
	INDIAN SCHOOL AL WADI AL KABIR	
Class: X	Department: SCIENCE 2021 – 22 SUBJECT : CHEMISTRY	Date of completion: 27-02-22
Worksheet No: 05 WITH ANSWERS	CHAPTER: PERIODIC CLASSIFICATION OF ELEMENTS	Note: A4 FILE FORMAT
Name of the student:	Class & Sec:	Roll No:

OBJECTIVE TYPE QUESTIONS

MULTIPLE CHOICE QUESTIONS

- An element X with atomic number 12 forms a compound with element Y with atomic number 17. The formula of the compound formed is
 (a) XY (b) XY₂ (c) X₂Y (d) X₂Y₃
- An element has 12 protons. The group and period to which this element belongs to is:
 (a) 2nd group and 3rd period
 (b) 2nd group and 2nd period
 (c) 3rd group and 2nd period
 (d) 3rd group and 3rd period
- An element has atomic number 17. To which group, period does it belong? Is it a metal or a non-metal?
 (a) 7th group, 2nd period, non-metal
 (b) 17th group, 3rd period, non-metal
 (c) 7th group, 3rd period, metal
 (d) 17th group, 3rd period, metal
- The element which has least tendency to lose electron is:
 (a) H
 (b) Li
 (c) He
 (d) Na
- Cl, Br and I is a Döberiner's triad. If the atomic masses of Cl and I are 35.5 and 127 respectively then the atomic mass of Br is
 (a) 162.5 (b) 91.5 (c) 81.25 (d) 45.625
- According to Mendeleev's periodic law, the properties of elements are a periodic function of their
 (a) atomic numbers

- (b) atomic masses
- (c) atomic volumes
- (d) atomic sizes.

ASSERTION-REASONING QUESTIONS

For the following questions, two statements are given-one labelled Assertion (A) and the other labelled Reason(R). Select the correct answer to these questions from the options

(i) , (ii), (iii) and (iv)as given below:

(i)Both A and R are true and R is the correct explanation of the Assertion.

(ii)Both A and R are true but R is not the correct explanation of the Assertion.

(iii)A is true but R is false.

(iv)A is false but R is true.

7. Assertion: - Group 1 and 2 elements are metals.
Reason: - Group 1 and 2 elements can lose electrons easily to form cations.
8. Assertion: - K is more reactive than Na
Reason: - K is smaller in size than Na
9. Assertion: - Fluorine is more reactive than chlorine.
Reason: - Fluorine and chlorine belong to group 17 called Halogen.

ONE MARK QUESTIONS

10. Lithium, sodium and potassium form a Dobereiner's triad. The atomic masses of Lithium and Potassium are 7 and 39 respectively. Predict the atomic mass of Sodium.
11. Out of Li and K which has strong metallic character and why?
12. State the periodic law on which Modern periodic table is based.

TWO MARK QUESTIONS

13. An element has atomic number 13.
 - (a) What are the group and period number to which this element belongs?
 - (b) Is this element a metal or a non-metal? Justify your answer.
14. The formula of magnesium oxide is MgO. State the formula of barium nitrate and barium sulphate, if barium belongs to the same group as magnesium.
15. Four elements A, B, C and D have atomic numbers 12, 13, 14 and 15 respectively. Answer the following questions giving reasons.
 - i) What is the number of valence electrons and valency of B?
 - ii) Which of them will have largest atomic radii?
 - iii) Which of these elements will form the most basic oxide?
16. The electronic configuration of an element 'X' is 2,8,6. To which group and period of the modern periodic table does 'X' belong. State its valency and justify your answer in each case.

17. List any two properties of the elements belonging to the first group of the modern periodic table.

THREE MARK QUESTIONS

18. The atomic number of an element is 20.
(a) Write its electronic configuration and determine its valency.
(b) Is it a metal or a non-metal?
(c) Write the formula of its chloride.
(d) Is it more reactive or less reactive than Mg (atomic number 12)? Give reason for your answer.
19. Given below are some elements of the modern periodic table: ${}^4\text{Be}, {}^9\text{F}, {}^{14}\text{Si}, {}^{19}\text{K}, {}^{20}\text{Ca}$
(a) Select the element that has one electron in the outermost shell. Write its electronic configuration.
(b) Select two elements that belong to the same group. Give reason for your answer.
(c) Select two elements that belong to the same period. Which one of the two has bigger atomic size?
20. (i) How would the tendency to gain electrons change as you go (a) from left to right across a period? (b) Down a group?
(ii) How does the metallic character of the elements vary (i) in a group (ii) in a period of the modern periodic table?

FIVE MARK QUESTIONS

21. The position of eight elements in the periodic table is given below where atomic numbers of elements are given in the parenthesis.

Period No:		
2	Li(3)	Be(4)
3	Na(11)	Mg(12)
4	K(19)	Ca(20)
5	Rb(37)	Sr(38)

- (a) Write the electronic configuration of Ca.
(b) Predict the number of valence electrons in Rb.
(c) What is the number of shells in Sr?
(d) Predict whether K is a metal or a non-metal.
(e) Which of these elements has the largest atom in size?
(f) Arrange Be, Ca, Mg and Rb in the increasing order of the size of their respective atoms.
22. From the elements Li, Mg, C, S, K and Al, Identify,
(a) The elements belonging to the same group
(b) Element which has the tendency to lose two electrons
(c) The most metallic element

- (d) The elements that form metallic oxide
 (e) The element that belongs to group 13.
23. The atomic number of Cl is 17. On the basis of this information, answer the questions that follow:
- (a) Write the electronic configuration of Cl.
 (b) Find its valency.
 (c) To which group and period does it belong?

PREVIUOS YEAR BOARD QUESTIONS

24. Two elements X and Y belong to group 1 and 2 respectively and are in the same period of the periodic table. How do the following properties of X and Y vary?
- i. Size of their atom
 - ii. Their metallic character
 - iii. Their valencies in forming oxides.
 - iv. Molecular formula of their chlorides.
25. Li, Be, B, C, N, O, F and Ne are placed in the same period.
- i. What is the criterion for placing elements in the same period?
 - ii. Identify the non – metals among them.
 - iii. How does the atomic radius changes as we go from left to right in a period?
26. Given below are some elements of the modern periodic table:
 ${}^4\text{Be}$, ${}^9\text{F}$, ${}^{14}\text{Si}$, ${}^{19}\text{K}$, ${}^{20}\text{Ca}$
- i. Select the element that has one electron in the outermost shell and write its electronic configuration.
 - ii. Select two elements that belong to the same group. Give reason for your answer.
 - iii. Select two elements that belong to the same period. Which one of the two has bigger atomic size?
27. Table given below shows a part of the periodic table.

H							He
Li	Be	B	C	N	O	F	Ne
Na	Mg	Al	Si	P	S	Cl	Ar

Using this table explain why

- (a) Li and Na are considered as active metals.
 - (b) Atomic size of Mg is less than that of Na.
 - (c) Fluorine is more reactive than chlorine.
28. The position of elements A, D, E, F, G, H and I in the Modern Periodic Table is given as under:

Group		16	17	18
Period	→			
1	↓	A		
2		D	E	F
3		G	H	I

- (a) In which group are inert elements placed?
- (b) What type of ions would D and E form?
- (c) How many shells would A have?
- (d) What is the similarity between E and H?

CASE STUDY BASED QUESTIONS

29. In 1913, Henry Moseley showed that atomic number of the element is the more fundamental property than its atomic mass. Accordingly, Mendeleev's periodic law was modified and atomic number was adopted as the basis of modern periodic table.

In this periodic table, the elements are arranged in increasing order of their atomic numbers.

There are 18 groups and 7 periods in the modern periodic table. All the members of a particular group have similar outer electronic configuration.

- (i) According to modern periodic law, the properties of elements are the periodic function of their
 - (a) Atomic mass
 - (b) Atomic volumes
 - (c) Atomic numbers
 - (d) Densities
- (ii) All the elements in a period of the periodic table have the same
 - (a) Atomic number
 - (b) Electronic configuration
 - (c) Atomic weight
 - (d) Valence shell
- (iii) Which of the following combinations of elements belong to the same group?
 - (a) N, P, As
 - (b) Li, Be, Al
 - (c) Na, Mg, Al
 - (d) O, S, Cl
- (iv) The atoms of elements belonging to the same group of periodic table have same number of
 - (a) Protons
 - (b) Neutrons
 - (c) Electrons
 - (d) Electrons in outer shell
- (v) In the periodic table, the element with atomic number 16 will be placed in the group
 - (a) Fourteen
 - (b) Sixteen
 - (c) Thirteen
 - (d) Fifteen

30. Maximum number of electrons that can be accommodated in a shell is given by the formula $2n^2$. In the modern periodic table, the elements are placed according to their electronic configuration. The elements present in any group have the same number of valence electrons. The elements present in any period contain the same number of shells. The first period has 2 elements. Second period has 8 elements.

- (i) Electronic configuration of an element X is 2,1. The number of elements present in the period to which X belongs is:
 (a) 8
 (b) 32
 (c) 18
 (d) 2
- (ii) Among the given elements A, B, C, D and E with atomic numbers 2, 3, 7, 10 and 30 respectively, which of these belong to the same period?
 (a) A, B, C
 (b) B, C, D
 (c) A, D, E
 (d) B, D, E
- (iii) The elements A, B, C and D have atomic numbers 4, 12, 17 and 19 respectively. Which pair of elements belong to the same period?
 (a) B and C
 (b) A and B
 (c) A and D
 (d) C and D
- (iv) Which of the following have the same number of electrons in outermost shell?
 (a) Elements with atomic numbers 3, 11, 19
 (b) Elements with atomic numbers 14, 15, 16
 (c) Elements with atomic numbers 12, 20, 28
 (d) Elements with atomic numbers 10, 18, 26
- (v) Which of the following elements has two shells and both are completely filled?
 (a) Helium
 (b) Neon
 (c) Calcium
 (d) Fluorine

ANSWERS

OBJECTIVE TYPE QUESTIONS

MULTIPLE CHOICE QUESTIONS

Qn.No.	Answers
1	(b) XY_2
2	(a) 2 nd group and 3 rd period
3	(b) 17 th group, 3 rd period, non-metal
4	(c) He
5	(c) 81.25
6	(b) atomic masses

ASSERTION-REASONING QUESTIONS

7	(i)Both A and R are true and R is the correct explanation of the Assertion.
8	(iii)A is true but R is false.
9	(ii)Both A and R are true but R is not the correct explanation of the Assertion.

ONE MARK QUESTIONS

10	23
11	Potassium will have stronger metallic character because metallic character increases down a group. Thus, out of Li and K, K has more metallic character.
12	Modern periodic law:- Properties of elements are periodic function of their atomic numbers.

TWO MARK QUESTIONS

13	(a)Group-13, Period-3 (b) It is a metal as it can lose 3 electrons and form positive ion.
14	Barium nitrate – $\text{Ba}(\text{NO}_3)_2$ Barium sulphate- BaSO_4
15	(i) Number of valence electrons-3, Valency-3 (ii) A (iii) A
16	Group-16(6 valence electrons, so $6+10=16$), Period-3(3 shells) Valency=2(6 electrons in the last shell and it gains 2 electrons to attain stable octet electronic configuration.)
17	First group elements are also known as alkali metals (a) These elements exhibit +1 valency. (b) These are very reactive and not found freely in nature.

THREE MARK QUESTIONS

18	(a) Electronic configuration-2,8,8,2. Valency-2 (b) Metal (c) CaCl_2 (d) Calcium is more reactive than magnesium because the calcium atom is larger than the magnesium atom. (calcium and magnesium belong to the same group. Down the group atomic size increases)
19	(a) K, electronic configuration- 2,8,8,1 (b) Be and Ca (2 electrons in the valence shell. So, these belong to group-2) (c) (i) Be and F (Be is bigger)

	(ii) K and Ca (K is bigger)
20	<p>(i) (a) tendency to gain electron increases from left to right. Across a period, Atomic size decreases. Effective nuclear charge increases. Tendency to gain electron increases. Non-metallic property or electronegativity increases</p> <p>(b) down the group, tendency to gain electrons decreases.</p> <ul style="list-style-type: none"> ▪ Down the group, the atomic size increases. The distance between the electron and the nucleus increases. The effective nuclear charge experienced by the electron decreases. Hence the tendency to accept electron decreases or non-metallic property or electronegativity decreases <p>(ii) (i) Metallic property or electro positivity increases down the group</p> <p>(ii) Along a period, Shell number remains the same, the number of protons increases, effective nuclear charge increases, The pull exerted by the nucleus on electrons increases, hence metallic property i.e. tendency to lose electron decreases</p>

FIVE MARK QUESTIONS

21	<p>(a) 2,8,8,2 (b) 1 (c) 5 (d) K is a metal (e) Rb (f) $Be < Mg < Ca < Rb$</p>
22	<p>(a) Li and K (b) Mg (c) K (d) Li, Mg, K, Al (e) Al</p>
23	<p>(a) 2,8,7 (b) 1 (c) Group-17, Period-3</p>

PREVIUOS YEAR BOARD QUESTIONS

24	<p>(i) X is bigger than Y (ii) X is more metallic (iii) Valency of X-1, Y-2 (iv) XCl, YCl_2</p>
25	<p>(i) Same number of shells (ii) C, N, O, F and Ne</p>

	(iii) Atomic radius decreases.
26	(i) K, electronic configuration-2,8,8,1 (ii) Be and Ca (belong to group-2 as these have two valence electrons.) (iii) Be and F (Be is bigger than F)
27	(a) Because these can remove 1 electron easily and form positive ion. (b) From left to right in a period, atomic size decreases. Magnesium has more nuclear charge compared to sodium. (c) Fluorine is smaller than chlorine. electronegativity is more for fluorine and it can gain electrons easily.
28	(a) Group-18 (b) D and E forms anions (c) 1 shell (d) Contain same number of valence electrons(belong to same group)

CASE STUDY BASED QUESTIONS

29	(i) (a)Atomic mass (ii)(d) Valence shell (iii)(a) N, P, As (iv)(d) Electrons in outer shell (v)(b) sixteen
30	(i) (a)8 (ii) (b)B, C, D (iii) (a)B and C (iv) (a) Elements with atomic numbers 3, 11, 19 (v) (b)Neon

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