

8. PERIODIC CLASSIFICATION OF ELEMENTS

Learning Objectives

After a thorough perusal of this unit, the students will be able to:

- Recognize the basis of the modern periodic law and its development.
- List the features of groups and periods of the modern periodic table.
- Explain the trend in periodic properties along the periods and groups.
- Distinguish between ores and minerals.
- List out the types of separation of impurities from the ores.
- Recall the various places of occurrences of minerals in the state of Tamil Nadu.
- Put forth the properties of metals.
- Identify the stages involved in metallurgical processes.
- Think scientifically on alloys and their types.
- Develop an idea on amalgam.
- Understand the reason for corrosion and the methods of its prevention.

Important Notes and Results

- The **horizontal rows are called periods**. There are **seven** periods in the periodic table.
- **First period** (Atomic number 1 and 2): This is the shortest period. It contains only two elements (Hydrogen and Helium).
- **Second period** (Atomic number 3 to 10): This is a short period. It contains eight elements (Lithium to Neon).
- **Third period** (Atomic number 11 to 18): This is also a short period. It contains eight elements (Sodium to Argon).
- **Fourth period** (Atomic number 19 to 36): This is a long period. It contains eighteen elements (Potassium to Krypton). This includes 8 normal elements and 10 transition elements.
- **Fifth period** (Atomic number 37 to 54): This is also a long period. It contains 18 elements (Rubidium to Xenon). This includes 8 normal elements and 10 transition elements.

- **Sixth period** (Atomic number 55 to 86): This is the longest period. It contains 32 elements (Caesium to Radon). This includes 8 normal elements, 10 transition elements and 14 inner transition elements (Lanthanides).
- **Seventh period** (Atomic number 87 to 118): Like the sixth period, this period also accommodates 32 elements. Recently 4 elements have been included by IUPAC.
- Noble gases show no tendency to accept electrons because the outer s and p orbitals of noble gases are completely filled. No more electrons can be added to them and hence their electron affinities are zero.

- Extraction of metal from metal oxide can be categorized into three types.

More reactive metals	Medium reactive metals	Less reactive metals
Na,K,Ca,Mg,Al	Zn,Fe,Pb,Cu	Ag,Hg
Electrolytic reduction of metal oxide into metal	Chemical reduction of metal oxide into metal using coke	Thermal decomposition of metal oxide into metal

- Dilute or concentrated nitric acid does not attack aluminum, but it renders aluminium passive due to the formation of an oxide film on its surface.

Group Number	Family
1	Alkali Metals
2	Alkaline earth metals
3 to 12	Transition metals
13	Boron Family
14	Carbon Family
15	Nitrogen Family
16	Oxygen Family (or) Chalcogen family
17	Halogens
18	Noble gases