their molecular form

(12)

(a) Among the Period 2 elements, the element which has high electron affinity is

(A) Lithium

(B) Carbon

(C) Chlorine

(D) Fluorine

(b)

Group No.	I-IA	2-IIA	13-IIIA	14-IVA	15-VA	16-VIA	17-VIIA	18-O
2^{nd} period	Li		D			O	J	Ne
3^{rd} period	A	Mg	E	Si		H	M	
4^{th} period	R	T	I		Q	U		Y

In the above table, H does not represent hydrogen. Some elements are given in their own symbol and position in the periodic table while others are shown with a letter. Answer the following questions.

(i) Identify the most electronegative element.

(ii) Identify the most reactive element of Group I.

(iii) Identify the element from Period 3 with the least atomic size.

(iv) How many valence electrons are present in Q?

(v) Which element from group 2 would have the least ionisation energy?

(vi) Identify the noble gas of the fourth period.

(vii) Identify the element which has the highest ionisation potential.

(13)

(a) There are three elements E, F, G with atomic numbers 19, 8 and 17 respectively. Classify the above elements as metals and non-metals.

(b) Name: A metal present in Period 3, Group I of the periodic table.

(14) The elements of one short period of the periodic table are given below in order from left to right: Li Be B C O F Ne

(a) To which period do these elements belong?

(b) One element of this period is missing. Which is the missing element and where should it be placed?

(c) Place the three elements: Fluorine, Beryllium and Oxygen in the order of increasing electronegativity.

(d) Which one of the above elements belongs to the halogen series?

(15) Choose the word or phrase from the brackets which correctly completes each of the following statements:

(a) The element below sodium in the same group would be expected to have a _____ (lower/higher) electronegativity than sodium, and the element above chlorine would be expected to have a (lower/higher) ionisation potential than chlorine.

(b) On moving from left to right in a given period, the number of shells_____ (remains the same/increases/ decreases).

(c) On moving down a group, the number of valence electrons _____ (remains the same/increases/decreases).

(16) Fill in the blanks by selecting the correct word from the brackets:

(a) If an element has a low ionization energy then it is likely to be _____ (metallic / non-metallic).

(b) If an element has one electron in its outermost shell then it is likely to have the _____ (largest / smallest) atomic size among all the elements in the same period.

END