Chapter 8. The Periodic Table

Exercise 8

Solution 1.

(a) In 1913, Mosley made an important discovery of atomic number. Thus, he gave the modern periodic law that states that, The physical and the chemical properties of elements are the periodic functions of their atomic numbers.
(b) Eighteen groups and seven periods.

Solution 2.

Last elements of each period have outer most shell complete i.e. 2 or 8 electrons.
Name is Inert-gases or Noble gases.

Solution 3.

(a) A group: Vertical columns in a periodic table which have same-number of valence electrons, and similar chemical properties are called a group.
(b) A period: In a periodic table elements are arranged in the order of increasing atomic numbers in horizontal rows called periods.

Solution 4.

Atomic number can determine that which element will be the first and which is the last in a period of the periodic table.

Solution 5.

(a) Group I A elements: Lithium, Sodium.
(b) Group 17 element: Fluorine, Chlorine
(c) Group 18 (zero group elements) : Helium; Neon

Solution 6.

(a) Group IA is known as Alkali Metals group.
(b) Group 17 is known as Halogens group. (c) Group 18 is known as Transition elements.

Solution 7.

(a) Number of elements in 1st period of the modem periodic table – 2 (two) (b) Number of elements in 3rd period of the modem periodic table – 8 (eight)

Solution 8.

(a) Increases
(b) Increases

Solution 9.

The valency of elements increases from 1 to 4 upto the element carbon(C), and then falls to 1 upto the element fluorine (F) and Neon (Ne) Zero.
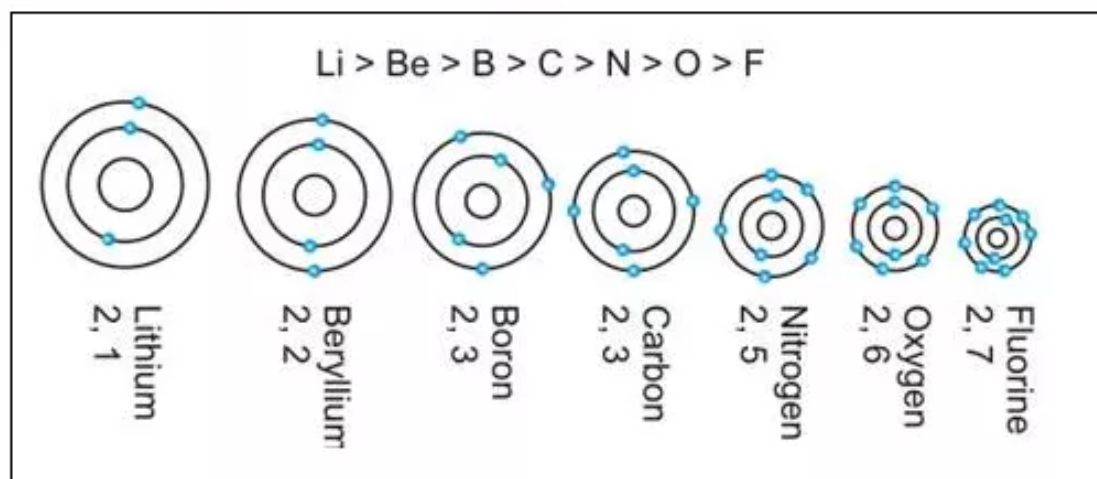
Solution 10.

(a) periods
(b) increases
(c) decreases

Solution 11.

In a period, the size of an atom decreases from left to right. This is because the nuclear charge increases from left to right in the same period, thereby bringing the outermost shell closer to the nucleus.
Thus, in a particular period, the alkali atoms have the largest size and the halogen atoms are the smallest.

Li > Be > B > C > N > O > F

Li > Be > B > C > N > O > F

Lithium 2, 1 | Beryllium 2, 2 | Boron 2, 3 | Carbon 2, 3 | Nitrogen 2, 5 | Oxygen 2, 6 | Fluorine 2, 7

Solution 12.

(a) (i) Hand P are noble gases
(ii) G and 0 are halogens
(iii) A and I are alkali metals
(iv) D and L have valency of 4.

(b) The formula of the resulting compound will be **Li_2O.** Because, A stands for Lithium and F stands for O and valency of Lithium is +1 and valencyof O is -2. That is, A_2 F.

(c) The atomic number of G is 9. Therefore, its electronic arrangement is 2 and 7. That is, (2, 7).

Solution 13.

This is because; Na and Al have capacity to donate the electron due to which there valency is positive. Whereas Cl and K can gain or lose one electron due to which their valency is -1 and + 1 respectively. Only this is the difference between these two.

Solution 14.

(a) The greatest metallic character can be expected at the bottom of the group.
(b) The largest atomic size can be expected at the lower part of the group.

Solution 15.

No. of valence electrons remain same as we go down in a group that too on the left side of a period.

Solution 16.

(a) Magnesium is the 'x' element which belongs to the third period and group II of the periodic table and has atomic number 2. Therefore, the number of valence electrons are 2 (two).
(b) Valency is + 2.
(c) Alkaline earth metals.
(d) The elements is Magnesium

Solution 17.

(a) VII A
(b) Third period
(c) Seven
(d) Valency of T = -1
(e) Non – metal

Solution 18.

(a) Helium
(b) Silicon
(c) 4, 3
(d) Argon
(e) Noble gases
(f) Carbon tetrachloride (CCl_4)
(g) Silicon, Phosphorus
(h) Sodium chloride (NaCl)
(i) Li and Mg; Be and Al; B and Si
(j) Sodium
(k) Typical elements of Period 2 belonging to group 14 and 15 are carbon and nitrogen. Typical elements of' Period 3 belonging to group 14 to 15 are silicon and phosphorus.
(l) Beryllium

Solution 19.

Column A	Column B
(a) Elements short of 1 electron in octet	(v) Halogens
(b) Highly reactive metals	(iii) Alkali metals

(c) Unreactive elements	(ii) Noble gases
(d) Elements of groups 3 to 12	(i) Transition elements
(e) Radioactive elements	(vi) Actinides
(f) Elements with 2 electrons in outermost orbit	(iv) Alkaline earth metals

Solution 20.

Atomic No.	Element	Electronic configuration	Select element of same group
11	Sodium	2,8,1	
			K
			N
15	Phosphorus	2,8,5	
			O
16	Sulphur	2,8,6	
			Cl
9	Fluorine	2,7	

Solution 21.

The relative atomic mass of a light element up to calcium is approximately 20 its atomic number.

Solution 22.

Atomic number of P = 19
Electronic configuration = 2, 8, 8, 1 Group number of the element = 1 A Period number of the element = 4
P is a metal.