# Hygrometry

## Saturated and unsaturated vapour

### Saturated vapour

Can't hold more liquid molecules at given condition and does not follow gas law.

### Unsaturated vapour

Can hold more liquid molecules at given condition which follow gas laws.

### Effect of volume on saturated vapour

The saturated vapour at given volume then on increasing volume it become unsaturated and on decreasing volume vapour remain saturated giving out more liquid molecules.

### Effect of temperature on saturated vapour

When the temperature of saturated vapour increases then it become unsaturated and on decreasing temperature it remain saturated giving out more liquid.

## Effect of pressure

a. On melting point
   1. Melting point of a body decreases on increasing pressure if volume decreases on melting E.g. ice
   2. Melting point of body increases on increasing pressure if volume increases on melting E.g. Wax.

b. On boling point
   Liquid boil if the total pressure on it's surface become equal to the saturated vapour pressure so the boiling point increases on increasing pressure.

## Triple point

Point on *P-T* diagram at which *3* states of matter i.e. *solid, liquid and gaseous* state coexist, fusion curve, sublimation curve & vaporization curve meet. It is standard point in thermometry since it is unique. It's value is *4.58mm of Hg* pressure & *273.15k* temperature for water and *5.11 atm* pressure & *- 56.6° C* temperature for carbon dioxide.

## Evaporation

Process of escaping liquid molecules form its surface by taking energy from surrounding molecules cooling is observed after evaporation and takes place at all temperature and which stop if vapour is saturated.

## Humidity

Presence of water vapour in air is called humidity. It is divided as

a. Absolute humidity
   Mass of water vapour present in unit volume of air is called absolute humidity.

b. Relative humidity (RH)
   Ratio of mass of water vapour present in certain volume of air and mass of water vapour required to saturate it at same condition.

$$\therefore \text{ Relative humidity (RH)} = \frac{m}{M} \times 100\%$$

m = mass of water vapour present
M = mass of water vapour required to saturate.

**Dew point**
It is the temperature at which water vapour present in atmosphere is just sufficient to saturate it. Mass of water vapour present in atmosphere is directly proportional to saturated vapour pressure *(svp).*

$$\therefore \frac{m}{M} = \frac{p}{P}$$

Where,
p = svp at dew point
P = SVP at room temperature

$$\therefore RH = \frac{m}{M} \times 100\% = \frac{p}{P} \times 100\%$$