

## **Determination of Humidity of Air (By Dew Point and Psychrometric Methods)**

**Aim:** To determine the humidity of air using dew point & Psychrometric methods.

**Requirements:** Psychrometer, Thermometers, Cotton, Copper vessel, Humidity chart, etc

**Principle:** Humidity is defined as pounds of water vapour carried by one pound of dry air under any given set of conditions. The temperature at which air becomes saturated is the wet bulb temperature. At this temperature air is equilibrium with water.

In dew point method, the dew is found on the walls of container at the temperature, where the air is in contact with it, and gets saturated.

In psychrometric method both the dry bulb and wet bulb temperatures are determined. By determining the wet bulb temperature, humidity of dry air and relative humidity can be calculated with the help of humidity chart.

### **Procedure:**

**Dew point method:** Take a copper vessel and fill it with water up to 1/3<sup>rd</sup> of vessel. The walls of the vessel should be maintained dry. Add crushed ice pieces and slowly stir continuously until the ice melts. Add the ice pieces and continue the process gradually until mist just starts forming on the walls of the copper vessel. Note the temperature with the help of a thermometer. This point is called as “**dew point**”.

**Psychrometric method:** in this method, collect Psychrometer & note the temperature in the thermometer initially. It is the dry bulb temperature. Now pack the bulb of one of the thermometer with wet cotton and rotate the Psychrometer until there is no further change in the temperature of the thermometer, which is packed with wet cotton. This is noted as the wet bulb temperature. Using humidity chart, the dry bulb humidity is obtained and then relative humidity is calculated by using the following equation:

$$W_w - W_g = (h_G / k_G M_G P) (1/\lambda_w) (t_G - t_w)$$

$W_w$  = Humidity of wet bulb temperature

$W_g$  = Humidity of dry bulb temperature

From exp. measurements, for water ( $k_G M_G P$ ) = 0.26

$\lambda_w$  = Latent heat of water at wet bulb temperature

$t_w$  = Wet bulb temperature

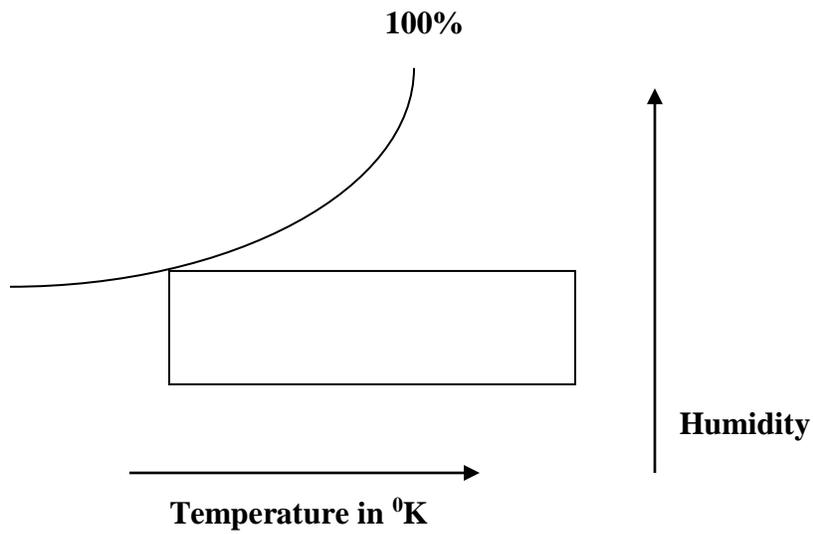
$t_G$  = Dry bulb temperature

### **Observations:**

By dew point method:

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S.No	Initial temperature		Dew point temperature	
	In °C	In °F	In °C	In °F
1				
2				
3				
4				
5				




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**Report:**

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