THERMODYNAMICS-I

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Thermodynamics

- Branch of science that deals with transformation of energy is called as Thermodynamics.
- Thermodynamics acts as a base of physical chemistry.

Basic terms of Thermodynamics

- System :

  The part of universe which is under is under observation for thermodynamic studies is called as system. It is separated from other part of universe by specific boundaries.

For eg. A beaker in which some reaction is taking place can be considered as a system.

- Surrounding:

The part of universe excluding the system is called as surroundings.

For eg ,the entire universe except the beaker in which reaction is carried out is considered as surroundings.

Types of system

1. Open System :

   The system which can exchange energy as well as matter with surrounding is called as open system.

2. Closed System :

   The system which can exchange energy but not matter with the surroundings is called as closed system.

3. Isolated System :

   The system which can neither exchange energy nor matter with the surroundings is called as isolated system.

Properties of System

1. Extensive Properties :

   The properties of the system whose values depend upon the amount of the substance present in the system are called as extensive properties.

For eg. – volume, mass, internal energy , number of moles, enthalpy, entropy, free energy etc.

2. Intensive Properties :

The properties of the system whose values are independent of the amount of substance present in the system are called as intensive properties.

For eg : temperature, pressure, density, refractive index , viscosity, surface tension etc.

Thermodynamic processes

1. Isothermal process :

   The process carried out at constant temperature is called as isothermal process. In isothermal process, the system can exchange heat with surroundings in order to keep the temperature constant.

2. Adiabatic process :

   The process in which exchange of heat does not take place with the surroundings is called as adiabatic process. Such process requires isolated system.

3. Isobaric process :

The process carried out at constant pressure is called isobaric process. Such process may be accompanied by change in temperature and / or volume .

4. Isochoric process:

The process carried out at constant volume is called isochoric process. Such process may be accompanied by change in temperature and / or pressure .

5. Cyclic process :

The process in which the system comes back to its initial state after a number of changes is called a cyclic process.

6. Reversible process :

The process which is carried out infinitesimally slowly and the direction can be reversed at any stage by slightly changing the conditions is called a reversible process.

7. Irreversible process :

The process which occurs relatively fast and its direction can not be reversed by slightly changing the conditions is called as irreversible process

Thank

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