

## B.Sc. I - (H) IA - PAPER

Enthalpy or Heat content -

Enthalpy of a system ( $H$ ) is mathematically defined as

$$H = E + PV \quad \text{--- (i)}$$

Where  $E$  is the internal energy,  $P$  is pressure and  $V$  is the volume of the system. Enthalpy is a state function and it can not be measured directly but change in enthalpy is measured from final and initial enthalpy of the system.

If  $H_2$  is the enthalpy of the ~~system~~ final state and  $H_1$  is the enthalpy of initial state then

$$H_1 = E_1 + PV_1 \quad \text{--- (ii)}$$

$$H_2 = E_2 + PV_2 \quad \text{--- (iii)}$$

$$\text{or } H_2 - H_1 = E_2 - E_1 + P(V_2 - V_1)$$

$$\text{or } \Delta H = \Delta E + P\Delta V \quad \text{--- (iv)}$$

Here  $\Delta H = H_2 - H_1$  is the change of the system. Hence enthalpy change of the system is equal to the heat absorbed.

by the system at constant pressure.

Hence the change of enthalpy may also be defined as the sum of the increase in internal energy of the system and the pressure-volume work done i.e. work of expansion. Enthalpy is also called the heat content of the system.

Significance of enthalpy or heat content —

~~Ex~~ Every substance or system has some definite energy stored in it, is called internal energy. The energy ~~content~~

stored within the substance or the system that is available for conversion ~~of~~ into heat is called the heat content or Enthalpy of the substance. Absolute heat content of the system can not be measured directly. In thermodynamic process, we are concerned with only change in enthalpy which can be measured experimentally.

