

Assignment - 4

- ⌘ Periodic Table
- ⌘ Chemical Bonding
- ⌘ Electrolysis

PERIODIC TABLE
Assignment Sheet

- What is the common feature of the electronic configurations of the elements at the end of Period 2 and Period 3?
 - If an element is in Group 7 (or Group 7A), is it likely to be metallic or non-metallic in character?
 - Supply the missing word from those in brackets.
If an element has one electron in its outermost energy level then it is likely to be (metallic / non-metallic) **[2000]**
- State the number of elements in Period 1, Period 2, and Period 3 of the Periodic Table.
 - Name the elements in Period 1.
 - What happens to atomic size of elements on moving from left to right in a Period? **[2000]**
- Copy and complete the following sentences choosing the correct word or words from those given in brackets at the end of each sentence:
 - The properties of elements are a periodic function of their (atomic number, mass number, relative atomic mass)
 - Moving across a of the Periodic Table the elements show increasing character. (Group, Period, metallic non-metallic)
 - The element at the bottom of a Group would be expected to show metallic character than the element at the top. (less, more)
 - The similarities in the properties of a Group of elements is because they have the same (electronic configurations, number of outer electrons, atomic numbers.) **[2001]**
- Answer the following questions :
 - What is meant by a Group in the Periodic Table?
 - Within a Group where would you expect to find the element with : the greatest metallic character?
 - State whether the ionization potential increases or decreases on going down a Group.
 - How many elements are there in Period 3 ? **[2002]**
- The following table represents the first three Periods of the Modern Periodic Table. Study the table and answer the questions that follow :

1A																		O
1																		2
H	2A																	He
3	1																	
Li	H																	
11	12																	
Na	Mg																	
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	

- (a) Write the formula of the sulphate of the element with atomic number 13.
- (b) Name the element which has the highest ionization potential.
- (c) Which feature of the atomic structure accounts for the similarities in the chemical properties of the elements in Group 7A of the Periodic Table?
- (d) What is the name given to the energy released when an atom in its isolated gaseous state accepts an electron to form an anion?
- (e) Fill in the blanks :
The atomic size as we move from left to right across the Period because the increases but the remains the same. **[2003]**

6. The electronegativities (according to Pauling) of the elements in Period 3 of the Periodic Table are as follows with the 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

- (a) 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 7).
- (b) Choose the word or phrase from the brackets which correctly completes each of the following statements :
- (i) The element below sodium in the same Group would be expected to have a (higher / lower) electronegativity than sodium and the element above chlorine would be expected to have a (higher / lower) ionization potential than chlorine.
- (ii) On moving from left to right in a given Period, the number of shells (remains the same / increases / decreases).
- (iii) On moving down a Group, the number of valence electrons (remains the same / increases / decreases). **[2004]**
7. State the correct answer for changes in properties of elements on moving left to right across a period.
- (i) Non-metallic character of elements - A : decreases, B : increases, C : remains same, D : depends on period.
- (ii) The electronegativity :- A : depends on no. of valence electrons, B : remains the same, C : decreases, D : remains the same.
- (iii) The ionization potential : - A : goes up and down, B : decreases, C : increases, D : remains the same.
- (iv) Atomic size :- A : decreases, B : increases, C : remains the same, D : sometimes increase or decreases.
- (v) Electron affinity of elements in groups 1-7 :- A : goes up & then down, B : decreases then increases, C : increases, D : decreases. **[2005]**
8. 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) Which one of the elements in this Period shows the property of catenation?

- (d) Place the three elements fluorine, beryllium and nitrogen in the order of increasing electronegativity.
 (e) Which one of the above elements belongs to the halogen series? [2006]

9. A group of elements in the Periodic Table is given below (Boron is the first member of the group and Thallium is the last).

Boron
 Aluminium
 Gallium
 Indium
 Thallium

Answer the following questions in relation to the above group of elements.

- (a) Which element has the most metallic character?
 (b) Which element would be expected to have the highest electronegativity?
 (c) If the electronic configuration of aluminium is 2, 8, 3, how many electrons are there in the outer shell of Thallium ?
 (d) The atomic number of Boron is 5. Write the chemical formula of the compound formed when Boron reacts with Chlorine.
 (e) Will the elements in the Group to the right of this Boron group be more metallic or less metallic in character? Justify your answer. [2007]

10. The following questions refer to the Periodic Table :

- (a) (i) Name the first and last elements in Period 2.
 (ii) What happens to the atomic size of elements moving from top to bottom of a group?
 (iii) Which of the elements has the greatest affinity among the halogens?
 (iv) What is the common feature of the electronic configurations of the elements in group?
 (b) Supply the missing word from those in the brackets (Do not write out the sentence).
 (i) If an element has a low ionization potential then it is likely to be (metallic / non-metallic)
 (ii) If an element has seven electrons in its outermost shell then it is likely to have the (largest/smallest) atomic size among all the elements in the same period. [2008]
 (c) (i) The metals of Group 2 from top of bottom are Be, Mg, Ca, Sr, Ba. Which of these metals will form ions most readily and why?
 (ii) What property of an element is measured by electronegativity? [2008]

11. Consider the section of the Periodic Table given below : [2009]

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

Notes : In this table

B does not represent boron.

C does not represent carbon.

F does not represent fluorine.

H does not represent hydrogen.

K does not represent potassium.

You must see the position of the element in the Periodic Table.

Some elements are given in their own symbol and position in the Periodic Table while others are shown with a letter. With reference to 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?
 (d) In the compound between F and J, what type of bond will be formed?
 (e) Draw the electron dot structure for the compound formed between C and K.
12. Define the following terms :
 (i) Ionization potential.
 (ii) Electron affinity. [2010]
13. An element has an atomic number 16. State
 (i) the period to which it belongs
 (ii) the number of valence electrons.
 (iii) whether it is a metal or non-metal. [2010]
14. Give the number of the group and the period, of the element having three shells with three electrons in valence shell. [2011]
15. Choose the correct answer from the options : An element in period 3 whose electron affinity is zero. A : Neon, B : Sulphur, C: Sodium, D : Argon [2012]
16. Give reasons :
 (i) IP. of elements increases across a period.
 (ii) Alkali metals are good reducing agents. [2012]
17. There are three elements E, F, G with atomic numbers 19, 8 and 17 respectively - Classify the above elements as metals and non-metals. [2012]
18. Name : A metal present in period 3, group I of the periodic table. [2012]
19. Choose the most appropriate answer from the following options:
 Among the period 2 elements, the element which has high electron affinity is
 (a) Lithium (b) Carbon
 (c) Chlorine (d) Fluorine [2013]
20. Consider the section of the Periodic Table given below : [2013]

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

- In this 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. With reference to the table.

With reference to the table answer the following questions :

- (i) Identify the most electronegative element.
 - (ii) Identify the most reactive element of group 1.
 - (iii) Identify the element from period 3 with least atomic size.
 - (iv) How many valence electrons are present in Q ?
 - (v) Which element from group 2 would have the least ionization energy ?
 - (vi) Identify the noble gas of the fourth period.
 - (vii) In the compound between A and H what type of bond would be formed and give the molecular formula for the same.
21. Identify the element which has the highest ionization potential. **[2013]**
22. Choose the correct answer from the options given below :
- (i) Ionisation Potential increases over a period from left to right because the :
 - (A) Atomic radius increases and nuclear charge increases
 - (B) Atomic radius decreases and nuclear charge decreases
 - (C) Atomic radius increases and nuclear charge decreases
 - (D) Atomic radius decreases and nuclear charge increases. **[2014]**
 - (ii) If an element A belongs to Period 3 and Group II then it will have.
 - (A) 3 shells and 2 valence electrons
 - (B) 2 shells and 3 valence electrons
 - (C) 3 shells and 3 valence electrons
 - (D) 2 shells and 2 valence electrons **[2014]**
23. Give one word or phrase for the following :
The amount of energy released when an atom in the gaseous state accepts an electron to form an anion. **[2014]**
24. An element Z has atomic number 16. Answer the following questions on Z:
 - (i) state the period and group to which Z belong.
 - (ii) State the formula between Z and Hydrogen.
 - (iii) What kind of a compound is this? **[2014]**
25. Choose the most appropriate answer for each of the following:
Among the elements given below, the element with the least electronegativity is:
 - (A) Lithium
 - (B) Carbon
 - (C) Boron
 - (D) Fluorine **[2015]**
26. Arrange the following as per the instructions given in the brackets:
 - (i) Cs, Na, Li, K, Rb (increasing order of metallic character).
 - (ii) Mg, Cl, Na, S, Si (decreasing order of atomic size).
 - (iii) Na, K, Cl, S, Si (increasing order ionization energy)
 - (iv) Cl, F, Br, I (increasing order of electron affinity) **[2015]**

27. Identify the term/substance in each of the following:
- The tendency of an atom to attract electrons to itself when combined in a compound.
 - The electrons present in the outermost shell of an atom. **[2016]**
28. Rewrite the following sentences by using the correct symbol > (greater than) or < (less than) in the blanks given:
- The ionization potential of Potassium is _____ that of Sodium.
 - The electronegativity of Iodine is _____ that of Chlorine. **[2016]**
29. Use the letters only written in the Periodic Table given below to answer the question that follow.
- State the number of valence electrons in atom 3.
 - Which element shown forms ions with a single negative charge?
 - Which metallic element is more reactive than R?
 - Which element has its electrons arranged in four shells? **[2016]**

		GROUPS																
		I									III	IV	V	VI	VII	0		
PERIODS	1		II															L
	2	O										E	G	J	Z	M		
	3	R																
	4	T																
	5																	

30. Fill in the blanks by selecting the correct word from the brackets:
- If an element has a low ionization energy then it is likely to be _____ (metallic/non metallic)
 - If an element has seven electrons in its outermost shell then it is likely to have the _____ (largest / smallest) atomic size among all the elements in the same period. **[2016]**
31. Fill in the blanks from the choices given in brackets:
- The energy required to remove an electron from a neutral isolated gaseous atom and convert it into a positively charged gaseous ion is called _____. (electron, affinity, ionisation potential, electronegativity) **[2017]**
32. Arrange the following as per the instruction given in the brackets :
- He, Ar, Ne (Increasing order of the number of electron shells)
 - Na, Li, K (Increasing Ionisation Energy)
 - F, Cl, Br (Increasing electronegativity)
 - Na, K, Li (Increasing atomic size) **[2017]**

