

SUBJECT - CHEMISTRY
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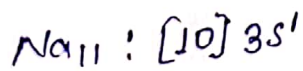
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TOPIC - Classification of elements
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Classification of elements on the basis of electronic configuration: we know that the atomic number of an element is equal to the number of electrons present in an atom of the element. Hence the modern periodic table is based on the increasing order of electrons in each element has one more electron than the preceding element. The gradual filling of electrons in orbitals in order of increasing energy leads to an atom of the elements s, p, d and f are orbitals. Hence elements are broadly classified into four blocks depending upon the presence of the last electron in a particular orbital -

(i) s-block elements (ii) p-block elements.
(iii) d-block elements (iv) f-block elements.

If the last electron is present in s-orbital, the element belongs to s-block of elements e.g. The last electron of Na is present in 3s-orbital. Hence Na is a member of s-block of elements.



Similarly, if the last electron is present in p, d and f orbitals, it means that the element belongs to p, d and f-block of elements.

(i) s-block elements: If the last electron is present in the s-orbital, the element belongs to the s-block elements. They are present in the extreme left of the periodic table in two vertical columns. Known as group 1 & 2. The group 1 elements are called alkali metals (Li, Na, K, Rb, Cs & Fr) and group 2 elements are called alkaline earths (Be, Mg, Ca, Sr, Ba & Ra) the valence configuration for group 1 & 2 elements is ns^1 & ns^2 respectively.

where $n =$ Valence Shell numbers. For these elements, the Valence orbital is the one ns orbital. The number of Valence electrons for group 1 & 2 elements is the same as the group number i.e. 1 & 2 respectively. Each element shows its maximum oxidation state when all Valence electrons are involved in the formation of bonds. The maximum oxidation state for group 1 & 2 elements is numerically equal to the group number.

Characteristics of s-block elements:

- 1 They have their last electron in ns orbitals.
 - 2 They all are metals.
 - 3 They form ionic Compounds.
 - 4 Their ions are colourless
 - 5 Their ions are diamagnetic
 - 6 Their ions have low ionic potential values.
 7. Their ions do not hydrolyse in aqueous solutions.
 8. Their ions do not form complexes.
 9. They exhibit fixed oxidation state.
 - 10 All occupied shells below the Valence shell have their full complement of electrons.
- (11) They have less standard reduction potential values than hydrogen so they are very good reducing agents.