Short Question Answer

Question.1 The elements of the second period of the Periodic Table are given below:

Li Be B C N O F

(a) Give reason to explain why atomic radii decrease from Li to F.

(b) Identify the most

(i) metallic and

(ii)non-metallic element.

Answer.

(a) It is because nuclear charge increases due to increase in atomic number, therefore, force of attraction between nucleus and valence electrons increases, i.e. effective nuclear charge increases, hence atomic radii decrease from Li to F.

(b) (i) Most metallic element is ‘Li’ as it

can lose electrons easily due to larger atomic size.

(ii) Most non-metallic element is ‘F’ because it can gain electrons easily due to smallest atomic size.

Question.2 The elements of the third period of the Periodic Table are given below:

(a) Which atom is bigger, Na or Mg? Why?

(6) Identify the most (i) metallic and (ii) non-metallic element in Period 3.

Answer. (a) Sodium is bigger than magnesium as it has lesser nuclear charge so there is less force of attraction between nucleus and valence electrons and less effective nuclear

charge. It is, therefore, bigger in size.

(b) (i) Sodium is the most metallic as it can lose electrons easily due to its larger atomic size,

(ii) Chlorine is the most non-metallic element because it can gain electrons easily due to its smallest atomic size.

Question.3 The position of three elements A, B and C in the Periodic Table is shown below:

Giving reasons, explain the following:

(a) Element A is a non-metal.

(b) Element B has a larger atomic size than element C.

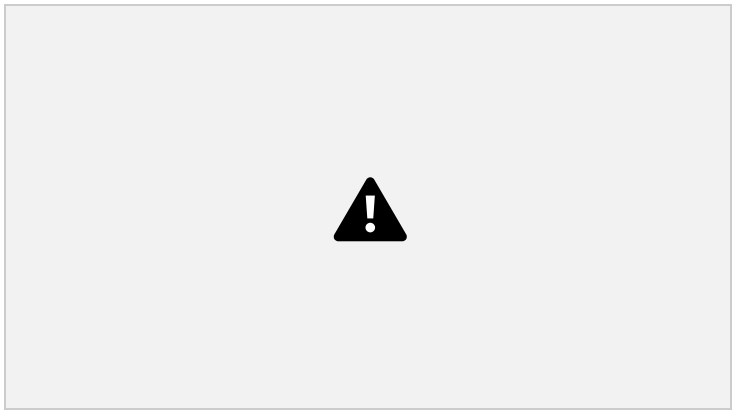
(c) Element C has a valency of 1

Answer. (a) ‘A’ is non-metal because it can gain electron easily as it has 7 valence electrons and forms negative ion with stable electronic configuration.

(b) It is because ‘B’ has lesser atomic number, less nuclear charge, less force of attraction between valence electrons and nucleus therefore, has larger atomic size.

(c) ‘C’ has 7 valence electrons. It can gain one electron to become stable. So, its valency is equal to one.

Question.4 The position of three elements A, B and C in the Periodic Table is shown below:



Giving reasons, explain the following:

(a) Element A is non-metal.

(b) Atom of element C has a larger size ‘ than atom of element A.

(c) Element B has a valency of 1.

Answer. (a) It is because it has 7 valence electrons.

It can gain one electron to form negative ion. So, it is a non-metal.

(b)’C’ has more number of shells than A. So, it is larger in size.

(c)’B’ has one valence electron. It can lose one

electron to become stable. So, its valency is equal to 1.

Question.5 What physical and chemical properties of elements were used by Mendeleev in creating his periodic table? List two observations which posed a challenge to Mendeleev's Periodic Law.

Answer. Atomic mass as a physical property and nature and formulae of oxide and hydride formed, and chemical property was used by Mendeleev.

Following are the two observations which posed a challenge to Mendeleev's Periodic Law.

(i) Increasing order of atomic weights could not be maintained while matching chemical properties. Chemical properties do not depend upon atomic mass.

(ii) Isotopes have different atomic mass but

same chemical properties.

Question.6 Table given below shows a part of the Periodic Table.

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(b) Atomic size of Mg is less than that of Na.

(c) Fluorine is more reactive than Chlorine.

Answer.

(a) They can lose electrons easily due to bigger size; energy required to remove electron is less.

(b) It is because of greater effective nuclear charge on Mg, i.e. more number of protons attract more number of electrons than Na.

(c) 'F' can form F^- more easily than Cl due to smaller atomic size. F^- is more stable than Cl^-.

Therefore, fluorine is more reactive than chlorine.

Question.7 (a) Why do we classify elements?

(b) What were the two criteria used by Mendeleev in creating his Periodic Table?

(c) Why did Mendeleev leave some gaps in his Periodic Table?

(d) In Mendeleev's Periodic Table, why was there no mention of Noble gases like Helium, Neon and Argon?

(e) Would you place the two isotopes ' of chlorine, Cl-35 and Cl-37 in

different slots because of their different atomic masses or in the same slot because their chemical properties are the same? Justify your answer.

Answer.

(a) It is done so as to study the properties of elements conveniently.

(b) Increasing order of atomic mass and similarities in chemical properties (especially nature and formulae of oxide and hydride formed).

(c) These gaps were left for undiscovered elements.

(d) Noble gases were not invented at that time.

(e) They will be kept at same slot as they have same chemical properties.