Class B.Sc Semester IIIrd.

Subject - Physical Chemistry

Topic Name :→ Thermochemistry.

Thermochemistry is the branch of physical chemistry which deals with the thermal or heat changes cause by chemical reactions.

we have studied in the pervious Chapter that every substance has a definite amount of energy known as the intrinsic energy or internal energy E. Its exact value cannot be determined but the change in intenal energy ΔE can be accurately measured experimentally

When the internal energy of reactants (E_r) is greater than the internal energy of the products (E_p) the difference of internal energy, ΔE is released as heat energy.

$$\Delta E = E_{products} - E_{reactants}.$$

$$\Delta E = E_p - E_r.$$

Enthalpy of a reaction.

Thermochemical measurements are made either at (a) Constant volume or (b) Constant pressure. The magnitude of changes observed under the two conditions are different.

The change in internal energy (ΔE) is the heat change accompanying a chemical reaction at constant volume

because no external work is performed.

However at constant pressure not only does the change in internal energy take place but work is also involved because of expansion or or contraction.

The enthalpy of a system is defined as the sum of the internal energy and the product of its pressure and volue.

That is

$$H = \varepsilon + pv.$$

where ε is the internal energy, p is the pressure and v is the volume of the system. It is also called Heat content.