

Chemistry Study Materials for Class 9 (NCERT Based notes of Chapter -01)

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Date:- 24/04/2021

MATTER IN OUR SURROUNDINGS

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Q1. Convert the following temperature to Celsius scale: a) 300 K b) 573 K.

Answer: (a) $300\text{ K} = (300 - 273)^{\circ}\text{C} = 27^{\circ}\text{C}$

(b) $573\text{ K} = (573 - 273)^{\circ}\text{C} = 300^{\circ}\text{C}$

Q2. What is the physical state of water at: a) 250°C b) 100°C ?

Answer:

(a) Water at 250°C exists in gaseous state.

(b) At 100°C , water can exist in both liquid and gaseous form. At this temperature, after getting the heat equal to the latent heat of vaporization, water starts changing from liquid state to gaseous state.

Q3. For any substance, why does the temperature remain constant during the change of state?

Answer: During a change of state, the temperature remains constant. This is because all the heat supplied to increase the temperature is utilized in changing the state by overcoming the forces of attraction between the particles. Therefore, this heat does not contribute in increasing the temperature of the substance.

Q4. Suggest a method to liquefy atmospheric gases.

Answer: Applying high pressure and cooling a gas to low temperature helps in the

liquefaction of atmospheric gases. The reason is that under such conditions of temperature and pressure, the molecules of gases come closer, their kinetic energy becomes less and the gas is liquefied.

EVAPORATION

The change of liquid into vapor without reaching at its boiling point is called Evaporation. Evaporation takes place only at the surface of liquid while vaporization takes place on the whole mass of liquid.

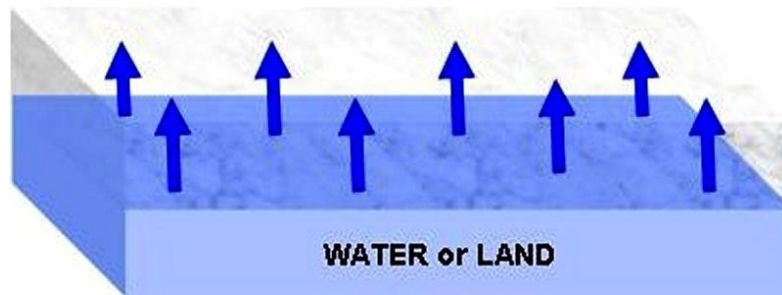
Evaporation takes place even at room temperature also. Evaporation speeds up with rise in temperature.

When water or other liquid is left in open, gradually its volume decreases. If you left some water in a pot in open, after two or three days water disappears. If the water left in garden or in an open balcony, it disappears quickly than kept in a room. This happens because of evaporation.

PROCESS OF EVAPORATION

Molecules at the surface of water, when exposed to some temperature, their kinetic energy increases. Because of increase in kinetic energy those molecules become able to overcome the force of attraction between the particles of liquid. After getting required kinetic energy and decrease in force of attraction, they escape in the air in the form of vapor. Additionally those kinetic energy get some of the required kinetic energy from their neighboring molecules also because of which the temperature of the adjacent molecules decrease, which finally result in decrease of the temperature of surface of liquid.

EVAPORATION CONTINUOUSLY MOVES WATER FROM THE SURFACE TO THE ATMOSPHERE



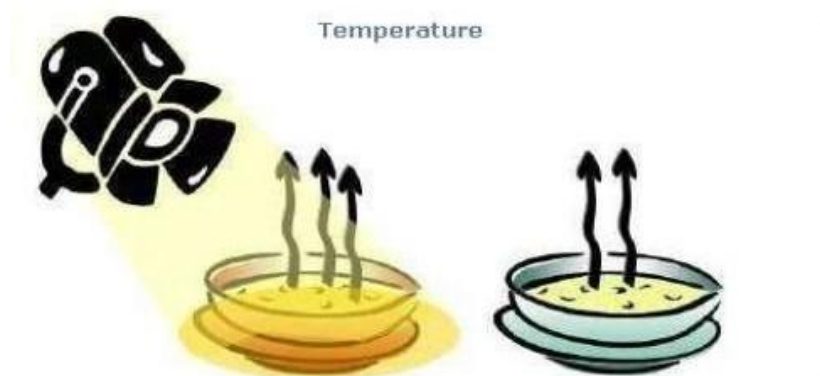
FACTORS AFFECTING THE EVAPORATION

- Temperature
- Pressure
- Surface area
- Humidity in air
- Wind speed

TEMPERATURE

Evaporation increases with increase in temperature and decreases with decrease in temperature. This means rate of evaporation is directly proportional to the temperature.

With increase in temperature the particles of liquid at surface get required kinetic



energy to overcome the force of attraction and escape in air quickly. Hence, the increase in temperature increases the rate of evaporation.

PRESSURE

Evaporation decreases with increase in pressure and increases with decrease in pressure. This means the rate of evaporation is indirectly proportional to the pressure.

Particles at the surface of liquid require more kinetic energy to escape in air when there is more pressure over it and hence rate of evaporation will decrease. While if there is less pressure over the surface of liquid, the particles would require less kinetic energy to escape in air and hence rate of evaporation will increase. Therefore, increase in pressure slows down the rate of evaporation and decrease in pressure speeds up the rate of evaporation.

