



BAL BHARATI PUBLIC SCHOOL, PITAMPURA, DELHI – 110034

Class- 9

Chemistry

Ch-1: Matter in Our Surroundings

Guidelines

Dear students

- Refer to the content given below and view the links.
- These notes will help you to understand the concept and complete the assignment that follows.
- The assignment is to be done in the Chemistry notebook
- Please read Science NCERT book before you begin to answer the questions.
- Link for Class 9 Science NCERT book:

http://ncertbooks.prashanthellina.com/class_9.Science.Science/CHAP%201.pdf

Sub-Topics

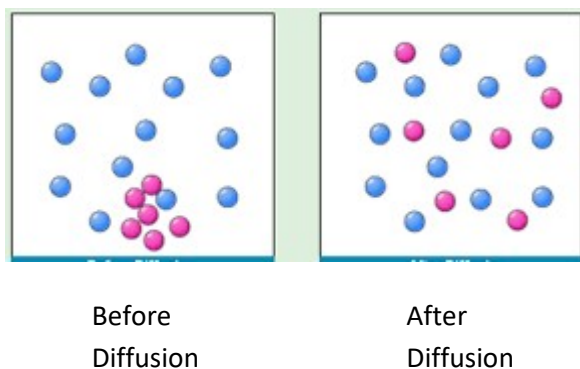
- Diffusion
- Diffusion in different states of matter
- Effect of temperature on the rate of diffusion

Diffusion

- **The intermixing of particles of different types of matter on their own is called Diffusion.**
- Diffusion takes place because of the movement of particles of matter.
- It is a natural process.
- Diffusion takes place in solid, liquid and gases.
- Diffusion is fastest in gases and slowest in solids.
- The rate of diffusion increases on increasing the temperature of the diffusing substance.

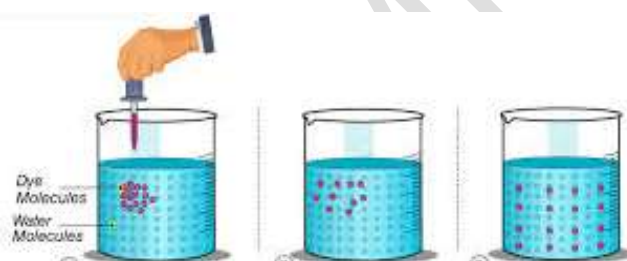
Diffusion in Gases

- Diffusion in gases is very fast.
- The particles of gas have lots of spaces between them. They also have more kinetic energy due to which they move with high speed. Because of the movement of particles with high speed, gas diffuses most rapidly.
- **Example:** When we light an incense stick (agarbatti) in a corner of our room, its fragrance spreads in the whole room very quickly due to the diffusion of its smoke into the air.



Diffusion in Liquids

- The liquids also show diffusion because the particles of liquid are continuously moving.
- However, the rate of diffusion in liquids is less than that of gases. This is because the particles in liquids move slowly as compared to the particles in gases.
- **Example:** When salt is added in water then the whole solution becomes salty after some time. This happens because of diffusion of salt in water.



Diffusion in Solids

- Diffusion can also take place in solids.
- Diffusion takes place at the slowest rate in the case of solids. The rate of diffusion is almost negligible in solids.
- Since the particles of solid have lowest kinetic energy. Hence, diffusion takes long time in the case of solids.
- **Example:** Some time we observe that the marks of chalk on the black board cannot be wiped out easily after a long time. This happens because of the diffusion of particles of chalk with the particles of black-board.
- **From the above discussion, we can conclude that the increasing order of rate of diffusion in 3 states of matter is:**

Solid < Liquid < Gas

Effect of temperature on the rate of diffusion

The rate of diffusion increases with an increase in temperature and decreases with a decrease in temperature.

Diffusion takes place because of the movements of particles of matter. The increase in temperature increases the kinetic energy, which increases the speed of movement of particles of matter. The increase in the speed of movement increases the rate of diffusion.

Example: We do not get the smell of cold food from a distance while we get the smell of hot food from a distance. This happens because smell coming out from the cold food in the form of gas does not have enough kinetic energy to cover more distance. But when food is hot, the vapours coming out from it move more rapidly because of more kinetic energy and reach us even if we are at a distance from it. This shows that temperature increases the rate of diffusion.

For further reference, you may refer to the following links:

<https://www.youtube.com/watch?v=KRLNDTmBFZY> (watch it till 2 minutes)

Assignment

1. Define the term diffusion.
2. Name the process by which an ink drop spreads in a beaker of water.
3. Fill in the following blanks with suitable words:
 - a) The smell of perfume gradually spreads across a room due to _____.
 - b) The rate of diffusion is minimum in _____ state.
 - c) The rate of diffusion decreases with _____ in temperature.
4. Justify the following statements:
 - a) The smell of hot food reaches us several meters away, but to smell the cold food we have to go closer to it.
 - b) The rate of diffusion is fastest in gases.
5. Identify the state of matter which has:
 - a) maximum movement of particles
 - b) maximum interparticle force of attraction
 - c) minimum spaces between constituent particles.
