Name :- Patel Arvind Rajkumar

Email ID :- arvinrajsun1999@gmail.com

Subject :- Thermal Physics

Title :- Temperature Differential Force

Abstract:-

In this research I have given Hypothesis and formulas of Temperature Differential Force and law of increase or loss.

Introduction:-

We know that When systems with different temperatures are kept in contact with each other then the heat transfers between them. This transfer of heat takes place until the their temperature is uniform.

The time taken in the transfer of heat between different systems varies. So we can conceive that a force works on them which are responsible for the transfer of heat. This force is called as an Temperature Differential Force. This temperature differential force is a new hypothesis, which works differently inside different systems.

Research Methodology (Process) And Diagram:-

Transfer of heat between any two systems does not depend only on the difference in temperature Rather it depends on the properties of absorption or emission of those systems. If the systems do not have the properties of heat absorption or emission Even if there is difference in temperature, they do not transfer heat.

When systems with two different temperatures are kept in contact with each other than the properties of emission become functional in a system with higher temperature and the properties of absorption in the system with lower temperature becomes functional.

The system emits heat towards the system with low temperatures due to its emission properties and the another system absorbs that emitted heat due to its absorption properties.

Any system absorbs or emits the heat equivalent to its absorption capacity or emission capacity.If the system is given heat from outside or taken from it than physical or chemical changes occur in that system.(If it is more than its absorption or emission capacity)

When two different temperature systems are kept in contact with each other and the property of emission in one of these systems and the absorption properties of the another system is active then one force becomes active for the transfer of heat in that entire system, which is called Temperature Differential Force.

This force is activated until the differences in temperatures between those systems are finished and The property of the emission of one of those two systems and the property of absorption of the other system is active. If the difference between the temperature of the two systems and The property of the emission of one of those two systems and the property of absorption of the other system is exhausted than this force also ends.

Due to the absorption or emission properties of the body, a force works on heat, which causes heat transfer. This force is called Temperature Differential Force.

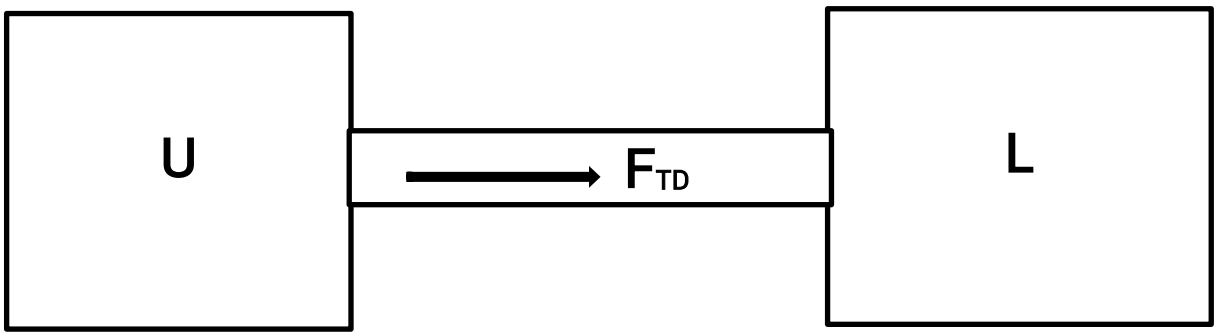
In some two systems, there is a difference in their temperature, then this force works inside those two systems, by which heat is transferred to those systems.

This force is active till then Unless there is a difference of temperature between those systems. This force also ends as soon as this different ends.

Temperature Differential Force working inside two systems are proportional to the difference of temperature of those systems and inversely proportional to time for transfer of heat. I.e.

$$F_{TD} \propto (\theta_U - \theta_L)/t$$

Where θ_U and θ_L are respectively the temperature of system U and L, $\theta_U > \theta_L$ and t is the time for transfer of heat between those two systems U and L.



$$F_{TD} = k_{TD}(\theta_U - \theta_L)/t \quad (N)$$

Where k_{TD} is the temperature differential coefficient.

$$k_{TD} = nK$$

Where n is a second constant whose value is 1 and dimension is $[T^2]$. K is the thermal conductivity coefficient of the joint systems.

$$k_{TD} = K \quad \text{.....(where keeping n= 1)}$$

Now the Thermal conductivity coefficient of the joint system

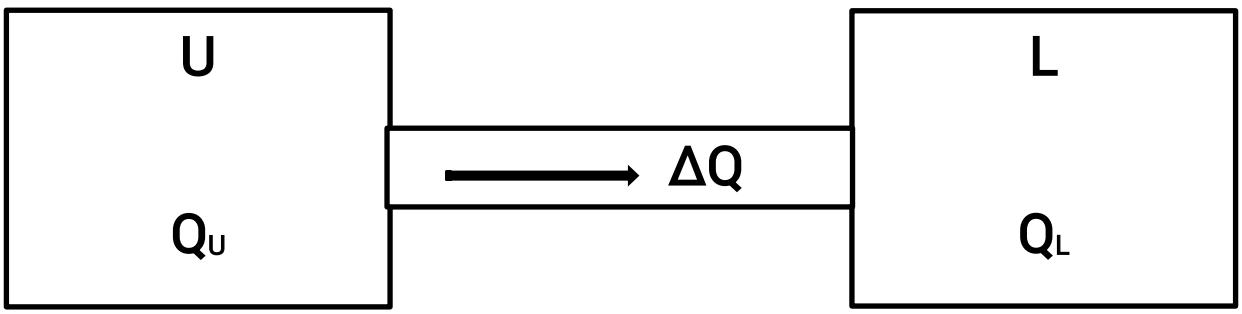
$$K = (2K_UK_L)/(K_U+K_L)$$

Where K_U and K_L respectively is the Thermal conductivity coefficient of system U and L.

$$F_{TD} = nK(\theta_U - \theta_L)/t \ \ (N)$$

$$F_{TD} = [(2K_UK_L/K_U+K_L)(\theta_U - \theta_L)]/t \ \ (N)$$

Heat transfer between two systems is due to this force. If the heat transfer was due to only the difference of temperature, then the heat transfer should be done due to the temperature difference in two ideal clever substances, but this is not the case.



Due to this force or difference of temperature, the increase or loss of heat of a system is equal of difference to Average of initial heat of both systems and the initial heat of that system. I.e

$$\Delta Q_N = [(Q_U+Q_L)/2] - Q_N$$

Where N = U or L and ΔQ_N is increase and loss in heat.

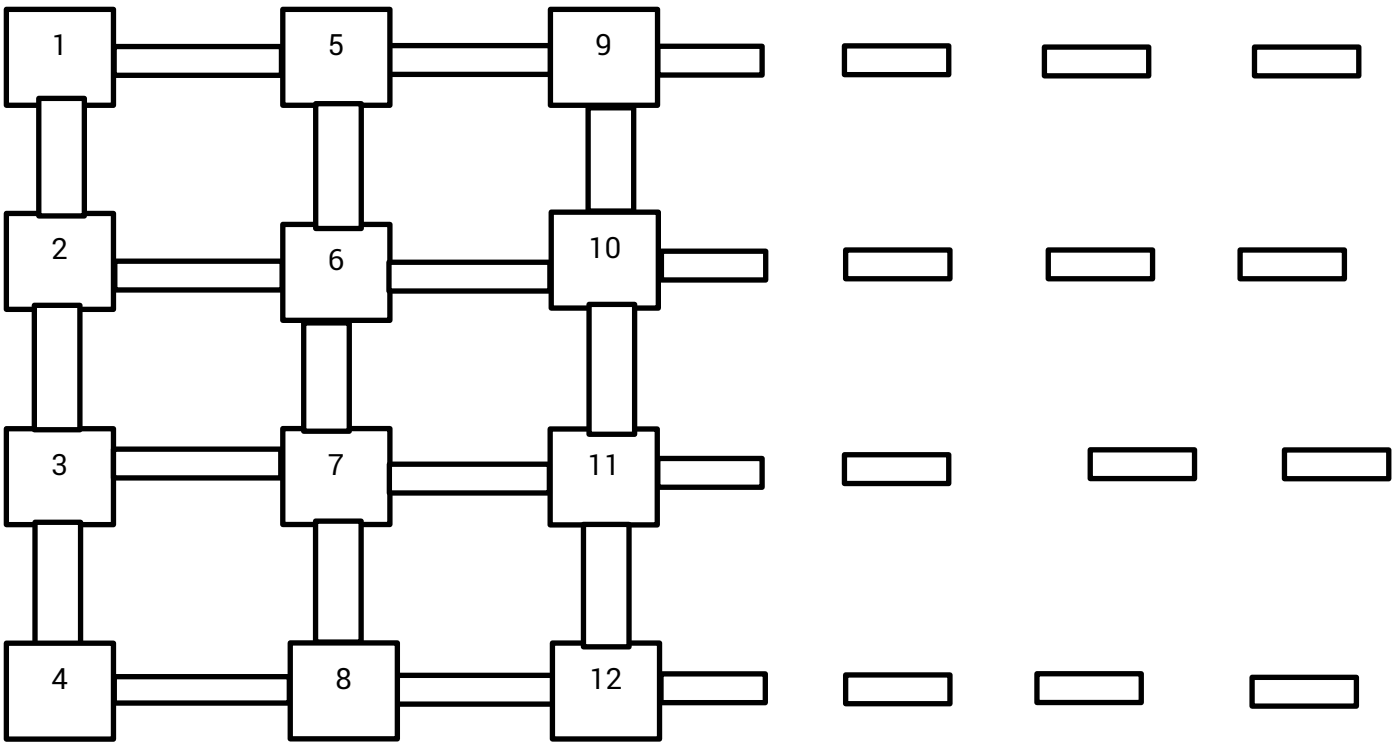
If ΔQ_N is negative then the heat of the system will be in loss and If ΔQ_N is positive then the system heat will increase.

When heat is transferred between systems with different temperatures Then, after

the transfer, increase or loss in the heating of any system is equal of difference to average of initial heat of all systems and the initial heat of that system. I.e.

$$\Delta Q_N = Q_A - Q_N$$

Where N is the system whose heat has increased or lossed, Q_A is the average heat of the all system and Q_N is the initial heat of the system. This law is called **law of increase or loss.**



In figure,

$$\Delta Q_N = [(Q_1+Q_2+Q_3+.....)/n] - Q_N$$

$$\Delta Q_N = Q_A - Q_N \quad .....[(Q_1+Q_2+Q_3+.....)/n = Q_A]$$

Where N = (1,2,3,4,.....), n is sum of all systems and Q_A is the average heat of the all systems.

This increase or loss in the heat produced in different systems is possible due to the absorption and emission properties of those systems.

Condition:- Not all systems will absorb heat from the external environment nor will they emit heat.

Conclusion:- In this research I have given Hypothesis and formulas of Temperature Differential Force and law of increase or loss.

Reference:- No sentences have been copied in this research paper.