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Chapter Summary
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Chemistry

- Chemistry is a branch of science in which we study about composition, structure and properties of matter and the changes it undergoes.
- Learning about matter is, therefore, the first and the most essential step towards learning chemistry.



Matter

- Everything in this universe is made up of matter.
- The air we breathe in, the water we drink, the food we eat, the stars, the plants, the animals and even we are made up of matter.



Matter

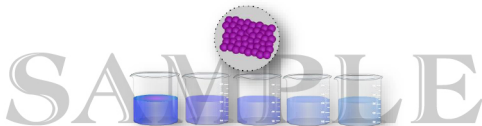
- The early Indian philosophers and ancient Greek philosophers classified matter into five basic elements or *Panch Tatva* namely air, water, earth, sky and fire.
- Today, the scientists have classified matter on the basis of their physical and chemical properties.
- Anything that has mass and occupies space is called matter.

Physical nature of matter

- Every matter is made up of particles.
- In ancient times scientists had two different views about the nature of matter—some believed matter to be continuous and other believed it to be particulate.



Experiments to show particle nature of matter



Dissolution of KMnO_4 in water
(Dissolving solid in liquid)

The same experiment can be repeated with dettol. The smell of dettol can be detected in very dilute solution also.

Characteristics of particles of matter

- Very, very small. These are so small that they cannot be seen with naked eyes.
- Have spaces between them.
- Are continuously moving.
- Attract each other.
- Possess kinetic energy.



Particles of matter have space between them

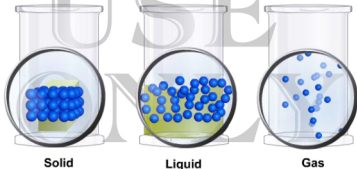
Particles of matter are in continuous motion.

Particles of matter attract each other

States of matter

On the basis of differences in the physical characteristics of the particles of the matter, matter exists in three states.

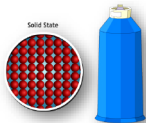
- Solid state
- Liquid state
- Gaseous state



Solid state

The matter in solid state has :

- fixed shape because their particles are very closely packed.
- fixed volume and fixed boundaries due to existence of strong attractive forces between their particles.
- rigid structure.
- very small spaces between the particles and is incompressible.
- no freedom of movement between the particles because of very strong interparticle force of attraction. They can vibrate around their mean position only.
- no property to diffuse into other solids.



Do you know!

- Sponge is solid still it can be compressed because it contains pores in which air is trapped. During compression, air trapped in pores comes out.
- Sugar takes the shape of the container in which it is kept still it is called solid because the shape of the individual sugar crystal remains same.

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