Chemistry Study Materials for Class 10

(Based on: Periodic Classification of Elements)

Ganesh Kumar Date:- 16/08/2021

Mendeleev's Periodic Table

In 1869, Mendeleev classified the then known 63 elements on the basis of their physical and chemical properties(formation of hydride and oxide) in the increasing order of the atomic masses, in the form of a table. Mendeleev had observed that properties of the elements orderly recur in a cyclic fashion. He found that the elements with similar properties recur at regular intervals when the elements are arranged in the order of their increasing atomic masses. He concluded that 'the physical and chemical properties of the elements are periodic functions of their atomic masses'. This came to be known as the law of chemical periodicity and stated: that the physical and chemical properties of elements are periodic function of their atomic weights.

Based on this law all the known elements were arranged in the form of a table called the 'Periodic Table'. Elements with similar properties recurred at regular intervals and fell in certain groups or families. The elements in each group were similar to each other in many properties. The elements with dissimilar properties from one another were separated. Mendeleev's periodic table contains eight vertical columns of elements called 'groups' and seven horizontal rows called 'periods', Each group has two sub-groups A and B. The properties of elements of a sub-group resemble each other more markedly than the properties of those between the elements of the two sub-groups.

In other words

Mendeleev believed that the atomic mass of an element was the most fundamental property in classifying elements.

Mendeleev arranged elements in the increasing order of their atomic masses and observed that the elements showed repetition after certain intervals in their physical

and chemical properties.

He arranged the known elements in the increasing order of their atomic masses in horizontal rows, till he encountered an element which had properties similar to the first element.

Mendeleev placed the element below the first element and started the second row of elements.

Proceeding in this way, he created the first periodic table containing 63 elements, arranged according to their properties.

Mendeleev's Periodic Law: The physical and chemical properties of elements are a periodic function of their atomic masses.

SERIES	GROUPS OF ELEMENTS								
	0	I	II	III	IV	V	VI	VII	VIII
1	-	Hydrogen H 1.008	-	-					
2	Helium He 4.0	Lithium Li 7.03	Beryllium Be 9.1	Boron B 11.0	Carbon C 12.0	Nitrogen N 14.04	Oxygen O 16.00	Fluorine F 19.0	
3	Neon Ne 19.9	Sodium Na 23.5	Magnesium Mg 24.3	Aluminium Al 27.0	Silicon Si 28.4	Phosphorus P 31.0	Sulphur S 32.06	Chlorine Cl 35.45	
4	Argon Ar 38	Potassium K 39.1	Calcium Ca 40.1	Scandium Sc 44.1	Titanium Ti 48.1	Vanadium V 51.4	Chromium Cr 52.1	Manganese Mn 55.0	Iron Fe 55.9 Cobalt Co 59 Nickel Ni 59 (Cu)
5		Copper Cu 63.6	Zinc Zn 65.4	Gallium Ga 70.0	Germanium Ge 72.3	Arsenic As 75	Selenium Se 79	Bromine Br 79.95	
6	Krypton Kr 81.8	Rubidium Rb 85.4	Strontium Sr 87.6	Yttrium Y 89.0	Zirconium Zr 90.6	Niobium Nb 94.0	Molybdenum Mo 96.0	-	Ruthenium Ru 101.7 Rhodium Rh 103.0 Palladium Pd 106.5 (Ag)
7		Silver Ag 107.9	Cadmium Cd 112.4	Indium In 114.0	Tin Sn 119.0	Antimony Sb 120.0	Tellurium Te 127.6	Iodine I 126.9	
8	Xenon Xe 128	Caesium Cs 132.9	Barium Ba 137.4	Lanthanum La 139	Cerium Ce 140	-	-	-	
9		-	-	-	-	-	-	-	
10	-	-	-	Ytterbium Yb 173	-	Tantalum Ta 183	Tungsten W 184	-	Osmium Os 191 Iridium Ir 193 Platinum Pt 194.9 (Au)
11		Gold Au 197.2	Mercury Hg 200.0	Thallium Tl 204.1	Lead Pb 206.9	Bismuth Bi 208	-	-	
12	-	-	Radium Ra 224	-	Thorium Th 232	-	Uranium U 239		
	R	R_2O	RO	R_2O_3	HIGHER SALINE OXIDES RO_2		R_2O_5 RO_3 R_2O_7		RO_4
					HIGHER GASEOUS HYDROGEN COMPOUNDS RH_4		RH_3 RH_2 RH		

****