

Chapter 05

Periodic Classification of Elements

Mendeleev's Periodic table:

Russian chemist, Mendeleev's has more contribution towards early development of periodic table to elements.

- Mendeleev arranged, then known 63 elements in increasing order of their atomic weights. He tried to classify elements based on their properties.
- Valency of element is considered as one of the basic property for classification. He observed that physical and chemical properties of elements were repeated under some regular intervals. Based on these observation. He proposed his periodic law also known as Mendeleev's Periodic law.

It states that "Physical and Chemical properties of elements are periodic functions of their atomic masses".

In Mendeleev's Periodic table,

- Vertical columns called "Groups", Horizontal rows called "Periods".
- Every group is subdivided into A & B groups except VIIIth group.
- Contains 8 groups and 6 periods.

Achievements:

- In few places the sequence was inverted to place the elements in their right places.

Ex. Co^{58.9}, Ni^{58.7} – Sequence is inverted to group the elements with same properties.

- He predicted the existence of few metals and left some gas for upcoming elements. Also named them by its preceding element.

Eka – boron $\Rightarrow$ Scandium

Eka – aluminium $\Rightarrow$ Gallium

Eka – silicon $\Rightarrow$ Germanium

- After discovery of noble gases separate group is added to periodic table to place these elements.

Limitations:

- No fixed position can be given to hydrogen.
- Isotopes of elements could not find perfect place in periodic table.
- Due to irregular increase in atomic mass, it is difficult to predict how many elements may exist in between.

