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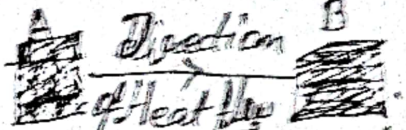
Second law of thermodynamics :-

The essence of

the first law of thermodynamics is that all the physical process occur in such a way that the total energy of the system and surroundings is constant. This law did wonders to the world law as no transformation has violated the principle of conservation of energy. The first law of thermodynamics has one limitation. It does not give any information about the direction of the flow of heat energy. For example of two system A and B. which are capable of exchange



giving heat, are brought in contact with each other then the first law of thermodynamics will only tell us that ~~heat will flow~~ one system loses the energy and the other system gains the same amount of energy.

However the law fail to tell whether the heat will flow from system A to B. In order to predict the direction of the flow of the heat, one more parameter i.e temperature is required

The heat energy actually flows

from a system that is at a higher temperature to the colder body. The process continues till both the system attain the same temperature i.e., the the thermal equilibrium state. The first law of thermodynamics though fails to answer why heat energy does not flow from a cold system to a hot system, though the energy is conserved in this way as well. That's where the second law of thermodynamics comes into the picture which states that the heat can flow spontaneously from a hot object to a cold object, heat will not flow spontaneously from a cold object to a hot object.