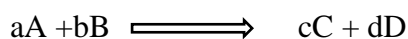


Heat absorbed at constant volume is equal to change in internal energy, ΔU and heat absorbed at constant pressure is equal to change in enthalpy, ΔH . Change in internal energy is measured using a bomb calorimeter. A steel vessel, generally called a bomb is immersed into water bath to prevent any kind of heat loss. The calorimeter is sealed and a combustible matter is placed inside the vessel and reaction is happening at constant volume. The heat evolved is monitored and this is the ΔU .

Enthalpy of a reaction:



$$\begin{aligned}\Delta_{\text{rxn}}H &= \sum a_j H_{\text{products}} - \sum a_i H_{\text{reactants}} \\ &= cH_C + dH_D - (aH_A + bH_B)\end{aligned}$$

Standard condition:

The standard state of a substance at a specified temperature is its' pure form at 1 bar pressure. Usually, the specified temperature is taken as 298K (or 25 °C).

The standard enthalpy of a reaction is the enthalpy change when all reactants and products are at their pure state.

Unit of standard heat of reaction: J/mol. Even if the unit is in per mole basis, this depends on the stoichiometry of the balanced chemical equation.

Example:

At 298 K;

