

# Quantum idea, entropy and some electricity topics

## Abstract

The first topic encompasses the concept of quanta and I suppose it is not necessary to make an introduction for this theory, which is considered the most exquisite theory ever developed.

Many cut off experiments related to quantum idea have been already published on elkadot website, but as far we are doing the warming up, the newsletter presents only some consequences of quantum idea in every day life.

If quantum theory is right, than a law should be given in order to forbid people to swim in water and to manipulate in special conditions a simple bottle of vinegar. According to quantum predictions, a bottle of commercial vinegar should give all the time the illumination of 3 lightbulbs of 100 W and emit in UV stronger than a sterilization lamp...

Otherwise a new postulate of physics should be formulated as follows:

**Electric charges can neutralize and go extinct without any photon emission (UV, VIS, IR) and without a quantum jump, if this is not in the interest of quantum theory.**

A special battery is presented in the second section. Both electrodes undergo an oxidation process but a current is measured between them contradicting all it has been written in this field for centuries.

The third section is dedicated to a new effect in science. The effect consists in the apparition of an electric current when a semiconductor and a metallic electrode, connected through a conductor, are immersed into a liquid or a solution.

The last scientific topic is related to entropy and second principle of thermodynamics.

Without introducing any new concept or experiment, let us analyze the applicability of entropy concept to chemical and biological systems.

In actual chemistry, entropy plays only a secondary importance. Gibbs introduced long time ago the concept of free energy and correspondingly the spontaneity of a chemical processes is related to this free energy and as consequence there is no use for the second principle of thermodynamics at all. Free energy is depended on three factors: enthalpy, temperature and entropy and from the combination of these three factors a chemical process can be spontaneous or not. Therefore, in the frame of actual science, the extension of second principle of thermodynamics to chemical and biological systems is pure imagination.

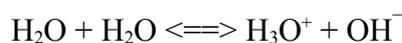
Further on there are some analysis which regard only physical phenomena and it can be easily observed that entropy concept does not apply in these cases too.

As consequence, in proposed theory the second principle of thermodynamics is completely ruled out. The fact gases and some liquids expand in certain condition cannot give enough generality for such a principle.

I think you will find very interesting the last section entitled: „An unwanted theory of science" too.

## Section 1 Quantum concept in everyday life ...

The self-ionization of water is an ionization reaction in pure water or an aqueous solution, in which a water molecule, deprotonates to become a hydroxide ion,  $\text{OH}^-$ . The hydrogen nucleus,  $\text{H}^+$ , immediately protonates another water molecule to form hydronium,  $\text{H}_3\text{O}^+$ . It is an example of autoprotolysis, and exemplifies the amphoteric nature of water. The following equation describes the reaction of water with itself (called autoprotolysis):



The water autoprotolysis constant has a value of  $1 \times 10^{-14}$  at 25 °C and is given by:

$$K_w = [\text{H}_3\text{O}^+] \times [\text{OH}^-] = 1 \times 10^{-14}$$

Let us consider 1 L of pure water with a density of 1.00 g/mL.

From the chemical equation just above, as far both  $[\text{H}_3\text{O}^+]$  and  $[\text{OH}^-]$  are equal, their concentration is square root of  $K_w$ , i.e.  $1 \times 10^{-7}$  M.

On the other hand, we can calculate the exact number of positive charges in 1 L of water using the Avogadro number as follows:

$$N = [\text{H}_3\text{O}^+] \times N_A = 1 \times 10^{-7} \times 6,02 \times 10^{23} = 6,02 \times 10^{16}$$

Each second, in only one L of water, a number of  $6,02 \times 10^{16}$  positive species get extinct and an equal number is generated.

During this charge neutralization and extinction an entire spectra (fig 1) in UV, VIS and IR specific for hydrogen must be generated as far the proton get an electron and some quantum jumps take place in order to extinct the electric charges.

Having only a hydrogen proton neutralization, some specific lines in UV, VIS and IR must appears as in tab.1.

If this is the situation a very simple experiment has to be performed.

Now, we have very sensitive detectors able to detect individual photons so from technical point of view there is no difficulty to look after  $6,02 \times 10^{16}$  photons emitted by 1L of water in each second. Although quantum theory has a venerable age of more than a century and an entire army of theoreticians worked to develop this theory, no scientist has ever make a prediction about photons distribution in case of this charge neutralization. Let us suppose 1% of emitted photons are in UV, the same percent in VIS and the rest of 98 % are in IR.

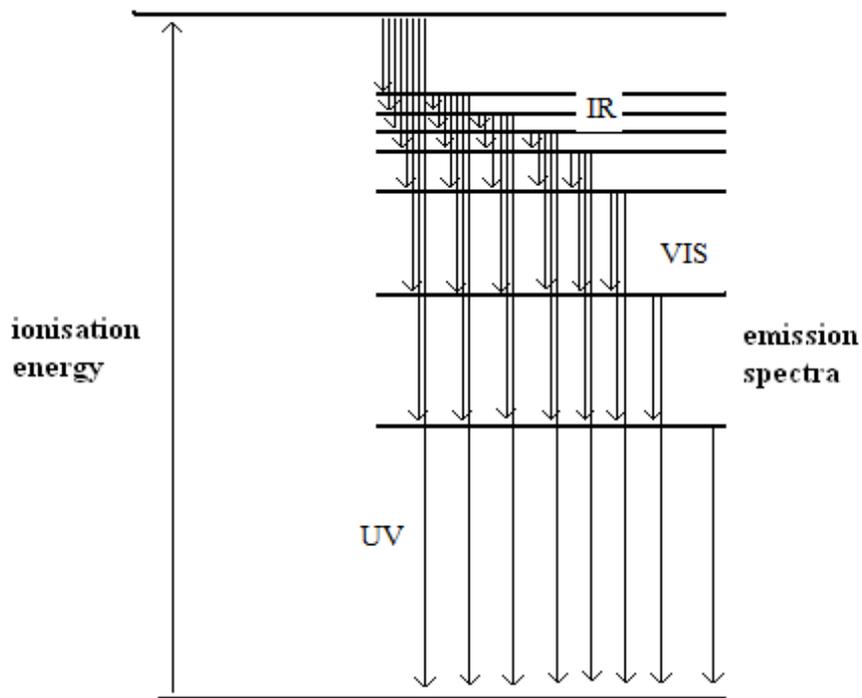


Figure 1. Hydrogen spectra expected to appear according to QM for pure water

Wavelength (nm)	Color or region of EM spectrum
Lyman Series	
93.78	UV
94.97	UV
97.254	UV
102.58	UV
121.56	UV
Balmer Series	
383.53	Violet
388.9	Violet
397	Violet
410.17	Violet
434.04	Violet
486.13	Bluegreen (cyan)
656.27	Red
656.28	Red
Paschen Series	
954.62	IR
1004.98	IR
1093.8	IR
1281.81	IR
1875.01	IR

Tab. 1. Specific line for hydrogen emission spectra

With a simple math we should expect the following number of photons pro L water and pro second :

UV photons	$6,02 \times 10^{14}$
VIS photons	$6,02 \times 10^{14}$
IR photons	$5,9 \times 10^{16}$

The purpose of this experiment is to measure how much photons are emitted in UV, VIS and near infrared, i.e Paschen series. In far infrared these measurements are not relevant as far there is a contamination from background - water is suppose to be at ambient temperature.

When specific detectors tuned for each emission line of hydrogen in Lyman, Balman or Paschen series are brought near a pure water sample, no signal is ever detected.

In fact, for the entire VIS and UV domain a sample of water has no signal at all. The signal in infrared has another origin and it is not generated by charge extinction.

How is this possible to have a detector able to detect a single photon, to have an exquisite theory which predict hundreds of Tera photons for each subdomain and pro second and to observe none?

The answer is very simple and straightforward: quantum idea is a fake....

In fact, there is no need to perform the experiment at all. Let us see some simple every day consequences of quantum theory prediction for this particular case.

Being at seaside, one can have under his vision not 1 L of water, not 1 m<sup>3</sup> but at least 1000m<sup>3</sup> of water.

How many photons are emitted by 1000 m<sup>3</sup> of water in UV domain pro second?

Let us see:

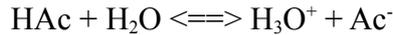
$$N_{UV} = 1000 \times 1000 \times 6,02 \times 10^{14} = 6,02 \times 10^{20}$$

Going and swimming in water will be a real danger and a law should be given in order to forbid people to live near watersheds; skin cancer and eye damage should be a real concern caused by this continuous UV irradiation. We have to be lucky that quantum theory is a fake, otherwise humans and a lot of other living organisms would have been disappieared or maybe some strange mutations would have been survived.

Quite a same approach and interpretation can be made for a bottle of vinegar, only the strength of the effect is few order of magnitude greater.

A vinegar of 9% concentration is more than 1M, but for the simplicity of calculation we can leave the decimals out. Pure water, it is suppose to have a proton concentration of  $1 \times 10^{-7}$  M, but in case of a vinegar bottle, assuming we have 1M conc of acetic acid, the proton concentration would be  $4,21 \times 10^{-3}$  M.

The following equation describes the reaction between acetic acid and water:



The equilibrium constant for this reaction is written as follows:

$$K_a = \frac{[\text{H}_3\text{O}^+][\text{Ac}^-]}{[\text{HAc}]} = 1.77 \times 10^{-5}$$

From the chemical equation above, it can be seen that  $[\text{H}_3\text{O}^+]$  and  $[\text{Ac}^-]$  concentrations are in the molar ratio of one-to-one and therefore for 1 M acetic acid there is  $[\text{H}_3\text{O}^+] = 4,21 \times 10^{-3} \text{M}$ .

How many recombinations take place and how many photons should be generated by a bottle of vinegar pro second?

We can calculate the exact number of positive charges in 1 L of vinegar using the Avogadro number as follows:

$$N = [\text{H}_3\text{O}^+] \times N_A = 4,21 \times 10^{-3} \times 6,02 \times 10^{23} = 2,5 \times 10^{21}$$

Ooopsss.... a simple bottle of vinegar must emits quite a million times stronger than an equal volume of pure water.

Each second, in only 1 L of vinegar, a number of more than  $2,5 \times 10^{21}$  positive species get extinct and an equal number is generated.

During charge neutralization and extinction an entire spectra (fig 2) in UV, VIS and IR specific for hydrogen must be generated as far the proton get an electron and some quantum jumps take place in order to extinct the electric charges.

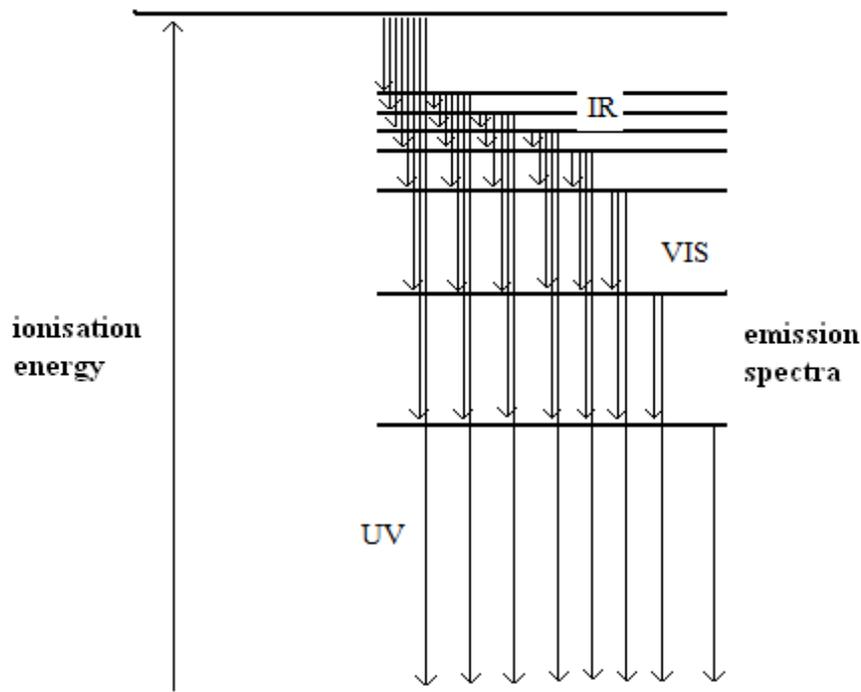


Figure 2. Expected spectra according to QM for acetic acid

Again, having only a hydrogen proton neutralization, some specific lines in UV, VIS and IR must appear as in tab.1. If this is the situation a very simple experiment has to be performed.

We have very sensitive detectors able to detect individual photons so from technical point of view there is no difficulty to look after  $2,5 \times 10^{21}$  photons emitted by 1L of vinegar in each second. Although quantum theory has a venerable age of more than a century, no scientist has ever made a prediction about photons distribution in case of this charge neutralization. Let us suppose again that 1% of emitted photons are in UV, the same percent in VIS and the rest of 98% are in IR.

With a simple math we should expect the following number of photons pro L vinegar and pro second :

UV photons	$2,5 \times 10^{19}$
VIS photons	$2,5 \times 10^{19}$
IR photons	$2,45 \times 10^{21}$

The purpose of this experiment is to measure how much photons are emitted in UV, VIS and near infrared, i.e Paschen series. In far infrared these measurements are not relevant as far there is a contamination from background - vinegar is supposed to be at ambient temperature.

When specific detectors tuned for each emission line of hydrogen in Lyman, Balmer or Paschen series are brought near a vinegar sample, no signal is ever detected.

In fact for the entire VIS and UV domain a sample of water has no signal at all. The signal in infrared has another origin and it is not generated by charge extinction.

How is this possible to have a detector able to detect a single photon, to have an exquisite theory which predicts a vinegar bottle should emit a number of photons comparable with a strong UV or VIS lamp and to observe none?

The answer is again very simple and straightforward: quantum idea is a fake....

In fact, there is no need to perform the experiment at all. Let us see some simple everyday consequences of quantum theory prediction for this particular case.

Let us compare the number of photons emitted by a 100 W lightbulb and a bottle of vinegar.

Everyone has an idea about the illumination generated by a lightbulb of 100 W. Let us see how many photons are emitted by such a device in a unit of time. 100 watts is 100 Joules per second, and the usual yield of conversion for such devices is about 3%.

For simplicity we can consider all photons are emitted at 600nm and the energy of one photon is:

$$E_{\text{photon}} = hc/\lambda = 6,63 \times 10^{-34} \times 3,00 \times 10^8 / 600 \times 10^{-9} = 3,32 \times 10^{-19} \text{ J}$$

The thermal lightbulb has usually 3% efficiency so only 3 out of 100 J are converted into visible light. How many photons are emitted pro second?

$$3 = N_B \times 3,32 \times 10^{-19} \text{ J}$$

and therefore  $N_B = 0,9 \times 10^{19}$

For vinegar bottle we have:

$$N_{\text{VIS}} = 2,5 \times 10^{19} \text{ photons/second}$$

Making a simple comparison, a bottle of vinegar should give the illumination of 3 lightbulbs of 100 wats.

If a simple calculation is made for UV domain, again a simple bottle of vinegar should emit more than a UV sterilization lamp, so special containers should be provided for this simple kitchen ingredient. In this is the case, the product should have been outlawed from antiquity...

If quantum theory is right, a simple bottle of vinegar is one of the most dangerous things near you and it should be regulated by law. Not only this, but a further consequence is people would need no electricity from a company because this bottle must generate enough light for a family house.

The nonsense of these predictions do not need any further comment.

Electrostatic paint application uses positive and negative charges to apply paint in order to ensure an even application. The paint goes past a high voltage positive needle as it leaves the spray gun and the tiny droplets of paint pick up a positive charge. They do this by losing negative electrons. The body being painted is then given a high voltage negative charge which attracts the positively charged paint droplets.

If quantum theory is right, than at charge neutralization an entire spectra in UV, VIS and IR has to be generated as in fig. 3. Of course for paint we have to find a specific spectra for an element like C, O, N depending on the composition of paint, or a mixture of spectra in case electrons are extracted from different elements during electrification.

I think there is no need to make again an exemplification for this phenomena.

The electrostatic painting procedure was patented around 1940. Have you ever found a study about how quantum theory model this phenomena? I found none.

How is possible that in more than a half century none has observed that such industrial procedure contradicts quantum mechanics.

In fact if quantum mechanics were to be right, this procedure and an entire series of electrostatic techniques would have had serious difficulties before implementation; your simple printer would have been a very dangerous device and so on ....

The alternative: a new postulate of physics should be formulated as follows:

**Electric charges can neutralize and go extinct without any photon emission (UV, VIS, IR) and without a quantum jump, if this is not in the interest of quantum theory.**

In this way the quantum jump is invoked only when it is absolutely necessary.

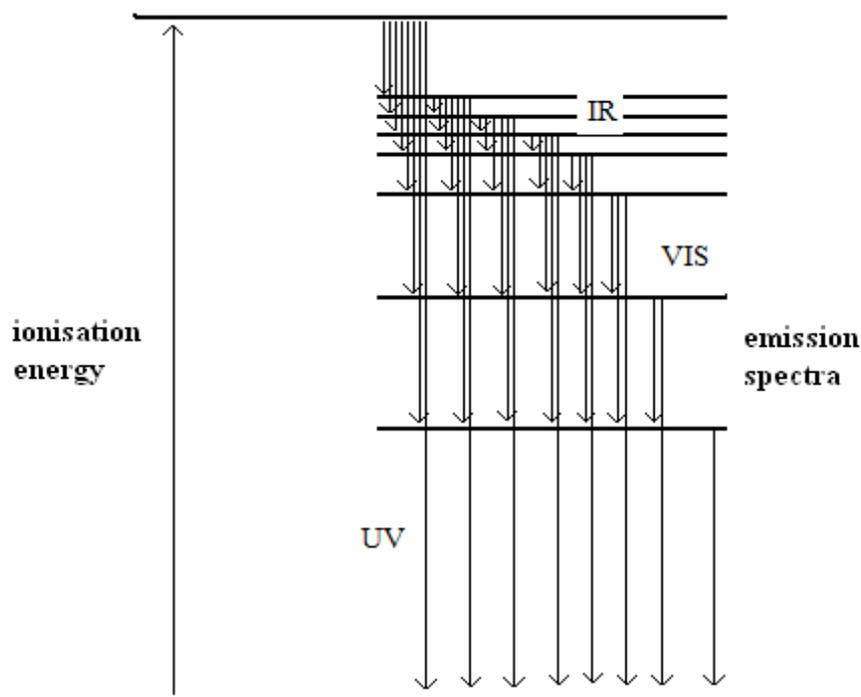


Figure 3. Expected spectra according to QM generate during electrostatic painting

The material will be later uploaded on elkadot site. For chemists there is already a link about acidity concept here:

<http://elkadot.com/index.php/en/books/chemistry/the-acidity-concept>

If a new theory of acidity is necessary for chemistry, even a layman can imagine what the consequences are, not only for research but even for school manuals or for other branches of sciences.

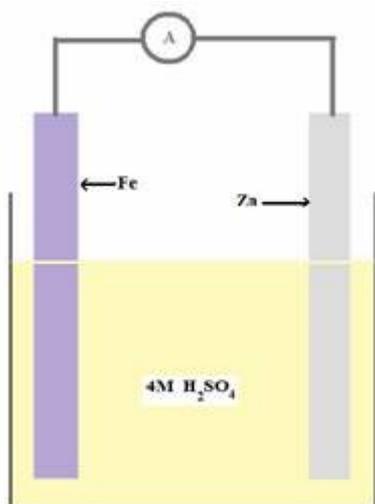
## Section 2 A special battery

An unusual battery is proposed and the experiment can be performed home. The particularity of this cell is the fact that both electrodes (formal cathode and anode) undergo oxidation phenomenon.

The experiment is very simple: put a piece of Fe and a piece of Zn in a sulfuric acid solution and connect these pieces of metal to an ammeter. Although both metals are oxidized, an electric current is generated in an external circuit and bubbles of hydrogen develop at both metallic electrodes.

In the frame of actual science, no possible explanation can be formulated for the experiment and a new frame for conversion of chemical energy in electrical energy have to be proposed.

It cannot be accepted that electrons are generated at both electrodes and they travel in the same conductor in opposite directions only for the sake of traveling...meet each other, greet each other and carries on ...



The detailed description of the experiment and a movie is presented here:

<http://elkadot.com/index.php/en/books/physical-chemistry/special-battery>

### Section 3 A new fundamental effect in science (Effect No. 1)

The effect consists in the apparition of an electric current when a inert semiconductor and an inert metallic electrode, connected through a conductor, are immersed into a liquid or a solution.

The size of the effect depends on a large variety of factors like: semiconductor structure, nature of metal and the type of solution.

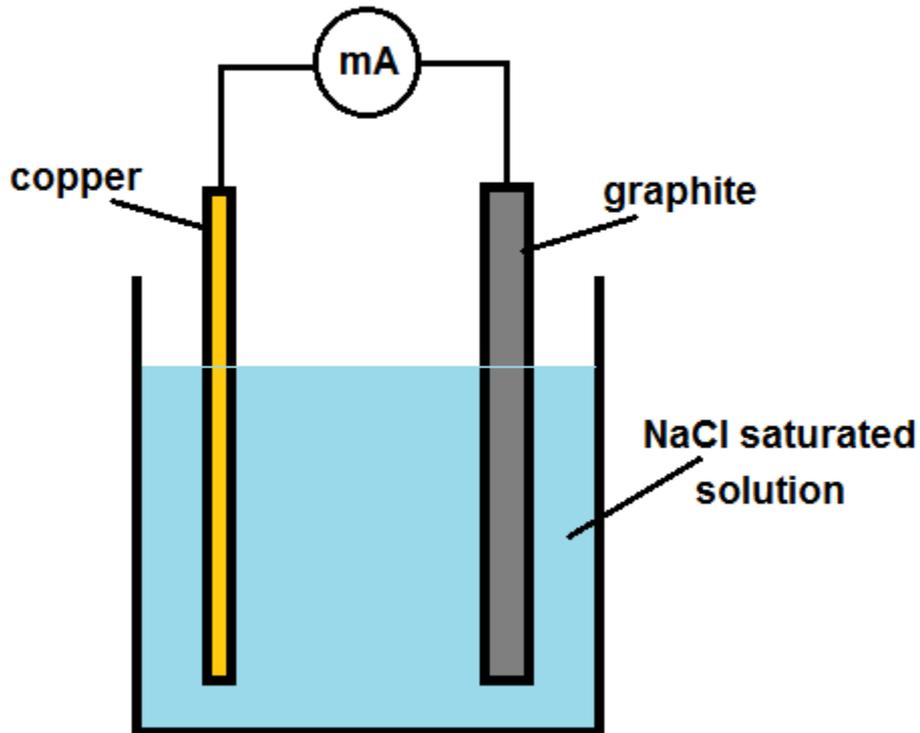
Put a piece of copper metal (2 mm diameter) into contact with water and connect it with a piece of graphite (2 mm diameter) through an ammeter. When the graphite is immersed into water a current of about 1 mA appears into circuit. The current decreases slowly in time. If you take out the graphite, wait for few seconds and immerse it again into water, the electric current appears again.

Of course with such „current size” few people will think that such effect will ever have a practical application...

But, if you change a bit the set up, the effect becomes quite spectacular...

Take a bigger piece of graphite (in my case I repeated the experiment using a graphite cylinder about 5 mm diameter and about 5 cm long) and instead of water prepare a saturated solution of NaCl and repeat the experiment.

The current measured into ammeter when the graphite is immersed into water is about 20 mA. If you keep the graphite into solution, the current decreases slowly in time ....



This simple effect cancels everything you have ever learned about electricity.

Both metal and graphite electrodes are not „electrified”, so there is no charge transfer between these components in order to explain the generation of this current.

There is no chemical reaction in the system able to explain the apparition of this current ...

There is no magnetic field in the circuit able to generate an electric current....

The link :

<http://elkadot.com/index.php/en/books/electromagnetism/first-new-fundamental-effect>

## Section 4 Entropy concept in modern science

### *Background and actual explanation*

Albert Einstein considered the thermodynamic laws as "primordial laws of all sciences" and Sir Arthur Eddington says about them: "the second principle of thermodynamics holds supremacy of the laws of nature ... If your theory is against the second law of thermodynamics, I can give you no hope, there is nothing to do for this new theory than fall into the abysal humiliation possible...."

The world is full of false moralists and people who planted scarecrows! Too bad for those who go in one direction only because the whole herd is going in the same direction!

There is no unique definition for the concept of entropy, but although different definitons were proposed during time, there is an accepted opinion that all these definitions are equivalent to each other. Thus, entropy can be defined as :

- A measure of the probability of obtaining a specific result;
- A measure of the disorder of a thermodynamic system;
- A ratio between heat and absolute temperature of the system.

There is no need to dwell too much on these definitions because they are extensively described in any elementary physics textbook.

Of course, having these options to define entropy, the second law of thermodynamics does not have a standard form. Only few of them are exemplified here, but there are at least 10 different „expressions” for this law.

The formulation given by Kelvin: No process is possible in which the sole result is the absorption of heat from a reservoir and its complete conversion into work.;

The formulation given by Clausius: " Heat can never pass from a colder to a warmer body without some other change, connected therewith, occurring at the same time.."

Clausius introduced the concept of entropy and gave other formulations of the second law based on this concept like: the entropy of an isolated system never decreases

It is accepted that second law of thermodynamics is the most supported and most universal law of physics; according to this, it can be concluded that entire Universe evolves in time toward a greater and greater disorder...

On the other hand, it is accepted that the law makes it possible to define the notion of past and future both in physics and in the real universe. Since the entropy of an isolated system increases with time, measuring its value at different times, we can draw a simple graphic of entropy change and in this way we can define a time axis or a direction of time. „Time” will increase the degree of "disorder " of a system, and the correspondence is biunivocal. This asymmetry at macroscopic level can provide empirical possibility of differentiating between past and future of events and therefore the thermodynamic time is an anisotropic unit. For any other physical law, time is an isotropic size, i.e. physical laws are invariant with respect to time reversal.

Later, researchers have studied the effects of the second law of thermodynamics and acknowledged "that this law is universally valid for a much wider range of processes, not just physical”. It is considered that there is no exception to this law and all events, from the simplest to the most complex, all processes in the universe obey this law. Consequently, the effects of the law were extended to chemical processes, biological, sociological, informational, etc.

### *Why the current concept of entropy is full of nonsense ...*

#### **1. Entropy and biological or chemical processes**

Although physics postulates that entropy always increases or remains constant for an isolated system, this is not at all respected in chemistry. As far biological processes are based

mainly on chemical and biochemical processes, the law is not respected in biological systems too. There is no need to introduce new concepts in current chemistry to show that the second law of thermodynamics is blatantly contradicted by common chemical processes. A chemical reaction does not always take place to increase the entropy of the system.

Since the beginning of chemistry as a science, experimental data have shown that there are two factors that affect the spontaneity of a chemical process:

- spontaneity is favored when the process is exothermic;
- spontaneity is favored when increases, the degree of „randomness" of the system.

In order to mathematically describe the influence of these factors on the spontaneity of chemical processes in physical chemistry were introduced two concepts:

- enthalpy of reaction which characterize the endo or exo thermicity of a chemical process
- entropy which measures the degree of disorder of the system.

Later, Gibbs defined a new quantity called the free energy of reaction (G) defined as  $G = H - TS$ , where H is the enthalpy, T is the absolute temperature and S is entropy. In chemistry (and subsequent in biology), the reaction free energy is used as an indicator of spontaneity of a chemical process and not the entropy, as required by the second principle of thermodynamics. Mathematically it can be determined (tab 1) which combinations of enthalpy and entropy leads to spontaneous chemical reactions (shortly a negative G means a spontaneous chemical process).

$\Delta H$	$\Delta S$	$\Delta G$	result
-	+	-	Spontaneous for any T value
-	-	+ over a T value	Non spontaneous over a T value
		- under a T value	Spontaneous under a T value
+	+	- over a T value	Spontaneous under a T value
		+ under a T value	Non spontaneous over a T value
+	-	+	Non spontaneous at any T value

As it can be easily observed, in the current chemistry, spontaneity and evolution of a chemical systems is given by the combination of three factors, because temperature have to be considered as an independent factor beside enthalpy and entropy.

When the enthalpy and entropy have different signs (case 1 and 4), they operate in the same way and the spontaneous process is not temperature dependent. When the enthalpy and entropy are of the same sign (cases 2 and 3), their effect is opposed and therefore the temperature change will cause a factor to be dominant. In these cases, spontaneity is dependent on the temperature. For case 2, lowering the temperature below a certain limit, make free energy of reaction to become negative and the process to be spontaneous; the opposite is valid for case 3, where a temperature rise over a

certain limit, make the process to be spontaneous. If second principle of thermodynamics held the supremacy, than it's more than hilarious the necessity of introducing the concepts of thermodynamic potential (free energy of reaction) in science ! If the variation of entropy can tell which processes are spontaneous, while do the chemistry need these thermodynamic potential? The logical conclusion to be drawn is that, in this case, the evolution of chemical and biological systems cannot be inferred from the second principle of thermodynamics. Consequently, without the need for new concepts, theoreticians should limit the generality of the second law of thermodynamics only to physical phenomena ( which ones ?!) and accept that for chemical and biological systems, entropy is just factor from a set of three factors that affect their evolution. In the new theory, which will be described in detail in the book, the current concept of entropy is reconsidered to its „true value”.

## **2. Order, disorder and entropy**

The definition of entropy as a measure of disorder for a physical system can be easily ruled out at a brief analysis of the order and disorder concepts. In 1850, Rudolf Clausius introduced the term "entropy" as a quantity which increase due to heat. Because at that time (and even now), heat generally refers to the random movement of particles constituting a system, entropy was considered as similar to the degree of "disorder" of that system. And here we have a big misunderstanding. It is important to note that the thermodynamic studies the thermal phenomena without taking into account the atomic-molecular structure of bodies. It doesnt study the mechanism of phenomena, therefore, does not use the structural representations of material bodies. On the other hand, the atomic order is associated with a particular pattern of arrangement of atoms within a specific structure, while the disorder is associated with the absence of this template. To be more specific, in the case of solid state, the crystal structure is considered an ordered state while the amorphous structure is considered a disordered one. For liquids and gases (ideal or real) it cannot be accepted the existence of an ordered or disordered structure since the constituent particles of a liquid or gas are in constant motion.

Consider an amorphous material (glass, asphalt, etc.) subjected to a cooling process from a temperature of  $T_1 = 300 \text{ }^\circ\text{C}$  up to a temperature of  $T_2 = -100 \text{ }^\circ\text{C}$ . At both temperatures the material is presented in a solid form, but we are interested in how the order of the system „increases or decreases” between the two temperatures. Let us suppose for temperature  $T_1$  we have a correspondent entropy  $S_1$  and similarly entropy of the system at temperature  $T_2$  is  $S_2$ . In accordance with the third law of thermodynamics, which states that lowering the temperature lowers the entropy, we must have  $S_2 < S_1$ . But is this decrease in entropy reflected in increasing order of the system?

The question is rhetorical and the answer can give even a novice in physics. Lowering the temperature does not increase the degree of order of the system, i.e. an amorphous material can not

be transformed into a crystal. The X-ray diffraction studies can confirm that the change of temperature does not lead to changes in the arrangement of atoms in the network, so it does not change the degree of order or disorder. With decreasing temperature, in fact there is only a limitation for the the movement of these atoms around the equilibrium position.

Let us consider another experiment, often used in argumentation for irreversibility of physical phenomena and entropy increase. A ball hits a plate and depending upon the nature of the collision a smaller or larger kinetic energy is transformed into heat. If the collision is almost elastic, only a small fraction of the energy is transformed into heat. If the collision is plastic ball and/or surface are deformed and near all the kinetic energy of the ball is converted into heat. In both cases, current theorists justify the entropy of the system increases (less obvious for elastic collision), because the amount of heat released during impact corresponds to an increase in entropy of the system.

Does this „growth" of system entropy corresponds to an increase in disorganization of the system?

For nearly elastic collision, the amount of heat released is dissipated without notice macroscopic changes for studied bodies. At atomic level, using X-ray and electron diffraction it can be verified that there is no change in the original structure of the constituent materials .

Even in case of plastic collision, where the total amount of kinetic energy is transformed into heat, there are no change in the state of order or disorder at the microscopic level (excluding the case when the amount of heat generated is so great that the material melts or a vaporization occurs!). Current theoreticians claim that during these clashes, the system switches from one state with a low probability to a state with high probability, and as consequence this change will lead to chaotic motion of particles material: but this assumption is pure fabrication. Of course in case of a plastic colision, there is a change in the form of ball and/or surface, but these are side effects that do not affect order and disorder; these changes affects only the utility value of some goods for further practical use. Therefore, in the new proposed theory the connection between the concept of entropy and order at microscopic or macroscopic scale is irrelevant. Expanding the laws of thermodynamics to human behavior or other processes, where order and disorder are more than subjective concepts, is a unpardonable error of modern physics and this error has to be avoided in the future.

### **3. Why entropy cannot be defined as a probability or as heat divided by absolute temperature either**

#### *Experiment no. 1. The entropy of a mixture of ideal gases*

Consider two containers filled with equal volumes of noble gases connected by a narrow tube as shown in Fig. 1. A container is filled with helium and other with xenon. Temperature of both

balloons is  $25^{\circ}\text{C}$  and the gas pressure is 0.5 atm inside and in equilibrium with surrounding temperature. Under these conditions both gases have a behavior similar to that of an ideal gas.

When the valve that connects the two compartments is switched to the open position, gases mix spontaneously and system parameters remain constant (pressure, temperature, total number of moles of He or Xe in entire volume).

It is accepted that the entropy change (an increase of entropy in this case) is the driving force that generates the redistribution of atoms of He and Ar between the two balloons, until it reaches a state of maximum distribution (scattering) as shown below.

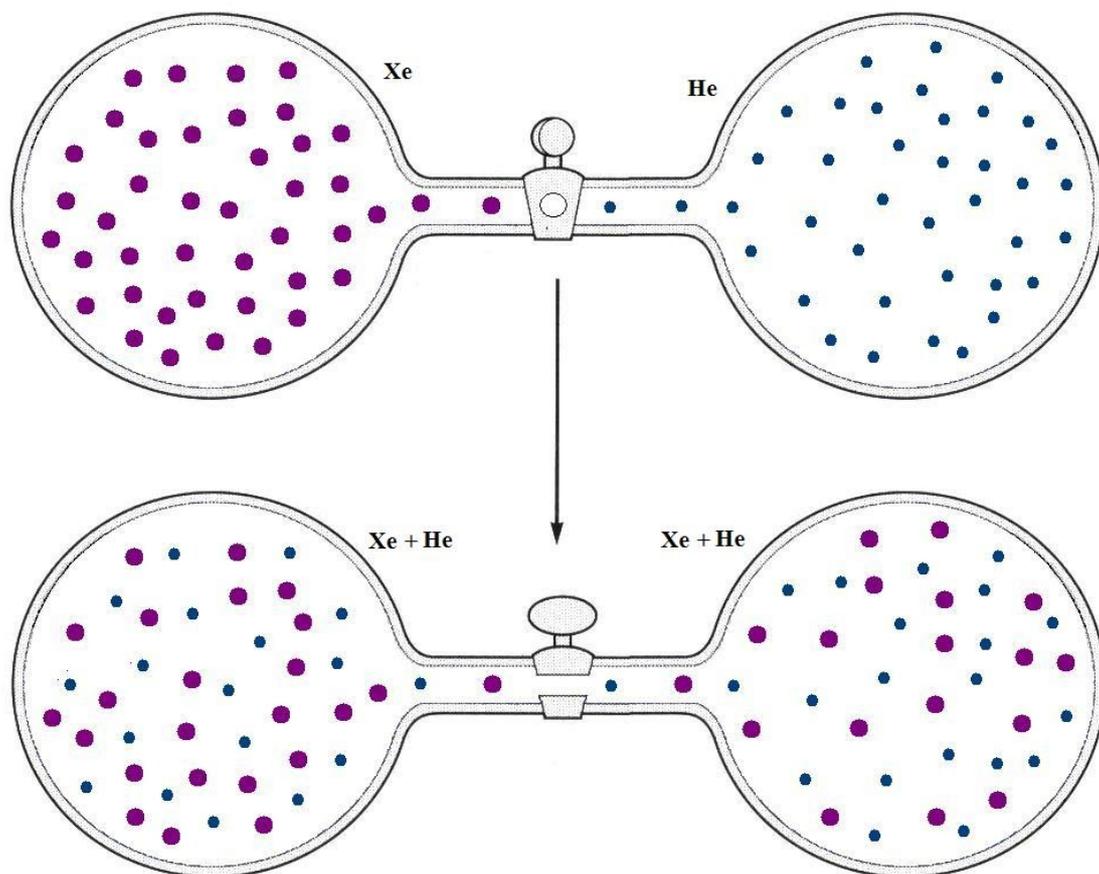


Figure 1 Entropy change during gas mix.

Kinetic molecular theory assumes that for an ideal gas particles undergo elastic collisions with each other or with the walls of the container; but you would not find in any physics textbook or even in advanced treatises, what happen when two gases with different molecular weights mixes at the same temperature. Let's see what conclusions are inferred when a volume of helium (molecular weight  $M_{\text{HE}}=4$ ) mixes with a volume of Xe (molecular weight  $M_{\text{XE}} = 131$ ). For simplicity to

consider  $V_{\text{He}} = V_{\text{Xe}} = 1 \text{ m}^3$  and system temperature  $T = 298\text{K}$ . From experimental point of view, after opening the valve, gases mix without absorbing or releasing heat, and the temperature of system remains the same.

But are these experimental facts in agreement with kinetic molecular theory?

The temperature of a gas is considered to be a measure of the kinetic energy of molecules and kinetic energy depends on the square of the velocity of the molecule.

At temperature  $T = 298 \text{ K}$ , helium atoms, respectively Xe atoms move with significantly different average speeds. These can be calculated with the formula:

$$v = \sqrt{\frac{3RT}{M}}$$

where  $R$  is the universal gas constant,  $T$  is the temperature and  $M$  is the molecular weight.

For He we have:

$$v_{\text{He}} = \sqrt{\frac{3 \cdot 8,314 \cdot 298}{4 \cdot 10^{-3}}} = 1363 \text{ m/s}$$

For Xe we have:

$$v_{\text{Xe}} = \sqrt{\frac{3 \cdot 8,314 \cdot 298}{131 \cdot 10^{-3}}} = 238 \text{ m/s}$$

As it can be seen there is a major difference between the speeds of the helium atoms and Xe atoms at the same temperature.

When the valve is open and gases start to mix, and even after arriving at equilibrium, there will be elastic collisions between the helium and xenon atoms, and collisions of individual atoms of xenon or helium with container walls.

As result of collisions between atoms and walls, xenon or helium velocities remains constant (wall can be considered infinite mass by comparison with mass of atoms). However, helium atoms can collide with the xenon atoms inside the container. Kinetic molecular theory gives us a specific unit which estimates the distance through such atom before the collision takes place and it can be shown that we have a high frequency of such collisions. To simplify the situation, we consider only frontal collisions between the He and Xe atoms; in case of real collisions which can take place under any angle of incidence, the situation is more difficult to be treated mathematically, but the conclusions are the same.

From the theory of collisions, noting with  $u_1$  and  $u_2$  speeds before the collision,  $v_1$  and  $v_2$  after the collision, and considering that  $m_1$  and  $m_2$  are the masses of the bodies participating in the collision, we can apply the law of conservation of momentum and energy, in order to calculate the final velocities.

$$\frac{m_1 u_1^2}{2} + \frac{m_2 u_2^2}{2} = \frac{m_1 v_1^2}{2} + \frac{m_2 v_2^2}{2}$$

$$\frac{m_1 u_1^2}{2} + \frac{m_2 u_2^2}{2} = \frac{m_1 v_1^2}{2} + \frac{m_2 v_2^2}{2}$$

Solving this system of equations with respect to  $v_1$  and  $v_2$  yields:

$$v_1 = u_1 \frac{m_1 - m_2}{m_1 + m_2} + u_2 \frac{2m_2}{m_1 + m_2}$$

$$v_2 = u_1 \frac{2m_1}{m_1 + m_2} + u_2 \frac{m_2 - m_1}{m_1 + m_2}$$

In our case having  $u_1 = 1363 \text{ m/s}$  and  $u_2 = -238 \text{ m/s}$ ,  $m_1 = 4$  and  $m_2 = 131$ , we obtain:

$$v_1 = 1363 * \frac{-127}{135} - 238 \frac{262}{135} = -1744 \text{ m/s}$$

$$v_2 = 1363 \frac{8}{135} - 238 \frac{127}{135} = -143 \text{ m/s}$$

As can be seen, the velocity of the atoms involved in the collision elastic changes and this will lead to the existence of two different temperatures, and both will be different from the experimentally one.

The temperature given by the helium atoms must be:

and another given by xenon:

$$T_{\text{He}} = \frac{M_{\text{He}} * v_1^2}{3R} = 487 \text{ K}$$

$$T_{\text{Xe}} = \frac{M_{\text{Xe}} * v_2^2}{3R} = 107 \text{ K}$$

These results are more than disastrous for the kinetic molecular theory. When mixing the two ideal gases, the energy of the particles should change depending on a whole range of factors such as molecular weights of the molecules involved in the collision, the collision angle, etc. Under these conditions, the current theoretical concept of temperature becomes meaningless, and of course the whole thermodynamics in the absence of this concept is nonsense.

Not only the concept of temperature, but the concept of diffusion of gas is inconsistent with the experimental data too.

Suppose that the pipe connecting the two containers has length of at least 2m and the valve is fixed in the middle of the tube. When the valve is open, the helium atoms will tend to move toward xenon tank and xenon atoms will tend to move in the helium tank. However, as a result of collisions between these species, helium atoms are returned to the same tank with a higher temperature, while the xenon atoms are able to slowly penetrate along the connection tube to the reservoir of helium. Therefore, a diffusion of high molecular weight gas in the gas with low molecular weight has to be observed at least in the initial transient stage. This assumption is in clear conflict with the law of diffusion ..... Of course, besides contradicting the diffusion law, the actual model leads to major thermal effects that have never been observed experimentally. It is impossible when mixing two gases, both at ambient temperature to arrive at different temperatures.... one to increase its temperature to about 215 °C , and the other to decrease it to about -165 °C .....

Towards the end, but just as important, it is necessary to compare between them, the two definitions of entropy based on probability concept and heat.

It is recognized that entropy characterize each state of a thermodynamic system and is closely related to thermodynamic probability (also called statistical weight ) of respective state. The relationship between entropy and thermodynamic probability of a state that state was established by Boltzmann :  $S = k \ln W$  where k is a proportionality constant called the Boltzmann constant and W is the thermodynamic probability of the respective state.

On the other hand, the entropy as a function of the second principle of thermodynamics, to an infinitesimal reversible process can be written as:

$$dS = \frac{\delta Q}{T}$$

A gas consists from individual molecules which have weak attractive forces between them. For the matter which is in liquid state, and especially the solid state, the forces of attraction between particles are much stronger. This makes it impossible a probabilistic distribution of particles for such systems. For example, when a solid is formed as a result of a chemical reaction, its constituent particles are not free to move randomly and to have a random ordering. There is a certain pattern arrangement of atoms in a solid. The simplest example would be the formation of solid ammonium chloride, when the acid chloride and ammonia gas reacts. For hydrochloric acid and ammonia in the gaseous state, it is acceptable that these molecules can have a random distribution and maybe we can describe their comportment based on statistical laws. However, once ammonium chloride is formed no atom of this complex has freedom of movement and all atoms are part of a structure called a macroscopic crystal. Neither ammonium chloride molecule as a whole, no longer is free to

move inside the crystal or redistribute statistically. Therefore, the concept of entropy as a statistical weight for solids and liquids is more than a nonsense.

Equally absurd are the current interpretations of dissolution or other physico-chemical phenomena which are considered to be driven by a state of maximum probability (increased entropy). If we take a few grains of salt (NaCl) in a glass of water, it is observed that the salt is dissolved after a certain period of time, even in the absence of agitation. It is recognized that the dissolution occurs because the entropy of the system is increased when the salt is dissociated into ions and form a solution. But this interpretation does not give any indication about what happens to entropy when salt is added to a larger amount so as to exceed the limit of solubility of sodium chloride (36 g per 100 ml of water at 25 °C). If we add 40 g salt per 100 ml water (25 °C), only about 36 g of the salt dissolves and the rest of 4 grams remains as solid with or without flask stirring.

How to interpret this simple fact ?

A „common sense " interpretation should admit that there is a limiting factor that prevents entropy to grow continuously. In the case presented, the solubility is a deeper and more important factor than the entropy, and we can not speak about entropy without taking into account the solubility.

Of course yet another simpler experiment can be formulated which demonstrate that solubility is more important than the trend postulated by principle II of thermodynamics. It is well known that water and oil (edible) do not mix due to their low mutual solubility. However, if an oil-water mixture is subjected to a process of vigorous stirring, a dispersion of oil in water is formed and this can be maintained as long as stirring is maintained. This state of dispersion has a much higher state of disorder compared to the initial state when there were two separate immiscible liquids based on density. However, as soon as agitation is stopped, the system returns to the initial state, and we have two immiscible layers separated by the difference in density. It seems that the law of solubility is more important than the second principle of thermodynamics, because the system reverses to the initial state even in the final state entropy of the system decreases.

In the light of all these considerations, in proposed theory, the second principle of thermodynamics is completely ruled out. The fact gases and some liquids expand in certain condition cannot give enough generality for such a principle to exist.

## **Section 5. Other items**

### ***An unwanted theory of science***

No article from this theory will be ever published in established peer review journals. For more than two decades these journals and their editors have used any trick to prevent the progress in

science; quite perfect organizations and structures have been built in science and none can be made responsible for huge errors with incommensurable damages to society.

Can someone accuse an editor for not giving ok for publishing to my first article submitted in 1995 or after? It is very easy to get hidden behind the rules of publishing and justify any absurd decision.

All other established journals have followed a copy carbon procedure regarding this new theory of science.

Therefore, I considered important to bypass the official structures and inform the end users about this new theory of science and the results are more than satisfactory. From the beginning of this publicity campaign less than 3% of physicists and less than 1% of chemists chose to unsubscribe from different reasons. To date, a total of more than 185000 scientists - chemists and physicists, all over the world, are still receiving this newsletter. There is still a lot of work necessary to get in touch with chemists from some countries, but this will be done in few months.

Any important change produces damages for some people, but anyone must realize that a dead theory cannot be kept alive only for the sake of some dead or alive personalities.

By the end of the year a newsletter will be published and anyone will discover that even the concept of temperature has a wrong interpretation and the experiment to rule out the kinetic molecular theory can be performed in the kitchen with no cost at all.

I do not think that developing countries and even some developed countries will continue to spend billions for a dead research which goes nowhere. They will prefer to either stop the research or to switch to the new proposed theory. There are already cracks in the scientific community in developed countries too, but here I expect a slower change. Old habits die hard !

On the other hand, I am looking for capital in order to build a competitive private research laboratory in Romania and later to expand it to a research network in other countries. Universities can also become partners.

Although the information presented on site seems to have no much commercial application, the opposite is true. There are a lot of topics with big potential application which are already solved from many years or others which are in progress.

For example, a theory which explain the superconductivity (at high or low temperatures) was formulated around 2004. Until now, in a real progressive society, we would have had already commercial application for superconductors at ambient temperatures.

Another example of a research which is still in progress: have you ever thought that an hurricane can be tamed and kept under a level 2? What's better in your opinion: to stay and watch at TV how an hurricane develops and arrive at level 3 even 4 and produces damages of billions, or to develop a technology able to keep it under level 2 with a cost of few millions?

Other topics are to be discussed with interested people.....

Other technical info:

A link was created with all published newsletters in the field of chemistry and physics and it will be updated soon with possibility to download the newsletter as pdf document.

<http://elkadot.com/index.php/en/home/published-newsletters>

Please check the link from time to time because your server can bounce some of my emails.

Best regards

dr. Chem. Sorin Cosofret