

CHEMISTRY

CLASS NOTES FOR CBSE

Chapter 01. Matter in Our Surroundings

Anything which occupies space and has mass is called matter. Modern day scientists classify matter in two ways : on the basis of its physical properties and on the basis of its chemical properties. On the basis of physical properties matter is classified as solids, liquids and gases. And on the basis of chemical properties, matter is classified as elements, compounds and mixtures.

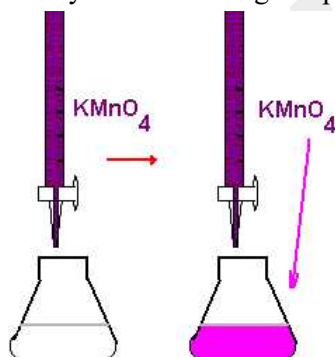
01. Matter is made of particles

Everything around us is made of tiny pieces or particles.

Evidence for Particles in Matter

(i) Dissolving a Solid in Liquid

we will first study the dissolving of potassium permanganate in water.



Actually, on dissolving, the particles of potassium permanganate into the spaces between the particles of the water. Since the particles of potassium permanganate and particles of water spread into each other and mix up on their own, it is concluded that 'they are moving' or 'they are in motion'. If the particles were not moving the colours could not spread throughout the beaker on its own. This movement of different particles among each other (on their own), so that they become mixed uniformly, is called diffusion. We will now discuss the case of sugar dissolving in water. When sugar is added to water and stirred, it dissolves quickly. The sugar seems to disappear. These sugar particles go into the spaces between the particles of water, and mix with them.



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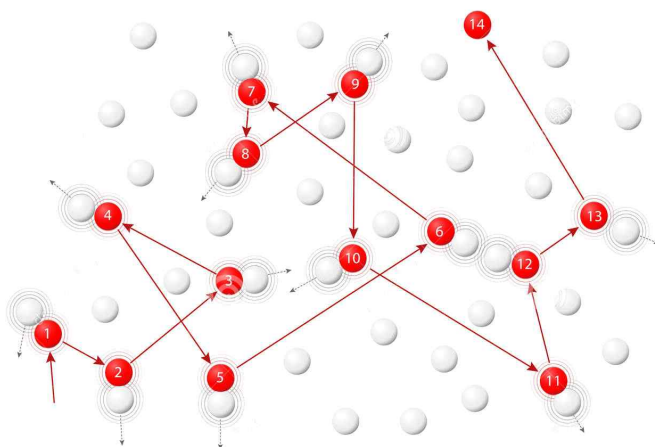
(ii) Mixing of Two Gases

The process of diffusion give us two conclusions about the nature of matter :

- (a) that matter is made up of tiny particles, and
- (b) that the particles of matter are constantly moving.

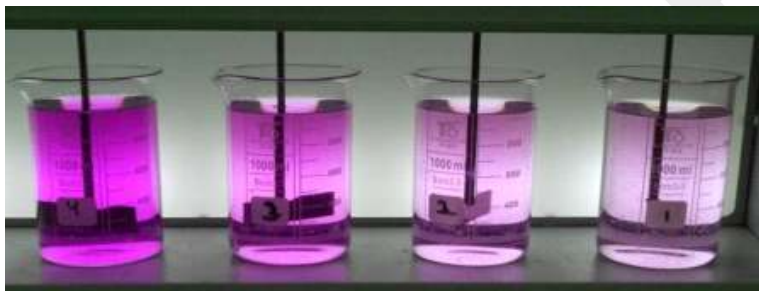
(iii) Movement of pollen Grains in Water

The best evidence for the existence and movement of particles in liquids was given by Robert Brown in 1827. Robert Brown suspended extremely small pollen grains in water. On looking through the microscope. it was found that the pollen grains were moving rapidly throughout water in a very irregular way (or zig-zag way) It was also observed that warmer the water, faster the pollen grains move on the surface of water. The pollen grains move on the surface of water because they are constantly being hit by the fast moving particles of water. The random motion of visible particles (pollen grains) caused by the much smaller invisible particles of water is an example of Brownian motion (after the name if the scientist Robert Brown who first observed this phenomenon. The zig-zag movement of the small particles suspended in a liquid (or gas) is called Brownian motion.)

Brownian motion**Characteristics of Particles of Matter**

The important characteristics of particles of matter (like atoms or molecules are the following:

- (i) **The particles of matter are very, very small**



From this observation we conclude that each potassium permanganate crystal itself must be made up of millions of small particles which keep on spreading and imparting colours to more and more of water (on dilution.)



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