Specific Heat Capacity (c) :-

The quantity of heat transfer required for raising or lowering the temperature of unit mass of the substances through one degree.

SI unit = J/kgK.

When the volume is kept Const (c_v) is called specific heat capacity at const volume.

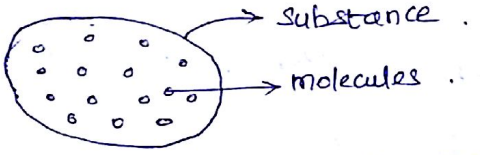
$$Q = m C_v (T_2 - T_1)$$

When the pressure is kept constant is called specific heat capacity at constant pressure (C_p).

$$Q = m C_p (T_2 - T_1)$$

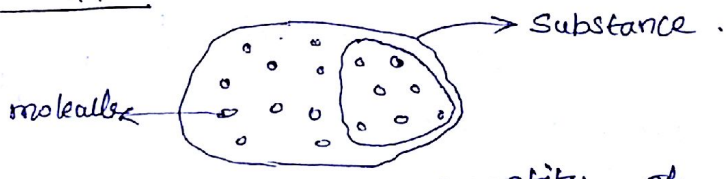
Comparison of Microscopic & Macroscopic Approach.

Microscopic Approach :-



The matter is composed of myriads of molecules. If it is gas, each molecule at a given instant has a certain position, velocity & energy for each molecule these change are very frequent as a result of collision. Thus the behavior of the gas is described by summing up the behavior of each molecule is called microscopic (or) statistical approach.

Macroscopic Approach :-



In this certain quantity of matter is considered, without the event occuring at the molecular level being taken into account. (or) The behaviour of the total system are studied in term of pressure, volume, temperature etc. These properties at every instant can measured easily.

Concept of Continuum :-

A continuum homogenous molecules is called as continuum. It is based on the macroscopic approach.

phase ← solid, liquid, gas

Homogenous – A system consisting of single phase.

Heterogenous – A system consisting of more than one phase.

We are always concerned with volumes which are very large compared to molecules dimensions. Even a very small volume system is assumed to contain a large number of molecule. So that statistical averaging is meaningful. Disregarding the behaviour of individual molecules. The matter is treated as a continous here.

Thermodynamic Properties :-

Property :-

To receive, store & delivers energy a working substance is present within the system. The characteristic which can be used to describe the condition of the system are known as properties.

1. Intensive
2. Extensive.

Eg: Temperature, Pressure, volume, etc.

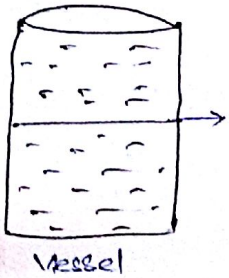
Intensive Property – Does not depend on mass. (or) independent of the mass of the system.

eg: Pressure, Temperature, & Volume.

Extensive Property – Dependent upon the mass of the system.

eg: mass, volume, etc.

Example :-



Volume is reduced two half, it is extensive.

Pressure, temperature remains same It is intensive.