## Chapter -01

# Some basic concept of chemistry

**Class –XI** **Sub-Chemistry**

## Importance of Chemistry

Chemistry has a direct impact on our life and has wide range of applications in different fields. These are given below:

**(A) In Agriculture and Food:**

(i) It has provided chemical fertilizers such as urea, calcium phosphate, sodium nitrate, ammonium phosphate etc.

(ii) It has helped to protect the crops from insects and harmful bacteria, by the use ‘ of certain effective insecticides, fungicides and pesticides.

(iii) The use of preservatives has helped to preserve food products like jam, butter, squashes etc. for longer periods.

**(B) In Health and Sanitation:**

(i) It has provided mankind with a large number of life-saving drugs. Today, dysentery and pneumonia are

curable due to discovery of sulpha drugs and penicillin life-saving drugs. Cisplatin and taxol have been found to be very effective for cancer therapy and AZT (Azidothymidine) is used for AIDS victims.
(ii) Disinfectants such as phenol are used to kill the micro-organisms present in drains, toilet, floors etc.
(iii) A low concentration of chlorine i.e., 0.2 to 0.4 parts per million (ppm) is used ’ for sterilization of water to make it fit for drinking purposes.

**(C) Saving the Environment:**

The rapid industrialisation all over the world has resulted in lot of pollution.
Poisonous gases and chemicals are being constantly released in the atmosphere. They are polluting environment at an alarming rate. Scientists are working day and night to develop substitutes which may cause lower pollution. For example, CNG (Compressed Natural Gas), a substitute of petrol, is very effective in checking pollution caused by automobiles.

**(D) Application in Industry:**

Chemistry has played an important role in developing many industrially ^ manufactured fertilizers, alkalis, acids, salts, dyes, polymers, drugs, soaps, detergents, metal alloys and other inorganic and organic chemicals including new

## Properties of Matter and Their Measurements

Physical Properties: Those properties which can be measured or observed without changing the identity or the composition of the substance.

Some examples of physical properties are colour, odour, melting point, boiling point etc.

Chemical **Properties:** It requires a chemical change to occur. The examples of chemical properties are characteristic reactions of different substances. These include acidity, basicity, combustibility etc.

- **Units of Measurement**

**Fundamental Units:** The quantities mass, length and time are called fundamental quantities and their units are known as fundamental units.

There are seven basic units of measurement for the quantities: length, mass, time, temperature, amount of substance, electric current and luminous intensity.

SI system: - In recent years, the scientist have generally agreed to use the International System of Units abbreviated as SI units.

It has given units of all the seven basic quantities listed above.

Table 1.1. Basic Physical Quantities and their Units

| *Basic Physical Quantity* | *Symbol for Quantity* | *Name of SI Unit* | *Symbol for SI Unit* |
|---|---|---|---|
| Length | *l* | metre | m |
| Mass | *m* | kilogram | *H* |
| Time | *t* | second | s |
| Electric current | *i* | ampere | A |
| I hermodvnamic temperature Amount | *T* | kelvin | K |
| of substance | *n* | mole | mol |
| Luminous intensity | *K* | candela | cd |

Mass: Mass of a substance is the amount of matter present in it.

The mass of a substance is constant.

The mass of a substance can be determined accurately in the laboratory by using an analytical

balance. SI unit of mass is kilogram.

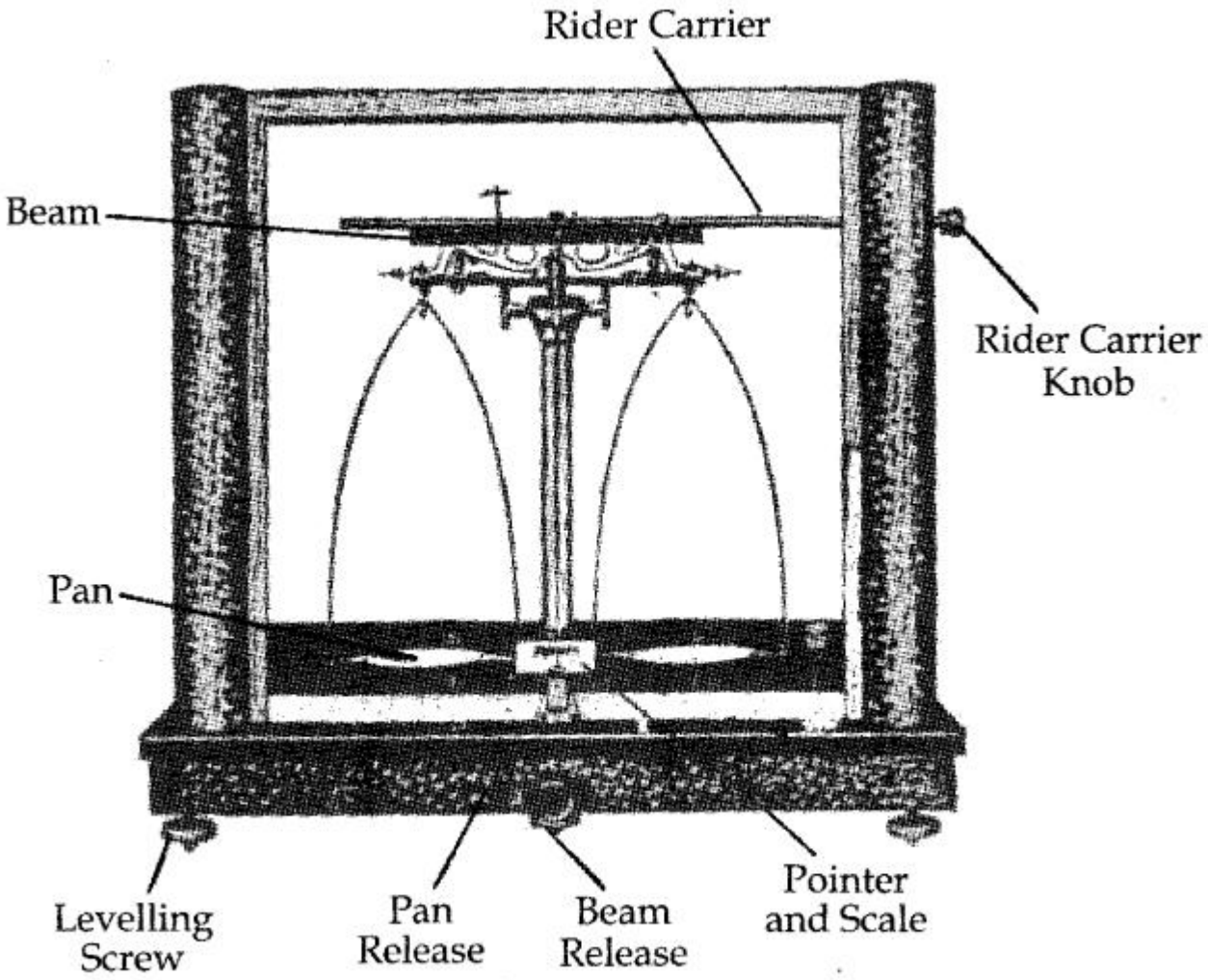


**Fig. 1.1** *Analytical balance.*

Weight: It is the force exerted by gravity on an object. Weight of substance may vary from one place to another due to change in gravity.

Volume: Volume means the space occupied by matter. It has the units of $(length)^3$. In SI units, volume is

expressed in metre$^3$ ($m^3$). However, a popular unit of measuring volume, particularly in liquids is litre (L) but it is not in SI units or an S.I. unit.

Mathematically,

1L = 1000 mL = 1000 cm3 = 1dm3.

Volume of liquids can be measured by different devices like burette, pipette, cylinder, measuring flask etc. All of them have been calibrated.

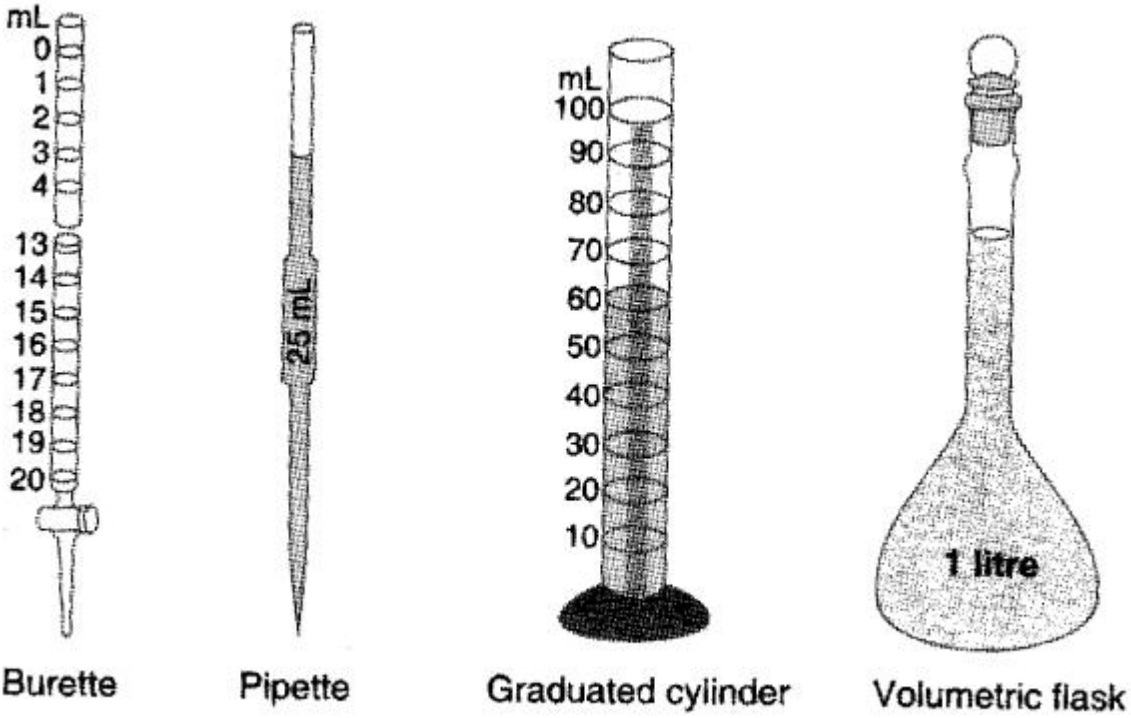


**Fig. 1.2** *Some volume measuring devices.*