the general science journal

Thermodynamics laws, Entropy and CPH Theory

Hossein Javadi
Azad University,Tehran,Iran
Javadi_hossein@hotmail.com

Introduction
Thermodynamics laws and entropy had developed in 19^{th} century successful (see Appendix). Let's take a new at thermodynamics laws and entropy according the CPH theory in this article.

Heat energy in CPH theory
In CPH theory, energy is same as matter with high speed. In the other word, energy moves with speed of light c, and matter moves with speed of v, that $v<c$. So, speed of heat is c, too, because it is a kind of energy. According to the CPH theory, everything is made of CPH, and a CPH has constant energy equal:

$$E_{CPH}=T+S$$

Here T is transferring energy and S is spinning energy of a CPH. So, temperature of a system such as a gas depends to T of CPH in system. When a system takes heat, in fact transferring energy of CPH (that system is made of them) increase.

$$V_{CPH}=V+V_S=\text{Constant}$$

$$E_{CPH}=T+S=\text{Constant}$$

Total energy of a CPH is constant

When spin of CPH converts to transferring movement, the temperature of system increases.
Consider to a flaring ingle, matter converts to energy and in flame CPH move with speed of light. In following figure, CPH leave matter and convert to electromagnetism energy and move with speed of light.

Speed of CPH is v in gas, and they move with speed of c in flame.

According to the CPH theory mass and energy are made of CPH, mass moves with speed v that $0 \leq v < c$ and energy moves with speed c, and when v=c, mass has convert to energy.
For example suppose a system contains two molecules A and B that they are moving with speed v_1 and v_2. Also, molecule A is made of n_1 CPH and molecule B is made of n_2 CPH. So, momentum of system given by;

$$n_1 m_{CPH} V_1 + n_2 m_{CPH} V_2 = (n_1 + n_2) m_{CPH} V$$

Now suppose q calorie is made of k CPH that they move with speed c. When q calorie heat energy enters to system, the momentum of system changes that is given by;

$$k\, m_{CPH} \mathbf{c} + (n_1 + n_2) m_{CPH} V = (k + n_1 + n_2) m_{CPH} V'$$

Suppose a system of gas contains k' molecules. And k' molecules is made of n CPH that they are moving with average velocity v. if n' CPH (heat energy) enter into system, then average velocity of molecules to $\overline{\mathbf{V}}$ that is given by;

$$\overline{V} = \frac{n m_{CPH} \mathbf{v} + n' m_{CPH} \mathbf{c}}{n m_{CPH} + n' m_{CPH}}$$

k' molecules are made of n CPH and heat is made of n' CPH

When a system emits heat energy, average velocity of molecules decreases that is given by;

$$\overline{V} = \frac{n m_{CPH} \mathbf{v} - n' m_{CPH} \mathbf{c}}{n m_{CPH} + n' m_{CPH}}$$

How a charge particle emits electromagnetic wave?

As we know when a charge particle oscillates, it emits electromagnetic energy. Also, a charge particle moves with constant velocity never emits electromagnetic energy.

According to the CPH theory when a charge particle accelerates, then it emits electromagnetic energy. Whine a force works on an electron (if W is not zero);

$$W=dE=\Delta mc^2$$

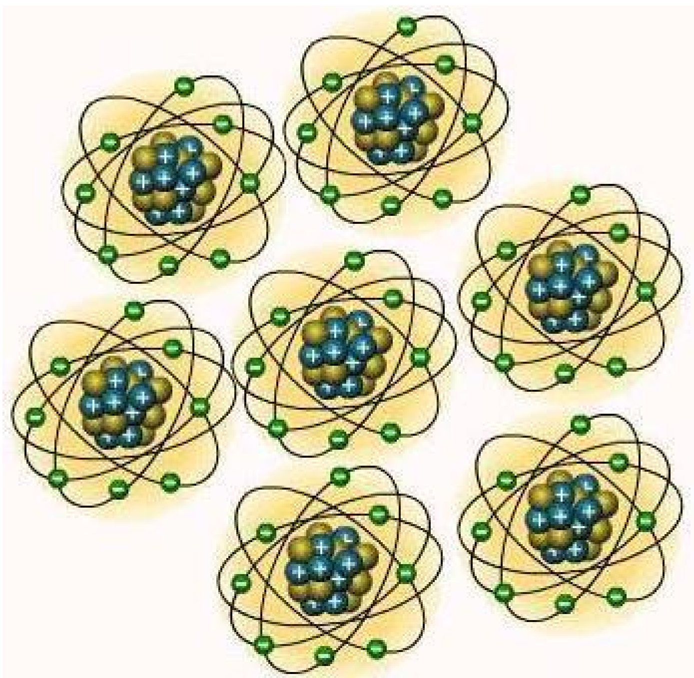
$$W_{(\text{on charge particle})}=E$$

$$W=0 \Rightarrow E=0$$

So, emitting of a charge particle depends to its accelerating.

Why a system emits heat energy?

A system such as gas is made of molecules or atoms, and atoms are not at static state in system. They are moving or oscillating around each other. Also, atoms are made of charge particles, and they absorb or repel each other (see following figure). So, they are working on each other continuously.



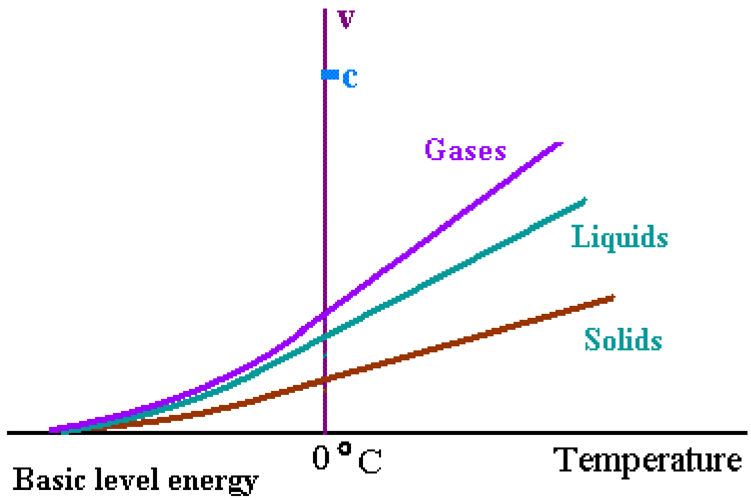
Atoms are made of charge particles that they are moving around each other in a system.

In a system charge particles work on each other and according to above section they emit electromagnetic energy. So, every system emits heat energy, and intensity of radiation is depending to its temperature.

Basic level energy of Fundamental particles

In CPH theory everything (All fundamental particles) is made of CPH. So, a moving particle has two kinds of CPH, one kind made particle and other kind gives its energy. A moving particle is able to loses its

energy without loses itself properties. How we can define "Basic level energy of a fundamental particle" such as electron?
CPH theory's definition of basic level energy of a fundamental particle is based on their properties. A fundamental particle such as an electron has a few properties that does differ it from other particles. If an electron loses one of these properties, then it is not an electron. If a fundamental particle loses all its energy, without losing itself substantial properties, then it is at basic level of energy.



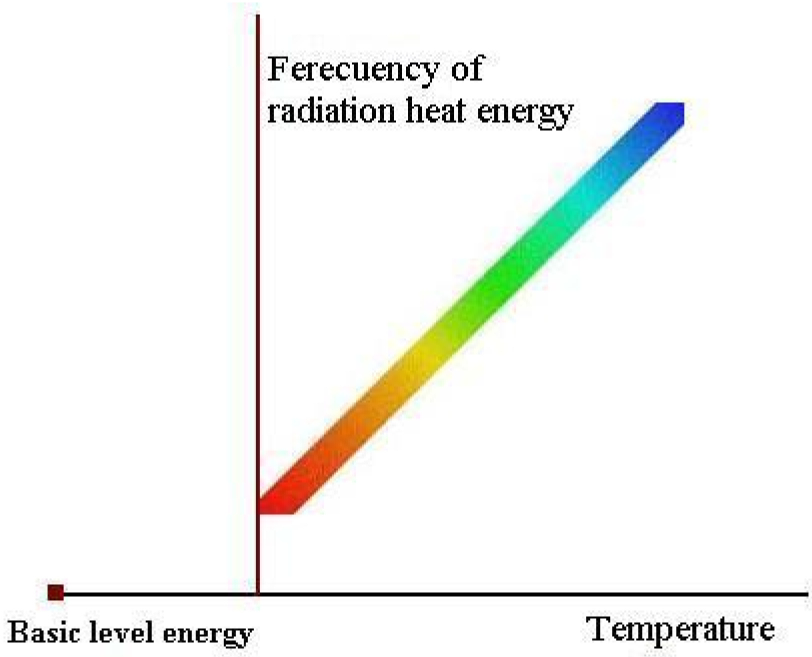
Velocity and temperature of systems

Also, a system (of atoms or molecules) is at basic level energy, if it loses all its energy and its elements keep their properties. When a system is at basic level energy, its charge particles are not able work on each other, so system does not emit heat energy. When a system is at basic level energy, then its temperature is absolute zero.
Suppose a system is at basic level energy, it contains n CPH that they are moving with velocity $v_1=0$ in system. We give heat to it, in fact k CPH with speed c enter into system, and particles of system absorb them. Momentum of system changes that is given by:

$$P_1 + P_2 = P$$

$$k m_{CPH} c + 0 = (n+k) m_{CPH} v$$

System is at basic level energy and heat energy enters into a system. So, its momentum increases.
Here P_1 is momentum of heat energy that enters into system. P_2 is momentum of system, before it takes heat. And v is average velocity after system takes energy. When a system takes heat, then it begins to emitting electromagnetic energy. It radiation depends to its temperature; because by growing temperature, charge particles work on each other faster than law temperature (see following picture).



Everything emits heat energy

Negative power of a system
Consider to a system at temperature T. According to the above section, charge particles work on each other and emit heat energy in any system. Also, in high temperature they works faster than low temperature and loses its energy. So, there is a work function for any system in CPH theory that is given by;

$$W=W(T) <0$$

Any system loses its internal energy continuously, because work of system is negative on itself. So, any system has a negative power (P) that define by:

$$\frac{dp}{dt}=kE_{CPH}$$

Power of a system changes relative time

Here dp/dt is changing of system power relative time. And k is given by;

$$k=k_1-k_2$$

k_1 is the number of CPH that leave system and k_2 is the number of CPH that enter into system. If k>0, then power of system is negative, it means system is losing its heat, like a warm shot in the cold water. If k<0, then system power is positive and system temperature is increasing, like a cold shot in the warm water. If k=0, then system is in thermal equilibrium. In system was be isolation, then k>0 and $p_2<p_1$.

Thermodynamics laws and CPH theory
Let's redefine thermodynamics laws according to the CPH theory.

First law (formal physics)
In any process, the total energy of the universe remains constant.

More simply, the First Law states that energy cannot be created or destroyed; rather, the amount of energy lost in a process cannot be greater than the amount of energy gained.

First law (CPH theory)
Everything is made of CPH. A CPH has constant energy. And a CPH cannot be created or destroyed.

Second law (formal physics)
There is no process that, operating in a cycle, produces no other effect than the subtraction of a positive amount of heat from a reservoir and the production of an equal amount of work.

Second law (CPH theory)
Any system or process has a negative power P that loses its energy, and input power P_1 is less than output power P_2 so that $P_2<P_1$.

Third law (formal physics)
As temperature approaches absolute zero, the entropy of a system approaches a constant.
The Third Law deals with the fact that there is an absolute constant in the universe known as absolute zero.

Third law (CPH theory)
A system never approaches to basics level energy.

Entropy (formal physics)
Quantitatively, Claudius states the mathematical expression for this theorem is as follows. Let δQ be an element of the heat given up by the body to any reservoir of heat during its own changes, heat which it may absorb from a reservoir being here reckoned as negative, and T the absolute temperature of the body at the moment of giving up this heat, then the equation:

$$\int \frac{\delta Q}{T} = 0$$

must be true for every reversible cyclical process, and the relation:

$$\int \frac{\delta Q}{T} \geq 0$$

must hold good for every cyclical process which is in any way possible.

Entropy (CPH theory)
Entropy (S) of a system is equal its negative power (P), P=S>0, so entropy of a system approaches to zero only at basic level energy.

===========

Appendix;
The **laws of thermodynamics**, in principle, describe the specifics for the transport of heat and work in thermodynamic processes. Since their conception, however, these laws have become some of the most important in all of physics and other branches of science connected to thermodynamics. They are often associated with concepts far beyond what is directly stated in the wording.
In thermodynamics, **entropy** is an extensive state function that accounts for the effects of irreversibility in thermodynamic systems, particularly in heat engines during an engine cycle. While the concept of energy is

central to the first law of thermodynamics, which deals with the conservation of energy, the concept of *entropy* is central to the second law of thermodynamics, which deals with physical processes and whether they occur spontaneously. Spontaneous changes occur with an increase in entropy. In simple terms, entropy change is related to either a change to a more ordered or disordered state at a microscopic level, which is an early visualization of the motional energy of molecules, and to the idea dissipation of energy via intermolecular molecular frictions and collisions. In recent years, entropy, from a non-mathematical perspective, has been interpreted in terms of the "dispersal" of energy.
Quantitatively, entropy, symbolized by *S*, is defined by the differential quantity $dS = \delta Q / T$, where δQ is the amount of heat absorbed in a reversible process in which the system goes from one state to another, and T is the absolute temperature.[3] Entropy is one of the factors that determines the free energy of the system.

Zeroth law
If two thermodynamic systems are in thermal equilibrium with a third, they are also in thermal equilibrium with each other.

First law
In any process, the total energy of the universe remains constant.
More simply, the First Law states that energy cannot be created or destroyed; rather, the amount of energy lost in a process cannot be greater than the amount of energy gained.

Second law
There is no process that, operating in a cycle, produces no other effect than the subtraction of a positive amount of heat from a reservoir and the production of an equal amount of work.

Third law
As temperature approaches absolute zero, the entropy of a system approaches a constant.
The Third Law deals with the fact that there is an absolute constant in the universe known as absolute zero.

Combined law
Aside from the established four basic laws of thermodynamics described above, there is also the **combined law of thermodynamics**. The combined law of thermodynamics is essentially the 1st and 2nd law subsumed into a single concise mathematical statement as shown below:[1][2]

$$dE - TdS + PdV \leq 0$$

Here, E is energy, T is temperature, S is entropy, P is pressure, and V is volume.

Entropy
Quantitatively, Claudius states the mathematical expression for this theorem is as follows. Let δQ be an element of the heat given up by the body to any reservoir of heat during its own changes, heat which it may absorb from a reservoir being here reckoned as negative, and T the absolute temperature of the body at the moment of giving up this heat, then the equation:

$$\int \frac{\delta Q}{T} = 0$$

must be true for every reversible cyclical process, and the relation:

$$\int \frac{\delta Q}{T} \geq 0$$

must hold good for every cyclical process which is in any way possible. This is the essential formulation of the second law and one of the original forms of the concept of entropy. It can be seen that the dimensions of entropy are energy divided by temperature, which is the same as the dimensions of Boltzmann's constant (k) and heat capacity. The SI unit of entropy is "joule per kelvin" ($J \cdot K^{-1}$). In this manner, the quantity "ΔS" is utilized as a type of internal ordering energy, which accounts for the effects of irreversibility, in the energy balance equation for any given system. In the Gibbs free energy equation, i.e. $\Delta G = \Delta H - T\Delta S$, for example, which is a formula commonly utilized to determine if chemical reactions will occur, the energy related to entropy changes TΔS is subtracted from the "total" system energy ΔH to give the "free" energy ΔG of the system, as during a chemical process or as when a system changes state.

References:

http://en.wikipedia.org/wiki/Laws_of_thermodynamics#History
http://en.wikipedia.org/wiki/Entropy