Periodic Classification Of Elements
Division Of The Periodic Table In S,P,D,F Blocks

DIVISION OF THE PERIODIC TABLE IN s, p, d and f blocks:

The periodic table is divided into four main blocks (s, p, d and f) depending upon the subshell to which the valence electron enters into.

(i) Elements of group 1 and 2 constitute s-block.

(ii) Elements of group 13, 14, 15, 16, 17, 18 constitute p-block.

(iii) Elements of groups 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 constitute d-block.

(iv) The f-block element comprise two horizontal rows placed at the bottom of the periodic table to avoid its unnecessary expansion.

Elements of s and p-block are called normal or representative elements, those of d-block are called transition elements while the f-block elements are called inner transition elements.

s-Blocks Elements:

The elements in which the last electron enters the s-sub-shell of their outermost energy level and electronic configuration is ns^1 or ns^2 (I or II group) are called **s-block elements are :**

(i) They are soft metals.

(ii) They have low ionisation energies.

(ii) They are very reactive and form ionic compounds.

(iv) They show oxidation states of +1 group and +2 group.

(v) They are good reducing agents.

(vi) They form basic oxide.

p- Block Elements :

The elements in which the last electron enters the p-sub-shell of their outermost energy level are called **p-block elements.** The exception is helium ($1s^2$).

The general configuration of their outermost shell is $\mathbf{ns^2\ np^{1-6}}$**.** These elements are kept in group 13 to 18. Some of the general characteristics of p-block elements are:

(i) They show variable oxidation states.

(ii) They form ionic as well as covalent compounds.

(iii) Most of them are non-metals.

(iv) Most of them form acidic oxides.

d- Block Elements :

(i) They are hard and having high melting point.

(ii) They show variable oxidation states.

(iii) They form coloured complexes.

(iv) They form ionic as well as covalent compounds.

(v) Most of them exhibit paramagnetism.

(vi) Most of them possess catalytic properties.

f- Block Elements :

The elements in which the last electron enters the ***f*- block elements.**

Their general configuration is $\mathbf{(n-2)}\, f^{\mathbf{1-14}}\, \mathbf{(n-1)}d^{\mathbf{0-1}}\, \mathbf{ns^2}$.

They consist of two series of 28 elements

(14 in each) placed at the bottom of the periodic table.

The elements of first series followed by lanthanum ($_{57}$La) are called **Lanthanides**.

The elements of second series followed by actinium ($_{89}$Ac) are called **Actinides**.

The general

Characterstics of *f*-block elements are:

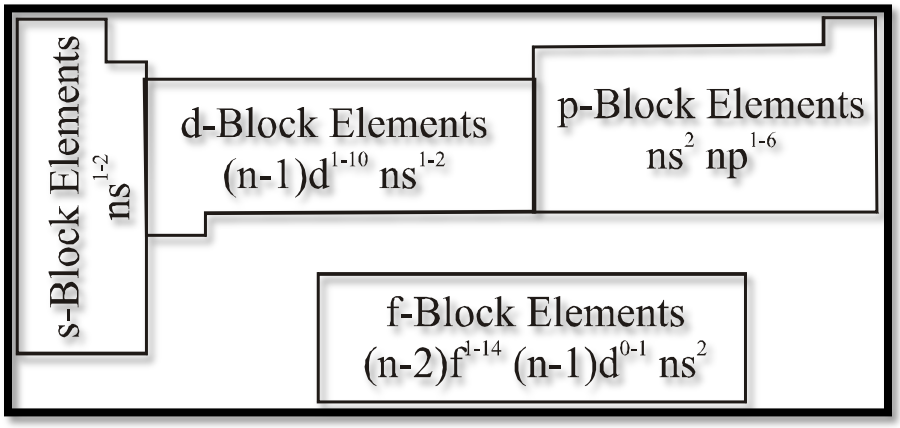
(i) They show variable oxidation states.

(ii) They have high melting points.

(iii) They have high densities.

(iv) They form coloured compounds.

(v) Most of the elements of actinide series are radioactive.



NOTE:

1. The elements of group zero are called **inert gases, noble gases, rare gases or aerogens.**
2. The elements of p-block (except noble gases) are called representative or main group elements. The members of this group of elements have all their occupied subshells filled except their outermost electron shell.

NOMENCLATURE OF ELEMENTS ATOMIC NUMBER ≥ 100:

According to IUPAC following latin word roots are used for naming of elements having atomic number greater than or equal to 100. The latin words for various digits of the atomic number are written together in the order of which makes the atomic number and suffix ium is added at the end.

Digit	0	1	2	3	4	5	6	7	8	9
Latin Word	Nil	Un	Bi	Tri	Quad	Pent	Hex	Sept	Oct	Enn
Abbrevation	n	u	b	t	q	p	h	s	o	e

For example: The element with atomic number 104 named as follows:

1 0 4 suffix

u n n i l q u a d + i u m =

u n n i l q u a d i u m

and assigned symbol ***Unq***.

Note: These IUPAC names given are temporary later on elements assigned permanent names.