

Thermodynamics

01
09/04/2020
(continued)

Prof. Ashok

Dept. of Chemistry
S.N.S.R.K.S. College
Sachin

Kelvin - Planck - statement of second Law of Thermodynamics:-

It is impossible to construct a device operating in a cycle that will produce no effect other than extraction of heat from a single reservoir and convert all of it into work.

Reversible and Irreversible process

A process is reversible with respect to the system and surroundings. If the system and surroundings can be restored to their respective initial states by reversing the direction of the process that is by reversing the heat transfer and work transfer. The process is irreversible if it cannot fulfill this criteria.

Enthalpy →

Enthalpy is a thermodynamic property of a system. It is the sum of the internal energy added to the product of the pressure and volume of the system. It reflects the the capacity to do non-mechanical work and the capacity to ~~release~~ release heat. Enthalpy is denoted as H .

$$\text{So } H = E + PV$$

where H = Enthalpy

E = is the energy

PV = is the pressure multiplied by ~~the~~ volume.

So, Enthalpy is a measure of heat content where as Entropy is the measure of change in (enthalpy/temperature)

Isothermal and adiabatic process

Isothermal process are those process which cause change in the system in such a way that the temp. of the system remain constant.

There are millions of

Process which cause some kind of change in the system. But the process which cause some change in the system specifically at a constant temperature are termed as isothermal process. which means that there will be no change in the temperature and $\Delta T = 0$ (symbol Δ delta represent change)

For example: All the reactions going in the refrigerator are isothermal as a constant temperature is maintained in it. The melting of ice at 0° is an example of isothermal process.

An adiabatic process occurs without transferring heat or mass between a thermodynamic system and its surroundings. Unlike an isothermal process and adiabatic process transfers energy to the surroundings only as work.

An example of an adiabatic process is the vertical flow of air in the atmosphere. Air expands

04
03/04/2020

and cools as it rises and contracts and grows warmer as it descends. Another example is when an interstellar gas cloud expands or contracts. Adiabatic changes are usually accompanied by changes in temperature.

Continued