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STUDY ON BIOCHEMICAL NATURE OF ORGANIC COMPOUNDS WITH SPECIAL REFERENCE TO ORIGIN OF BIOLOGICAL MOLECULES LIPIDS, WAXES, PROTEIN OR THERE IMPORTANCE IN BIOLOGICAL ORIGIN

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ABSTRACT

Transfersome is a term registered as a trademark by the German company IDEA AG, used to refer to its proprietary drug delivery technology. The name means "carrying body", and is derived from the Latin word 'transferre', meaning „to carry across", and the Greek word „soma", for a „body". A Transfersome carrier is an artificial vesicle designed to be like acell vesicle or a cell engaged in exocytosis, and thus suitable for controlled and, potentially targeted, drug delivery. The term Transfersome and the underlying concept were introduced in 1991 by Gregor Cevc. Numerous groups have since been working with similar carriers, frequently under different names (elastic vesicle, flexible vesicle, Ethosome, etc.) to describe them.

In a broader sense, a Transfersome is a highly adaptable and stress-responsive, complex aggregate. Its preferred form is an ultradeformable vesicle possessing an aqueous core surrounded by the complex lipid bilayer. Interdependency of local composition and shape of the bilayer makes the vesicle both self-regulating and self-optimizing. This enables the Transfersome to cross various transport barriers efficiently, and then act as a Drug carrier for non-invasive targeted drug delivery and sustained release of therapeutic agents. The carrier aggregate is composed of at least one amphiphat (such as phosphatudylcholine), which in aqueous solvents self-assenbles into lipid bilayer that closes nto a simple lipid vesicle. Bby addition of at least one bilayer softening component (such as a biocompatible surfactant or an amphiphile drug) lipid bilayer flexibility and permeability are greatly increased. The resulting, flexibility and permeability optimised, Transfersome vesicle can therefore adapt its shape to ambient easily and rapidly, by adjusting local concentration of each bilayer component to the local stress experienced by the bilayer. In its basic organization broadly similar to a liposome), the Transfersome thus differs from such more conventional vesicle primarily by its "softer", more deformable, and better adjustable artificial membrane.

INTRODUCTION

In retrospect, the definition of chemistry has changed over time, as new discoveries and theories

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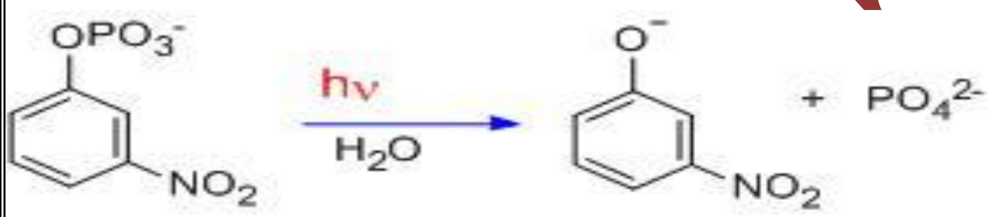
add to the functionality of the science. The term "chymistry", in the view of noted scientist Robert Boyle in 1661, meant the subject of the material principles of mixed bodies. In 1663, "chymistry" meant a scientific art, by which one learns to dissolve bodies, and draw from them the different substances on their composition, and how to unite them again, and exalt them to a higher perfection - this definition was used by chemist Christopher Glaser.

Transfer some is a term registered as a trademark by the German company IDEA AG, used to refer to its proprietary drug delivery technology. The name means ―carrying body‖, and is derived from the Latin word 'transferre', meaning ‗to carry across‘, and the Greek word ‗soma‘, for a ‗body‘. A *Transfersome* carrier is an artificial vesicle designed to be like acell vesicle or a cell engaged in exocytosis, and thus suitable for controlled and, potentially targeted, drug delivery.



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ETYMOLOGY

The word *chemistry* comes from the word *alchemy*, an earlier set of practices that encompassed elements of chemistry, metallurgy, philosophy, astrology, astronomy, mysticism and medicine; it is commonly thought of as the quest to turn lead or another common starting material into gold. Alchemy, which was practiced around 330, is the study of the composition of waters, movement, growth, embodying, disembodying, drawing the spirits from bodies and bonding the spirits within bodies (Zosimos). An alchemist was called a 'chemist' in popular speech, and later the suffix "-ry" was added to this to describe the art of the chemist as "chemistry

DEFINITION

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DISCOVERY

The term *Transfersome* and the underlying concept were introduced in 1991 by Gregor Cevc. Numerous groups have since been working with similar carriers, frequently under different names (elastic vesicle, flexible vesicle, Ethosome, etc.) to describe them.

In a broader sense, a *Transfersome* is a highly adaptable and stress-responsive, complex aggregate. Its preferred form is an ultradeformable vesicle possessing an aqueous core surrounded by the complex lipid bilayer. Interdependency of local composition and shape of the bilayer makes the vesicle both self-regulating and self-optimizing. This enables the*Transfersome* to cross various transport barriers efficiently, and then act as a Drug carrier for non-invasive targeted drug delivery and sustained release of therapeutic agents. The carrier aggregate is composed of at least one amphiphat (such as phosphatidylcholine).

SYNTHESIS

In organic synthesis, hemiacetals can be prepared in a number of ways:

- Nucleophilic addition of an alcohol to a carbonyl group of an aldehyde Nucleophilic
- addition of an alcohol to a resonance stabilized hemiacetal cation Partial hydrolysis
- of an acetal

Reactions

Hemiacetals and hemiketals may be thought of as intermediates in the reaction between alcohols and aldehydes or ketones, with the final product being an acetal or a ketal:

$-C{=}O + 2\ ROH \rightleftharpoons -C(OH)(OR) + ROH \rightleftharpoons -C(OR)_2 + H_2O$

A hemiacetal can react with an alcohol under acidic conditions to form an acetal, and can dissociate

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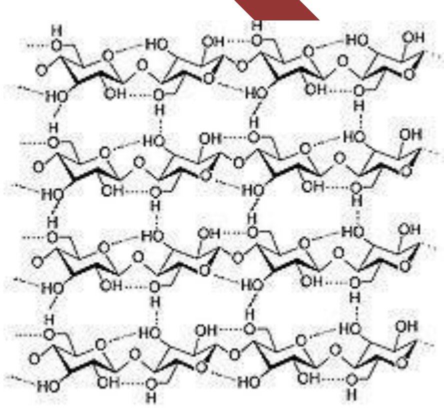
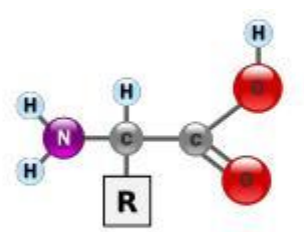
to form an aldehyde and an alcohol.

hemiacetal + alcohol (excess) + acid (catalyst) ↔ acetal + water
An aldehyde dissolved in water exists in equilibrium with low concentrations of its hydrate, R-$CH(OH)_2$. Similarly, in excess alcohol, the aldehyde, its hemiacetal, and its acetal all exist in solution.

Cellulose is an organic compound with the formula (C6H10O5)n, a polysaccharide consisting of a linear chain of several hundred to over ten thousand β(1→4) linked D-glucose units. Cellulose is an important structural component of the primary cell wall of green plants, many forms of algae and the oomycetes. Some species of bacteria secrete it to form biofilms. Cellulose is the most abundant organic polymer on Earth. The cellulose content of cotton fiber is 90%, that of wood is 40–50% and that of dried hemp is approximately 45%.Cellulose can be converted into cellophane, a thin transparent film, and into rayon, an important fiber that has been used for textiles since the beginning of the 20th century. Both cellophane and rayon are known as "regenerated cellulose fibers"; they are identical to cellulose in chemical structure and are usually made from dissolving pulp via viscose. A more recent and environmentally friendly method to produce a form of rayon is the Lyocell process. Celluloseis the raw material in the manufacture of nitrocellulose (cellulose nitrate) which is used in smokeless gunpowder and as the base material for celluloid used for photographic and movie films until the mid-1930s

Cellulose source and energy crops: The major combustible component of non-food energy crops is cellulose, with lignin second. Non-food energy crops produce more usable energy than edible energy crops (which have a large starch component), but still compete with food crops for agricultural land and water resources.[17] Typical non-food energy crops include industrial hemp (though outlawed in some countries), switchgrass, *Miscanthus*, *Salix* (willow), and *Populus* (poplar) species



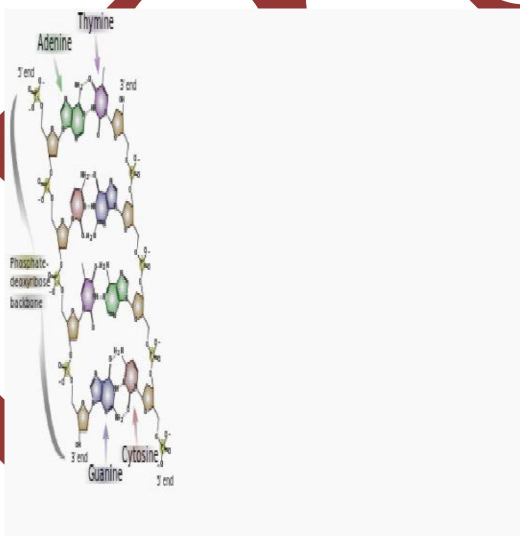


Proteins

Proteins are very large molecules – macro-biopolymers – made from monomers called *amino acids*. There are 20 standard amino acids, each containing a carboxyl group, an amino group, and a side-chain (known as an "R" group). The "R" group is what makes each amino acid different, and the properties of the side-chains greatly influence the overall three-dimensional conformation of a protein. When amino acids combine, they form a special bond called a peptide bond through dehydration synthesis, and become a *polypeptide*, or protein. In order to determine whether two proteins are related, or in other words to decide whether they are homologous or not, scientists use sequence-comparison methods. Methods like Sequence Alignments and Structural Alignments are powerful tools that help scientists identify homologies between related molecules

Nucleic acids

Nucleic acids are the molecules that make up DNA, an extremely important substance that all cellular organisms use to store their genetic information. The most common nucleic acids are deoxyribonucleic acid and ribonucleic acid. Their monomers are called nucleotides. The most common nucleotides are adenine, cytosine, guanine, thymine, and uracil. Adenine binds with thymine and uracil; Thymine binds only with adenine; and cytosine and guanine can bind only with each other



MATERIAL AND METHOD

Methylene-Interrupted Polyenes

These fatty acids have 2 or more *cis* double bonds that are separated from each other by a single methylene bridge (-CH 2- unit). This form is also sometimes called a*divinylmethane pattern*.

Methylene- interrupted double bonds

−C−C=C−C−C=C−

The essential fatty acids are all omega-3 and -6 methylene-interrupted fatty acids. *See more at Essential fatty acids—Nomenclature*

Omega-3

An approximate chemical formula for beeswax is $C_{15}H_{31}COOC_{30}H_{61}$. Its main components are palmitate, palmitoleate, and oleateesters of long-chain (30-32 carbons) aliphatic alcohols, with the ratio of triacontanyl palmitate $CH_3(CH_2)_{29}O\text{-}CO\text{-}(CH_2)_{14}CH_3$ to cerotic acid $CH_3(CH_2)_{24}COOH$, the two principal components, being 6:1. Beeswax can be classified generally into European and Oriental types. Thesaponification value is lower (3-5) for European beeswax, and higher (8-9) for Oriental types.

Beeswax has a relatively low melting point range of 62 to 64 °C (144 to 147 °F). If beeswax is heated above 85 °C (185 °F) discoloration occurs. The flash point of beeswax is 204.4 °C (399.9 °F). Densityat 15 °C is 958 to 970 kg/m³.

Uses

Tallow is used mainly in producing soap and animal feed.

Production of biodiesel

Tallow can be used for the production of biodiesel in much the same way as oils from plants are currently used. Because tallow is derived from animal by-products which have little to no value it avoids some of the food vs. fuel debate.

Food

A significant use of tallow is for the production of shortening. It is one of the main ingredients of Native American food called pemmican. Before switching to pure vegetable oil in 1990, the

McDonald's corporation cooked its French fries in a mixture of 93% beef tallow and 7% cottonseed oil. Currently, McDonald's French fries and hash browns contain

Other uses

Sealing wax was used to close important documents in the Middle Ages. Wax tablets were used as writing surfaces. There were different types of wax in the Middle Ages, namely four kinds of wax (Ragusan, Montenegro, Byzantine and Bulgarian), "ordinary" waxes from Spain, Poland and Riga, unrefined waxes and colored waxes (red, white and green). Waxes are used to make wax paper, impregnating and coating paper and card to waterproof it or make it resistant to staining, or to modify its surface properties. Waxes are also used in shoe polishes, wood polishes, and automotive polishes, as mold release agents in mold making, as a coating for many cheeses, and to waterproof leather and fabric. Wax has been used since antiquity as a temporary, removable model in lost-wax casting of gold, silver and other materials.

Wealing wax is a wax material of a seal which, after melting, quickly hardens (to paper, parchment, ribbons and wire, and other material) forming a bond that is difficult to separate without noticeable tampering. Wax is used to verify something such as a document is unopened, to verify the sender's identity, for example with a signet ring, and as decoration. Sealing wax can be used to take impressions of other seals. Wax was used to seal *letters close* and later, from about the 16th century, envelopes. Before sealing wax, the Romans used bitumen for this purpose.

Biological function

Currently there is disagreement on what biological purpose or purposes spermaceti serves. It might be used as a means of altering the whale's buoyancy, since the density of the spermaceti alters with its phase. Another hypothesis has been that it is used as a cushion to protect the sperm whale's delicate snout while diving. The whale's head may be used as a ram, perhaps to stun its prey, but that does not seem to account for the unusual properties of this substance.

The most likely primary function of the spermaceti organ is to add internal echo or resonator clicks to the sonar echo location clicks emitted by the respiratory organs. This makes it possible for the whale to sense the motion of its prey as well as its position. The changing distance to the prey affects the time interval between the returning clicks reflected by the prey (doppler effect). This would explain the low density and high compressibility of the spermaceti, which enhance the resonance by the contrast of the acoustic.

RESULTS

Sample Sample wt Blank reading Sample reading Peroxide valuePalm oil 1.0214 g 0.4 mL 1.2 mL

783.2

DISCUSSION

Unsaturated oils are particularly susceptible to oxidation, developing peroxide under poorstorage conditions. Peroxides are the precursors of breakdown products that cause rancid flavorsin fat. The concentration of peroxides is indicative of oxidation during the early stages of lipiddeterioration. This index becomes less reliable during the later stage of deterioration, becauseperoxide degradation increases.

Peroxide value is defined as the milliequalivalants of peroxidises per kilo gram of sample. It istitrimetric determination (Owen R. Fennema., 1996) (The peroxide value is defined as thereactive oxygen contents expressed in terms of milliequivalant (meq) of free iodine perkilograms of fat. It is determined by titrating iodine liberated from KI with sodium thiosulphatesolution)Oils with peroxide value well below 10 meq/Kg are considered fresh. A rancid taste begins to benoticeable when peroxide value is between 20-40 meq/Kg. in interpreting such figures; howeverit is necessary to take into account the particular oil or fat involved.The peroxide value is determined by measuring the amount of iodine which is formed by thereaction of peroxides (formed in fat or oil) with iodide ion.2 I

CONCLUSION

Biochemistry is the study of the chemical substances and vital processes occurring in living organism. Biochemists focus heavily on the role, function and structure of biomolecules. The study of the chemistry behind biological processes and the synthesis of biologically active molecules are examples of biochemistry.

- *Genetics* is the study of the effect of genetic differences on organisms. Often this can be inferred by the absence of a normal component (e.g., one gene). The study of "mutants" – organisms with a changed gene that leads to the organism being different with respect to the so-called "wild type" or normal phenotype. Genetic interactions (epistasis) can often confound simple interpretations of such "knock-out" or "knock-in" studies.

- *Molecular biology* is the study of molecular underpinnings of the process of replication, transcription and translation of the genetic material. The central dogma of molecular biology where genetic material is transcribed into RNA and then translated into protein, despite being an oversimplified picture of molecular biology, still provides a good starting point for understanding the field. This picture, however, is undergoing revision in light of emerging novel roles for RNA.

- *Chemical Biology* seeks to develop new tools based on small molecules that allow minimal perturbation of biological systems while providing detailed information about their function. Further, chemical biology employs biological systems to create non-natural hybrids between biomolecules and synthetic devices (for example emptied viral capsids that can deliver gene therapy or drug molecules).

Researchers in biochemistry use specific techniques native to biochemistry, but increasingly combine these with techniques and ideas developed in the fields of genetics, molecular biology and biophysics. There has never been a hard-line between these disciplines in terms of content and technique. Today, the terms *molecular biology* and *biochemistry* are nearly interchangeable. Lipids consist of a broad group of compounds that are generally soluble in organic solvents but only sparingly soluble in water. Lipids in food exhibit unique physical and chemical properties. Their composition, crystalline structure, melting properties and ability to associate with water and other non-lipid molecules are especially important to their functional properties in many foods. During the processing, storage and handling of foods, lipids undergo complex chemical changes and react with other food constituents, producing numerous compounds both desirable and deleterious to food quality. Cooking oil includes the well-known olive, sunflower, and canola oils and the not so well-known coconut, soy, and palm oils. Palm oil is similar to coconut. Because of its highly saturated, it isused to make shortening and frying oil.

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Viscosity is the thickness of oil. Viscosity is determined by measuring the amount of time taken for a given measure of oil to pass through an orifice of a given size. Density is determined by weighing a given measure of oil. Oils that are denser will contain more energy. For example petrol and diesel fuel give comparable energy by weight but diesel is denser and gives more energy per litre. The density of the oils.

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