



Learning Objectives



At the end of the lesson the students will be able to:

- ◆ acquire the ability to learn about the atoms and molecules.
- ◆ comprehend atomic mass and molecular mass.
- ◆ have information about gram atomic mass and gram molecular mass.
- ◆ perceive the intended meaning of Avogadro's hypothesis of gases.
- ◆ interpret the application of Avogadro's hypothesis.
- ◆ determine the atomicity of a molecule.
- ◆ interpret the relation between vapour density and relative molecular mass.
- ◆ have the facts about the relationship between the volume of a gas and the number of molecules present in it.
- ◆ grasp the idea of mole concept and solve many problems using it.
- ◆ calculate the percentage of composition of a compound.

INTRODUCTION

You have learnt, in your lower classes that matter is around us everywhere. Matter is made of atoms. Curiously the idea of atom was first proposed by the Greek philosophers in the fifth century BC (BCE). But, their theory was more philosophical than scientific.

The first scientific theory of the atom was proposed by John Dalton. Few of the postulates of Dalton's theory about an atom were found incorrect by the later on studies made by J.J. Thomson, Rutherford, Neils Bohr and Schrodinger. In the light of the result of the researches most of the limitations of the Dalton's theory were

removed and a new theory known as the modern atomic theory was put forward. 'The main postulates of modern atomic theory' are as follows:

- ◆ **An atom is no longer indivisible** (after the discovery of the electron, proton, and neutron).
- ◆ Atoms of the same element may have different atomic mass. (discovery of **isotopes** $_{17}\text{Cl}^{35}$, $_{17}\text{Cl}^{37}$).
- ◆ Atoms of different elements may have same atomic masses (discovery of **Isobars** $_{18}\text{Ar}^{40}$, $_{20}\text{Ca}^{40}$).
- ◆ Atoms of one element can be transmuted into atoms of other elements. In other words, atom is no longer indestructible (discovery of **artificial transmutation**).

