A.G & S.G Siddhartha Degree College of Arts & Science, Vuyyuru

Academic Year 2020-21

1.NAME OF THE EVENT: GUEST LECTURE

- Topic: **Thermodynamics"**
  Date Conducted: 19-02-2021.
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- Name and Designation of the Resource person:
  D.VimalaKumari, Lecturer in Chemistry, ANR College, Gudivada
  .
- **Report on the guest lecturer:**

Objectives

The first law of thermodynamics-statement, definition of internal energy and enthalpy.Heat capacities and their relationship. Joule-Thomson effect- coefficient

Notes on lecture

What is Thermodynamics? Thermodynamics in physics is a branch that deals with heat, work and temperature, and their relation to energy, radiation and physical properties of matter. To be specific, it explains how thermal energy is converted to or from other forms of energy and how matter is affected by this process

Homogeneous System: A system is said to be homogeneous when all the constituents present is in the same phase and is uniform throughout the system.
For example: A- mixture of two miscible liquids.
Heterogeneous system: A mixture is said to be heterogeneous when it consists of two or more phases and the composition is not uniform.
For example: A mixture of insoluble solid in water. '
The state of the system: The state of a thermodynamic system means its macroscopic or bulk properties which can be described by state variables: Pressure (P), volume (V), temperature (T) and amount (n) etc.
They are also known as state functions.
Isothermal process: When the operation is carried out at constant temperature, the process is said to be isothermal. For isothermal process, dT = 0 Where dT is the

change in temperature.

Adiabatic process: It is a process in which no transfer of heat between system and surroundings, takes place.

Isobaric process: When the process is carried out at constant pressure, it is said to be isobaric. i.e. $dP = 0$

Extensive property

An extensive property is a property whose value depends on the quantity or size of matter present in the system.

For example: Mass, volume, enthalpy etc. are known as extensive property.

• Intensive property

Intensive properties do not depend upon the size of the matter or quantity of the matter present in the system.

For example: temperature, density, pressure etc. are called intensive properties.

• Heat capacity

The increase in temperature is proportional to the heat transferred.

$q = \text{coeff.} \times \Delta T$

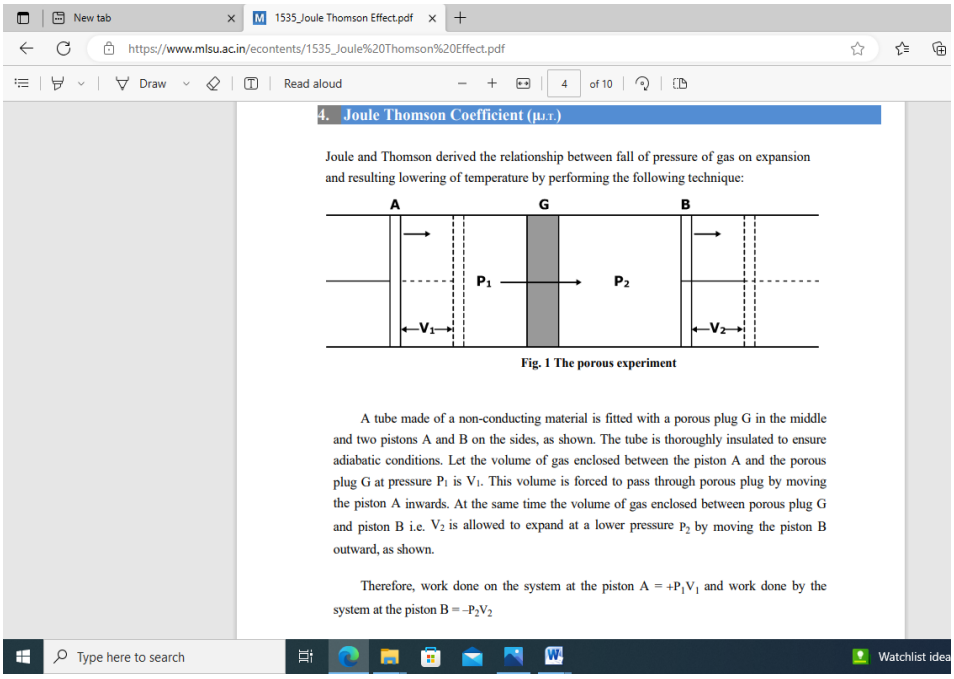
$q = C\Delta T$

Where, coefficient C is called the heat capacity.

C is directly proportional to the amount of substance.

$C_m = C/n$

It is the heat capacity for 1 mole of the substance.



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4. Joule Thomson Coefficient ($\mu_{J.T.}$)

Joule and Thomson derived the relationship between fall of pressure of gas on expansion and resulting lowering of temperature by performing the following technique:

Fig. 1 The porous experiment

A tube made of a non-conducting material is fitted with a porous plug G in the middle and two pistons A and B on the sides, as shown. The tube is thoroughly insulated to ensure adiabatic conditions. Let the volume of gas enclosed between the piston A and the porous plug G at pressure P_1 is V_1. This volume is forced to pass through porous plug by moving the piston A inwards. At the same time the volume of gas enclosed between porous plug G and piston B i.e. V_2 is allowed to expand at a lower pressure P_2 by moving the piston B outward, as shown.

Therefore, work done on the system at the piston A = $+P_1V_1$ and work done by the system at the piston B = $-P_2V_2$

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Outcome

Lecture was received by all third B.Sc Students Impressively. And they get knowledge on Thermodynamics.

PHOTOS

Introduceing Guest

Power point presentation

Signature of HOD