

# CHAPTER 25

## OTHER PHENOMEN CHEMICALS

## **Other chemical phenomena I:**

**Alcohol** cleans through the heat of the stomach.

**Intestines** : there are substances that disintegrate the proteins or food from the intestines to be transported to the different parts of the body and once there they rejoin (partly due to the heat that came out of the breath).

**Sweat** acts as a protective film from the outside, since radiation does not impact directly against the skin and, therefore, does not affect the pores by dryening them.

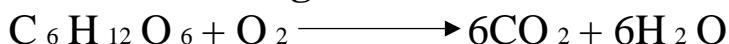
**Agulletes:** caused by dairy acid that becomes a waste product; lactose is transformed into lactic acid (like glucose, which can also be produced when lactose lacks, thanks to its transformation in  $\text{A. Pirúvic}$ , which also generates lactic acid) in the presence of a enzyme; When this enzyme does not exist, we take yogurt to get it. When the muscle cools down, after training, the physiological conditions are ideal for the formulation of said acid, which takes crystalline consistency.

**The ferments** are like a kind of enzymes that are spilled in the barrel and help the sugar of the grape to become wine. When no sulfur is placed in it, the oxygen is not removed, therefore, the liquid can be invoiced in vinegar.

Alcoholic fermentation: there is no net oxidation:  
(it is necessary to match the reaction):



While in **breathing** it does exist clean oxidation:



**Krebbs cycle** is equivalent to breathing and consists of 3 stages:

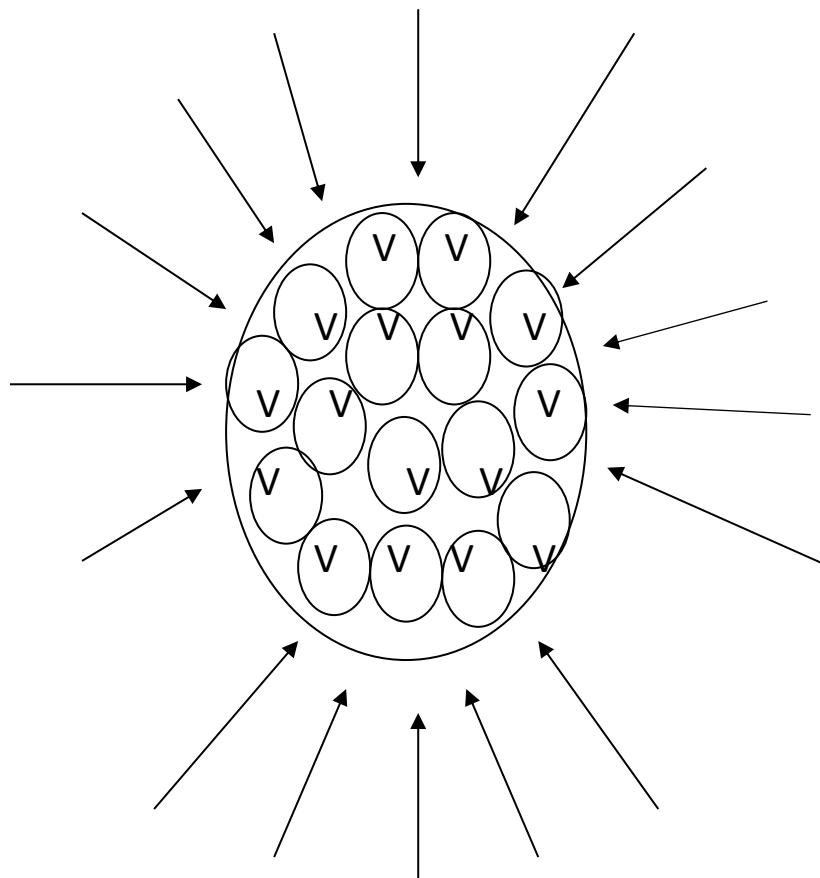
1. external breathing (catchment of O<sub>2</sub> and expulsion of CO<sub>2</sub>).
2. the transport phase of oxygen through the blood (hemoglobin) into the cells
3. Internal breathing, which is what builds the previous Krebbs cycle.

## Other studies of chemical phenomena II:

**Batiscaf**: To avoid a too strong pressure in the container when we start the dive, we will increase the volume of the units (fig.82)

But we have to be careful because when we get to the surface we unzip ourselves and we can explode.

Fig. 82:



**The more heat you have, the more you sweat**, since the water is a system to expel heat (when it loses heat).

Heat always flows from where there is more to where there is less. Below any level, it is cooler than the top step, as there is a current flow and the steam rises by action of the Temperature

In the summer you need to expel heat since the body temperature is 36 or  $36.5^{\circ}\text{C}$ ; In contrast to the winter do not sue because you do not need to lose heat but to earn calories.

At night we do not generate energy, but we go directly for what we have stored. Such E is used to keep the vital constants up and running. From time to time we wake up because we need oxygen.

### **Fats** or saturated or unsaturated carboxylic acids:

Apart from saturated acids there are also non-saturated ones (with one or more double bonds / molecule); They reduce the melting point.

Therefore, in terms of other conditions, the unsaturation of a fat tends to lower the melting point and convert it to liquid at room temperature.

The hydrogenation of some double links to cheap oils converts the liquids into solids comparable to the mantles.

Hydrogenated fat is more likely to get stale than a non-hydrogenated one.

Racidity: volatile aldehyde or acids that attack reactive alloys positions in the fat molecules.

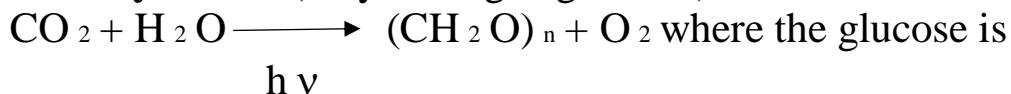
**Cooking:** with water ( $\text{H}_2\text{O}$ ) it is boiled, the substrate acquires water up to a limit of capture after which the cells dissolve (similar to the osmosis)

While I cook with oil. the situation is different: it fries and the substrate decomposes and burns

**Hypotension** : voltage drop (because of a decrease in a liquid or increase of the container).

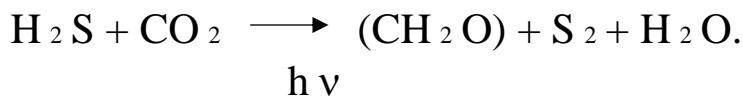
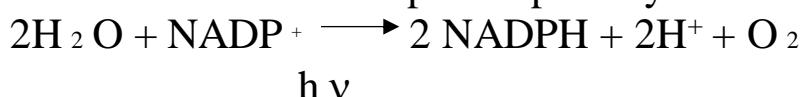
While **hypertension** is the other way around (therefore when we say that you are suffering from excessive pressure or pressure, we are right).

**Photosynthesis** (only among vegetables):



chemistry energy or power itself.

When illuminating chloroplasts isolated from spinach,  $\text{O}_2$  was released and  $\text{CO}_2$  was not needed for the oxygen detachment  
The natural electron acceptor in photosynthesis is the  $\text{NADP}^+$



Photosynthesis occurs thanks to the existence of specific pigments in chloroplasts. Large pigment molecules capable of transforming light energy in chemistry are the reaction centers.

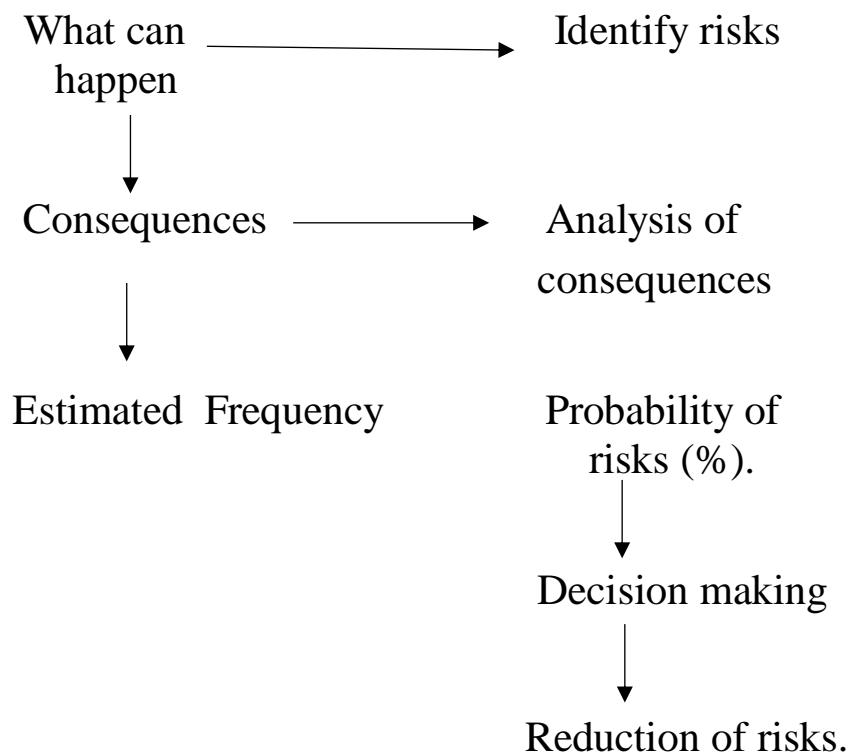
In the forests or places with vegetation there is water. If there is no such being there is no place to go (since we remember that plants make photosynthesis and chlorophyll function with water and  $\text{CO}_2$ ). The instinct of the plants to go where there is water (roots). If you lower the vegetation because of the humidity drop, and if you increase the temperature of the world because of the ozone layer and the greenhouse effect.

Chlorophyll is found in chloroplasts, where photosynthesis takes place.

Here I will finish including concepts of the atomic spectrum and the scale of colors that the human eye absorbs:

Recall that the chlorophyll (green) pigment is found in the chloroplast if it is responsible for the chlorophyll function or photosynthesis; It is to be expected that green leaves will mask colors less green, which is what it ejects (that is why it is what we see on the plants in full day). We know that the black color originates when all colors are absorbed (I explain it on the subject of the black body, the light-matter interaction), while the target expels them all.

## **Waste management and analysis and prevention of environmental risks:**



While the *format* of a risk assessment is based on the assessment scale or standard criteria on which to carry out the study, the *registry* is based on the unrealized values of each company in particular.

To carry out this study in a reliable and accurate way, we need information as much as possible:

- 1- compilation : of the characteristics of the product or element to study (previous accidents, results in different situations, properties of chemical products ...).
- 2- prediction : (laboratory tests, effects of chemicals in different situations ...).

Such a bibliography is like a previous record or story.

**Toxicology :** Science that studies the adverse effects of substances on living organisms:

The dose and the toxicity of the sample produce an effect, just like the exposure.

*Process and procedure* : the first one refers to the steps to follow in case of an emergency, measures to take ... (it is the same for all companies)

The second belongs to each organization.

It depends on the magnitude of the company.

*Evidence problems* : there are different dangers that appear and, by themselves, they are already potentially serious, that is, they overcome non- malady.

The *diseases* can be reversible or irreversible, as well as their effects can be chronic or acute.

There are also problems inherent in the system, that is, they are intrinsic

Invest in security: well without funds.

*The high command* must give an example, as well as facilitate the *documents of instruction* (the simpler and the better ones) the work contract and the place or the possible *training of the employee*.

Identify errors, know how to understand mea culpa, and prevent both internally and externally the possible eventualities:

Ex: have a *security file* on each product or substance. In addition, the *threshold amount* of any product on which there is risk of accidents must be kept in mind .

It is also necessary to take care of the storage mat, as well as the temperature or pressure or concentration to which they are subjected during a certain period. In addition to the products that are in contact (involved) with possible secondary reactions ...

Habitually *containment measures* include co-correction and prevention.

Also *identify sources of pollution*.

Possible *sources of risk*: manpower, materials, maintenance, method, machinery, environment (or environment).

Possible *damages* to the exterior, natural elements, people, flora and fauna ...

Update the action plan every 3 years if problems arise: emergency, evacuation, equipment availability, act in the shortest possible time, ...

In the estimation of risks, it is necessary to examine the *frequency* or probability with which the accidents occur, as well as the *magnitude* or seriousness with which they occur.

We need to know when we are in *normal* or routine state and when we are at *risk*.

*Caffeine* stimulates the nerves and the heart as well.

Sauna: the water that escapes and evaporates . The temperature of the enclosure ( $T_1$ ) is greater than that of the body ( $T_2$ ); then the former captures the second and causes sweating because it evaporates the body's fluid.

There is, however, a threshold temperature because if not man would dehydrate.

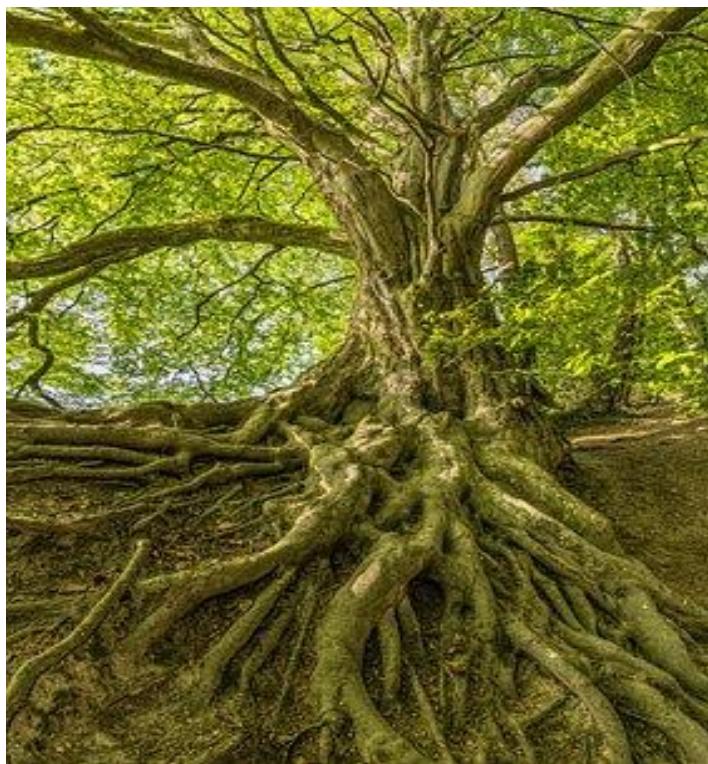
*Pasteurization* : warm up to a certain point, and then, to prevent the bacteria or ferments from being removed, they are placed in the fridge (or refrigerator). So they do not die when they warm up and are useful for the evolution of such a product .

*Neurotransmitters:* When there is excitation or electrical inhibition to open the pores, transmission of *nt* 'occurs .

With electrodes we see that the potential difference between and inside of the neuron is -70 mV.

If this potential difference reaches -59mV is that the  $\text{Na}^+$  and there on Ingress is transmitted through open pores *nt exciter*.

However, in the case of *inhibitory nt*, the amount of  $\text{K}^+$  pumped outwards is greater than the amount of  $\text{Na}^+$ pumped inwards, and it expels (this occurs when the potential is -75 mV).



## **Other chemical phenomena III:**

### **The energy we consume or source of land resources .:**

**Raw material** is in danger of extinction.

For millions of years, in proportion, we had a lot of money, and it has disappeared exponentially as we have *created needs* that we do not need at the bottom.

We must find new *energy (alternative)* such as *wind, solar, wind, thermal ...*

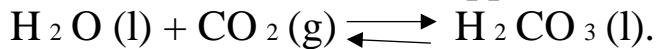
Nowadays it costs more to pick it up than to make it fall.

In the interior of the earth, hot magma is the nucleus or as we will say in plain language, the kitchen of the earth. It is where density exists and where gravity is born.

**Density of the gel:** it has been demonstrated, with density calculations / T°C

that the densest point of the water is in the liquid state at 4 ° C , since otherwise, in a system with H<sub>2</sub>O (l) and H<sub>2</sub>O (s) the ice would lower to the bottom, and it is not the case.

**Bottled gas drinks:** what happens is this:



## **Other chemical phenomena IV:**

**Hemoglobin:** use the Faith because it is compatible with oxygen and thus, as we have seen in other documents, it is transported to different parts of the body.

## Other chemical phenomena V:

### Antimatter:

It does not generate waste because it is neutralized.

There is a combination of fields. Electrical and magnetic so that a vacuum is formed.

At rest, the matter goes away with the antimatter, since matter and antimatter tend to balance.

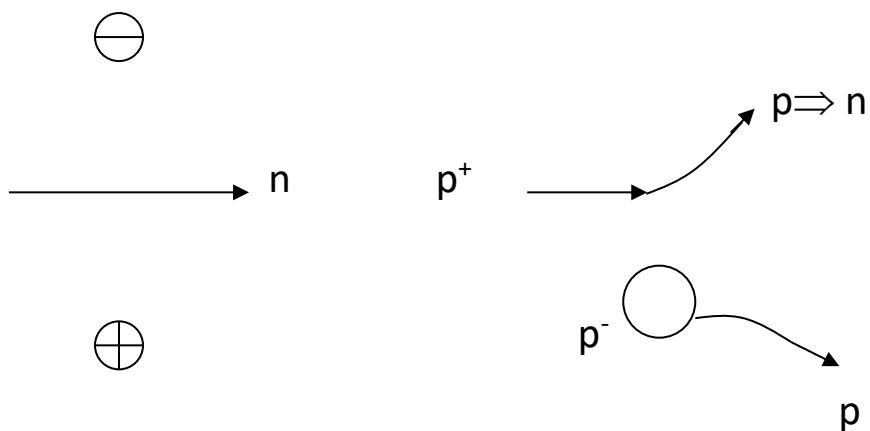
We have several mechanisms to verify if fundamental particles have the same load, too (depending on the degree of curvature in the presence of an electric field or from what it takes to reach the other end of the camera, respectively).

$P + i P^-$  protons and antiprotons respectively.

$e^-$  and  $\beta^+$  electrons and positrons respectively.

Fig. 83:

(A)



When neutrons do not experience any deviation or fluctuation:

If we analyze the particle accelerator we will see that a gas cloud such as Heli, Xenon, or some other element in a gaseous state that collides with antiprotons, for example, obtains electron-positron pairs (it is known which they are because antiprotones capture positrons and form hydrogen antibodies, which is the opposite of an hydrogen atom )

We know that a proton is the sum or the fusion of a neutron plus a positron, while the antiproton is a neutron plus an electron.

As with one of the two types of rays that we will discuss in another chapter (*cathode rays* and *channels or positive rays*), specifically the channels, they first lose electrons or, when they reappear, emit light. Well, more or less that's what happens:

By impacting with a plate of some element or metal with silver, silicon or gold, the particles of the anti-hydrogen are disintegrated, separating; then the positrons return to join with the electrons and annihilate (hence the antimatter is known to have no mass but only a nucleus of energy, such as gamma radiation), whereas the Anti-proton continues its path.

Obtaining antiprotons, as well as positrons, is a task that is left to the physicists.

The second chapter refers to the **disturbances in the noise or data transmissions:**

Disturbances are the opposite of the tenuants.

Distortion is a cause of disturbances, while the shield is a source of them.

We will now touch on the topic of **generic drugs:**

They give a good image facing the outside and consequently allow a good behavior of the chemical industry, because they are destined to third-world countries.

It is a kind of business for multinational companies because it reduces costs when they struggle with competencies

They are financed by governments, as well as saving and in social security.

In addition, however, we find that the workforce of any corporation must be reduced to minimize expense.

The density of liquid water against the density of the gel:  
According to studies carried out, liquid water is denser than ice, hence the ice only covers the surface of any reservoir and does not lower to the bottom. But the maximum density is at 4°C and not at 0°C as expected.

In a **pyramid** it generates a magnetic field that takes maximum effect penent the position in which you find its axis and can receive radiation.

### **Fluorescents and phosphorescent tubes:**

Radiation emission for atoms or molecules that have been excited by photon absorption.

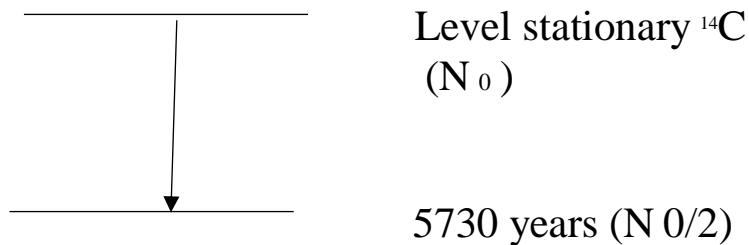
The time elapsed between the act of the excitement and the one of emission is of the order of  $10^{-5}$  and  $10^{-6}$  seconds (which distinguishes it from the phosphorescence).

In molecular compounds, both electronic excitation and subsequent dissipation of E can be accompanied by variations of the vibration, rotation, and translocation E, which makes the fluorescence radiation always greater than the wavelength exciting radiation (therefore, frequency or E is lower).

If the primary photons have enough energy and E · m levels is internal atoms of the sample transitions and why · is rearranged outermost levels of E minor produce secondary emission or fluorescence (which thing takes place in the form of spectral lines).

## $^{14}\text{C}$ Dates :

When life ceases, we stop acquiring or ingesting  $^{14}\text{C}$  and thereafter the amount of such an isotope decreases in the order of 5730 years, which represents half the amount or half life.



You can calculate the disintegration speed.

It is a linear function:  $-dN / dt = \lambda \cdot N$

Ctn of disintegration

It is negative because it is  
disintegrate

$$-dN / N = \lambda \cdot dt \quad \ln N / N_0 = -\lambda \cdot t$$

$$\ln [N_0 / (N_0 \cdot 2)] = \lambda \cdot t \quad (\text{average life time}) = 0.693 / \lambda$$

substituting for the medium-sized time (5730 years) we get the disintegration ctn. Then the schema of the function is "y = ax", where y = vel. of disintegration and x = amount or quantity. Then if we have a wood sample of a tree, measuring the disintegration velocity, we can predict when the tree (empirically) died.

## Terms of **industrial management**:

*Expenses (A) and earnings (B).*

In the long run,  $A < B$ , otherwise it would not be worth the business.

To the benefits ("A") and expenses ("B") we added the raw material ("C"), which was reduced x by including the recycling.

The cost of recycling must be lower than that of obtaining the raw material.

For example, recycling may be used for refuse oil from the kitchen for mechanical purposes and repair workshops, after appropriate treatment .

The benefit that is extracted must compensate.

*Sustainability:* to continue to maintain the source of living resources (such as trees) limited so that we can use them and not run.

Specific vocabulary:

Environment

Ecological value

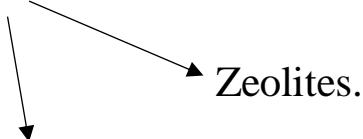
Recycling

Renewable waste

Waste

Here I will only touch **the case of the radicals .**

$M^{n+}$  → Born-Haber.



Radicals.

They can be eradicated with ions or polymeric reactions.

Free radicals are intermediaries of great importance in various processes and phenomena such as phtholysis, pyrolysis,

polymerization, oxidation (as well as environmental contamination).

### **Black holes and horizon of events:**

When existing suitable material in a star, habitually takes place its combustion generating energy and therefore light (It can be said that it shows signs of life).

As we know, when internalizing on any planet the nucleus is denser.

As the reserve is running out, it is gaining in heat, since, like a match, when consumed, it gives its last doses latent with more intensity.

Then, when there is no longer material remaining, the star goes out; There are some, however, that far from expiring, they choose to attract more substance from the outside and form a kind of loop: these are called black holes. In them, the space-time concept ceases to be any law, since depending on what they attract, they will continue to emit, and if they do not capture anything, time will not happen.

The horizon of events: the point from which the star begins to absorb fuel from the outside.

From the "big-bang", the expelled matter is forming galaxies, constellations, it is grouped, and it conforms itself and the gravitational and centrifugal forces are noticeable (in another section I will already speak of the The theory of relativity of Einstein regarding space). Only when a reasonable time has passed is when we can begin to talk about looking back (since we can not look back if only a tiny part of all "outer space" has been formed); And when I say that, I mean that what has happened already has a specific weight in the present. By doing so, you draw conclusions and stop seeing with subjective eyes and steps to understand everything in an objective manner. When you reach the convergence point it is like a kind of zenith.

## Other chemical phenomena VI:

**Glucose:** an important role in metabolism as a source of E.  
Satisfy 50% of man's capacities or energy needs.

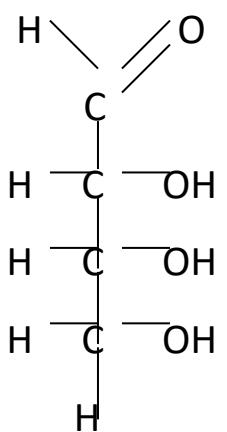
**Thieves of E:** every time we eat we spend E for the process of assimilation of food. If food is produced instantly, it is "polished" in a nothingness, however, if we eat substances that produce long-term E, E will not be lost when consuming them, but they can be substitutes for substantial calories.

### Carbohydrates, Proteins, Lipids, Nucleic Acids ...

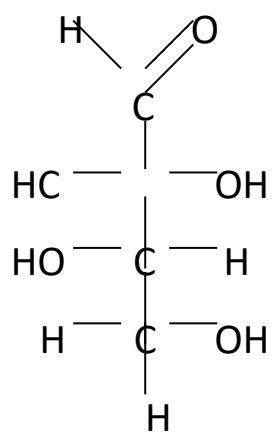
*Hydrated carbohydrates :* monosaccharides, disaccharides, polysaccharides ...

(fig.71) contain ketones or aldehydes in the terminations, and can be divided into Levogirs or Dextrogirs.

Fig.71:GLUCIDS (Carbon Hydrates)

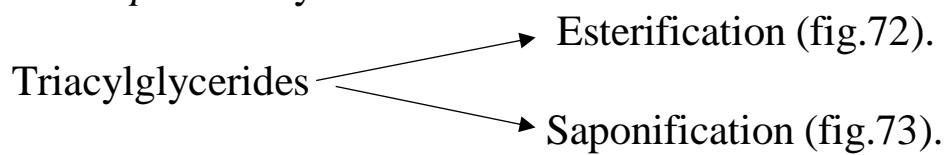


(D)



(L)

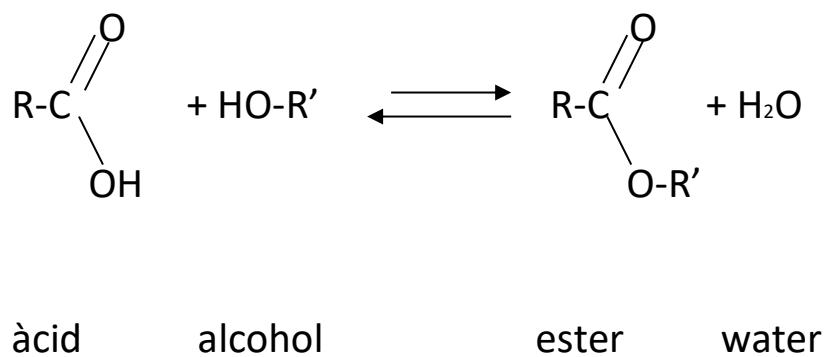
*Lipids:* fatty acids.



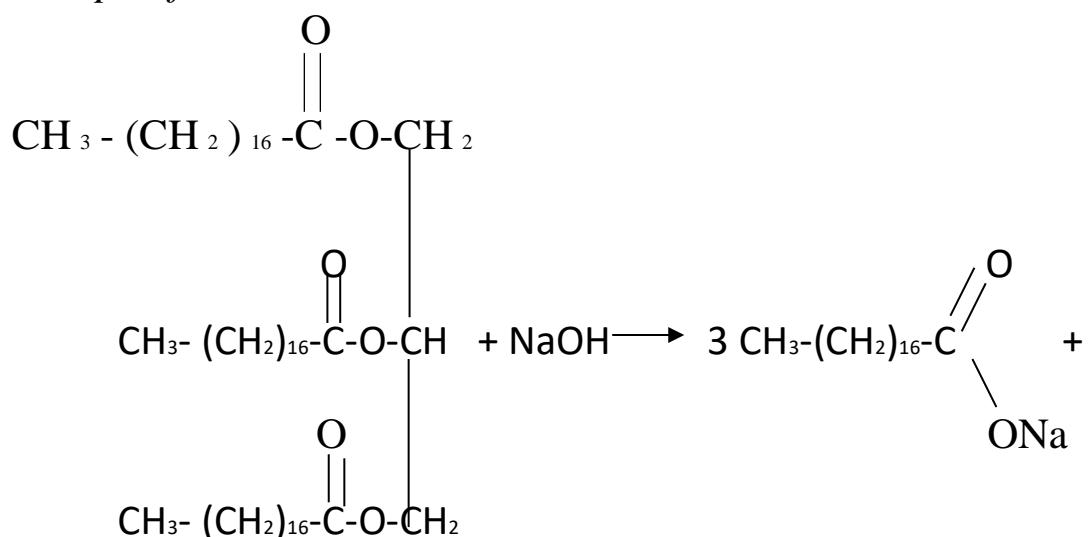
Figs. 72 and 73:

## LIPIDS

*Esterification:*



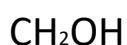
*Saponification:*



triestearina

sosa

triesterat sòdic



Glycerin

Ceres (waxes):

Phospholipids: → lipid components of the membranes

Sphingolipids

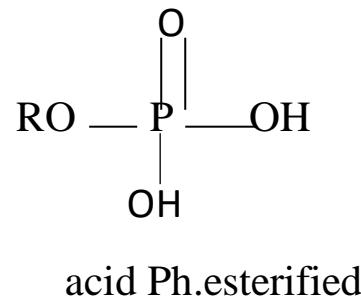
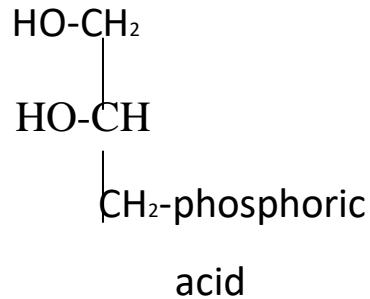
Steroids

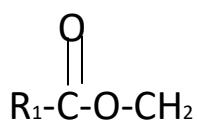
Cellular (fig.73 ')

Fatty acids + glycerin + phosphoric acid

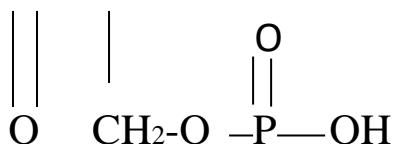
Fig. 73 ':

FATTY ACIDS + GLYCERIN + PHOSPHORIC ACID





|



where  $\text{R}_1$  i  $\text{R}_2$  are fatty acids

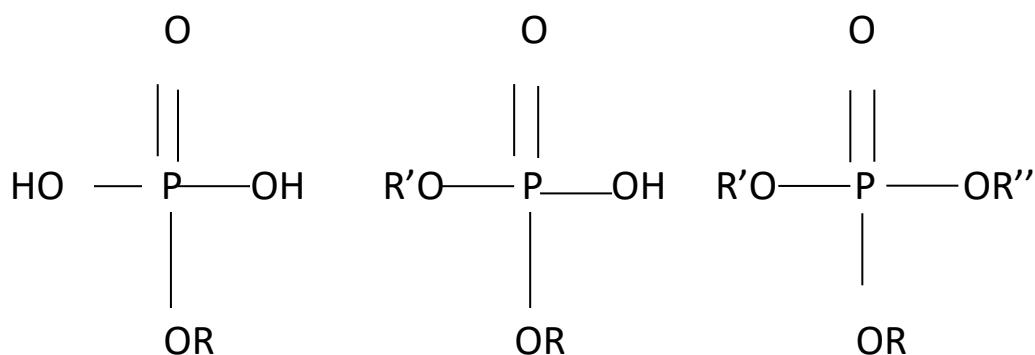
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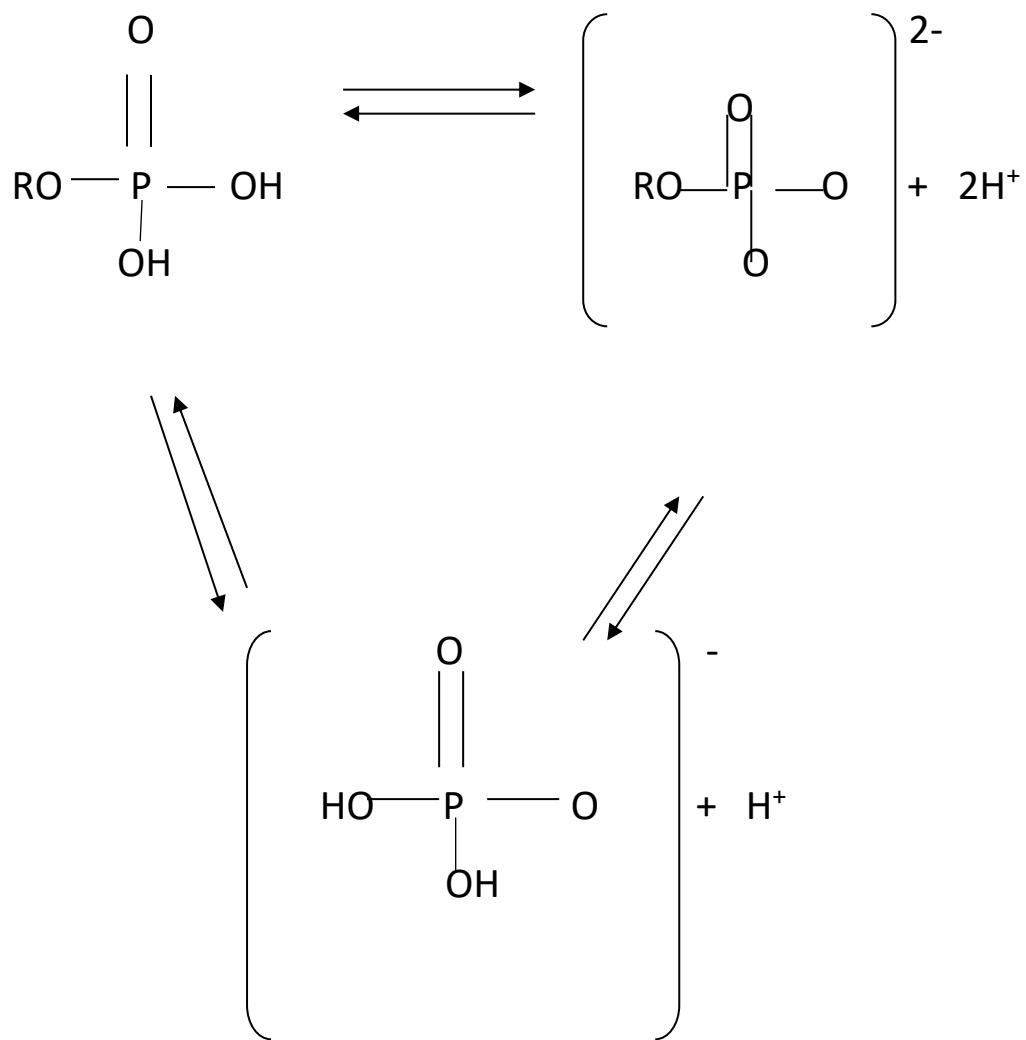


Glycerin may be saturated with acids  
fatty or not (unsaturated); while  
Phosphoric acid will be esterified

(Figure 74).

### PHOSPHORIC ESTERS:

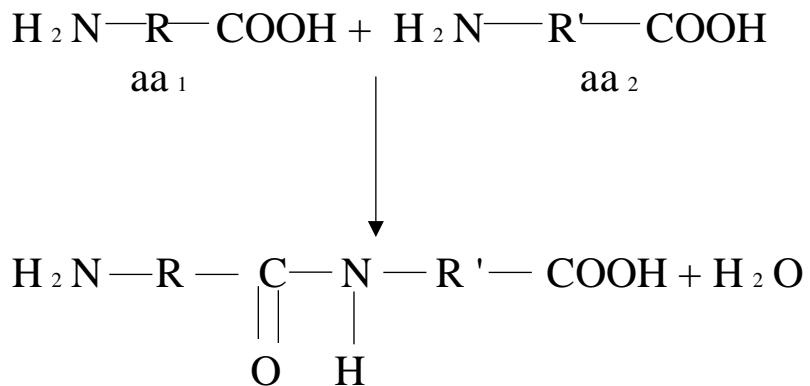




*Proteins:* Polypeptides: refers to the union of aa, which is called peptide bonding (long chains of amino acids).  
They are differentiated by their structural diversity, composition or form (fig.75).

Fig. 75:

## PROTEINS



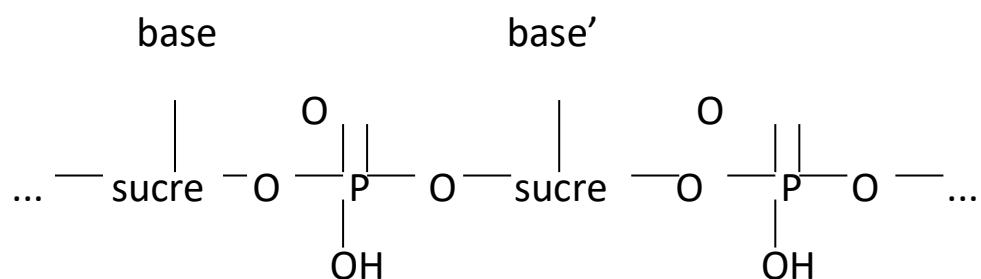
When in structural diversity, we can find primary, secondary, tertiary or quaternary proteins .

*Nucleic acids:* (fig.76). The bases can be Adenine, Guanina, Cytosine, Timina and Uracil.

Depending on whether the nucleic acid chain is DNA or RNA, we find that there are connections with  $\text{A} \equiv \text{T}$  and  $\text{C} \equiv \text{G}$  in the case of DNA and  $\text{A} \equiv \text{U}$  and  $\text{C} \equiv \text{G}$  in the case of RNA (knowing that RNA does not have Timina but Uracil).

Fig. 76:

## NUCLEIC ACIDS

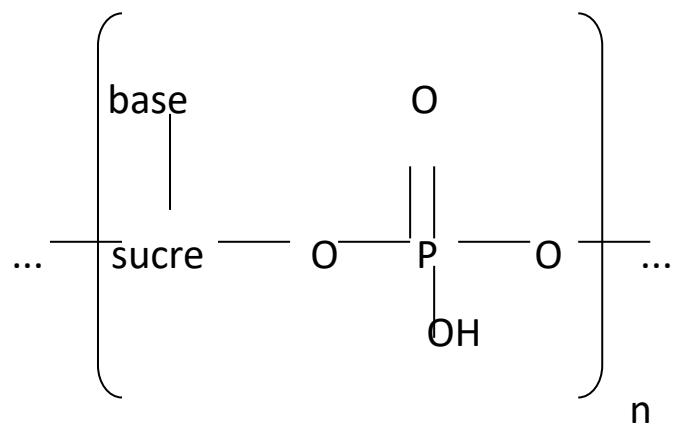


polinucleotidic chain

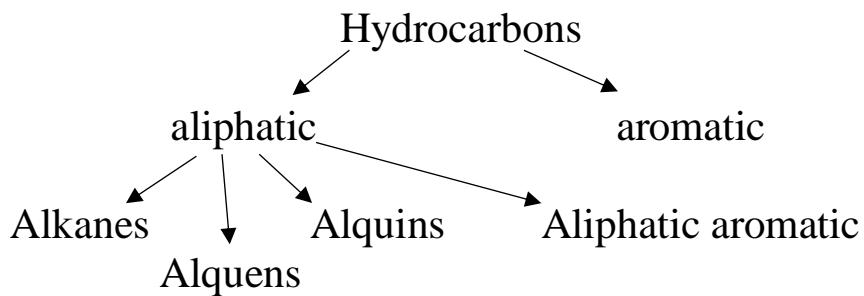
nucleòtid has the following structure: fig.77:

Fig. 77:

## NUCLEOTID



The nucleic acid is composed of sugars of 5 points as well as 6. Hydrates of Carbon or Hydrocarbons: they contain hydrogen and carbon and they are divided in aliphatic and aromatic:



**Penicillin:** a fungus that inhibits the growth of a certain number of pathogenic bacteria and presents a low toxicity to animals.

**Ferments:** enzymes responsible for transforming the foods we ingest into simpler molecules that can be absorbed into the intestine. There is alcoholic fermentation and lactic fermentation. The fermenter eliminates present oxygen and the bacteria are doing the job.

Yogurt is obtained from lactic fermentation of milk. Inoculated fermenting bacteria transform lactose into lactic acid.

**There are fruits** that carry sugar (such as melon, bananas ...) and others that basically carry vitamins.

### **Cell membranes:**

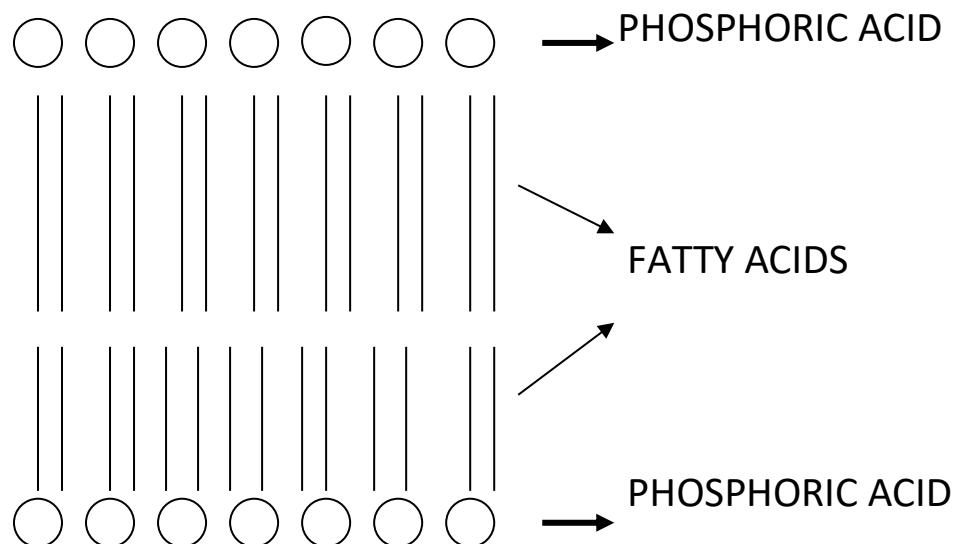
Hydrophilic part: it is the ionic dipole end (the phosphate group replaced with its positive and negative charges).

Hydrophobic part: it consists of long chains of fatty acids.  
In dissolution, I tend to exist as anions.

(fig.78)

Fig. 78:

## CELLULAR MEMBRANES



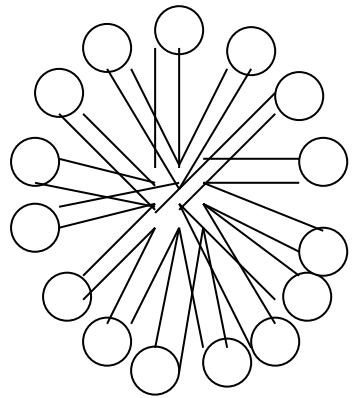
Fats in cell membranes tend to form double layers; It is possible to dissolve non-polar molecules in such a thickness between the 2 layers. Instead, it presents an effective barrier for polar molecules or ions.

Such double layers selectively control the passage of substances inward and outward (nutrients, waste products, hormones, and the nucleus intervening osmosis).

This is because polar and other strongly ionic molecules can cross such a double layer, thanks to proteins that make the duct between the cell membrane.

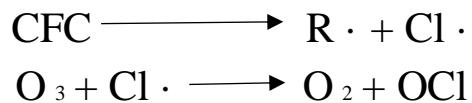
**Micelles:** we recall the issue of the solubility of the Greaves in fertilizers and detergents; They cover the fat or the lipidic particle with the hydrophobic part and leave the hydrophilic part in contact with it, thus disintegrating and dissolving the fats. (fig.79).

**Fig. 79:**  
**MICELES**



## Other chemical phenomena VII:

**Ozone layer** : it is a shield that *filters solar radiation* ; The CFC's destroy such a layer:



To high layers of the atmosphere to lose  $\text{O}_2$  to become  $\text{O}_3$ :



Where  $h\nu$  represents *ultraviolet radiation* and causes cancer since it generates radicals such as  $\text{O} \cdot$ .

$\text{O}_3$  , on the surface of the earth it is toxic and very oxyding.

**Acid Rain:** Obtained thanks to the waste from the chemical industries ( $\text{SO}_2$  ,  $\text{NO}$ ,  $\text{NO}_2$ ) and cover the pores where the plants take oxygen.

**Greenhouse effect** : gases that avoid the “flight” of heat.

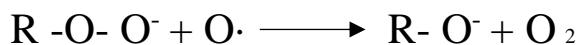
There are metals that neutralize radicals and eliminate them:



$O_3$  is oxidizing, which means that it transmits oxygen and also loses electrons in favor of its stability:



To conserve foods and prevent them from *rancid* we have antioxidants: any substance that slows or prevents oxidation either by covering the body avoiding contact with oxygen or by hijacking the catalysts of oxidation almost always present or:



Both tobacco and UV burn, because they use oxygen.