GOLDEN MEAN HARMONIZED WATER AND AQUEOUS SOLUTIONS

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ABSTRACT
A composition of mater comprising a harmonized cluster of water molecules with Fibonacci chains between them and ordered water molecules based on hydrogen bonds that each water molecule interacts with three other water molecules having a magnetic spectra as shown in FIG. 13 or FIG. 14.
FIG. 2  

\[ a + b \]  

\[ a + b \text{ is to } a \text{ as } a \text{ is to } b \]
FIG. 13

11: T(P+V3+Mg, 15h)

AMPLITUDE

TIME
FIG. 18

1 

212

b)

1+ \frac{1}{1} = 2

212

214

c)

1+ \frac{1}{1+1} = \frac{3}{2}

212

216

d)

1+ \frac{1}{1+1} = \frac{5}{3}

212

216

e)

1+ \frac{1}{1+1} = \frac{8}{5}

212

216

218

f)

1+ \frac{1}{1+1} = \frac{13}{8}

212

216

218

220

222

229
### FIG. 24

| $|||_h$ | $E_{12C_5}$ | $12C_5$ | $12C_5^2$ | $20C_3$ | $15C_2$ | $i$ | $12S_{10}$ | $12S_{10}^3$ | $20S_6$ | $20S_6$ |
|-------|------------|--------|--------|--------|--------|------|-----------|-----------|--------|--------|
| 1     | 1          | 1      | 1      | 1      | 1      | 1    | 1         | 1         | 1      | 1      |
| 2     | 3          | $1/2(1+\sqrt{5})$ | $1/2(1-\sqrt{5})$ | -1     | 0      | 0    | -1        | 0         | -1     | 0      |
| 3     | 3          | $1/2(1+\sqrt{5})$ | 0       | 0      | 0      | 0    | 0         | 0         | 0      | 0      |
| 4     | 4          | $1/2(1-\sqrt{5})$ | 0       | 0      | 0      | 0    | 0         | 0         | 0      | 0      |
| 5     | 5          | 0       | 0      | 0      | 0      | 0    | 0         | 0         | 0      | 0      |

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GOLDEN MEAN HARMONIZED WATER AND AQUEOUS SOLUTIONS

CROSS-REFERENCE TO RELATED APPLICATION


BACKGROUND OF THE INVENTION

[0002] 1. Technical Field
[0003] The present invention provides harmonized water and aqueous solutions containing harmonized water, harmonized hydroxyl fullerenes, fullerenes thin films, and other beneficial additives. What is meant by the term “harmonized” is that ratio of two quantities obeys the golden mean ratio.
[0004] 2. Background Art
[0005] Schrödinger’s book What is Life? has had an enormous influence on the development of molecular biology, stimulating scientists such as Crick and Watson to explore the double helix structure of DNA as the basis of life (Schrödinger 1943, Watson and Crick, 1953). One of the central points in the book is statement “that the most essential part of a living cell—the chromosome fiber—may suitably be called an aperiodic crystal” as opposed to a periodic crystal in classical physics. It has been found that DNA works as a classical information system based on a double helix structure and a ternary coding system with 4\(^3\)=64 coding words [Crick, 1963]. Many years later it was recognized that that the genetic ternary code, which codes for amino and imino acids in proteins, also, may be represented as a classical binary code 2\(^n\)=64 [Swanson, 1984; Doolittle, 1981, Rakoczevich, 1998].
[0006] Based on information coding theory, a binary system is useful for energy-information coding system (e.g., on-off energy switch system of neurons, computers, etc.), while a ternary system is useful for structure-information code (DNA, RNAs: three nucleate acids coding one amino acid, etc.). However, for integral structure-energy-information (SEI) systems, like biological systems, the optimal coding system is neither binary nor ternary but one based on base e=2.71828. To support mapping binary DNA energy-information code (physical signalling system) to a ternary DNA structure-information system (chemical signalling system via DNA, RNA and RNA to protein chain) a bridging coding system has to exist with base e. Bearing in mind that there are 20 amino acids we believe the SEI coding system should be ln(20)-ln(e\(^2\)). The present inventor submits that clusters of water molecules fill this SEI row as water molecules through a hydrogen bonding network can code with a base of 2.71441 which closely approximates the ideal base value e=2.7182. The importance of hydrogen bonding in the structure and function of biological macromolecules was predicted by the earliest investigators (Pauling, Corey, and Brandon, 1951). According to L. I. I. Pauling, the first prediction of the existence of a hydrogen bond should be assigned to M. L. Huggins in 1919 and independently to W. M. Latimer and W. H. Rodebush in 1920. Bearing in mind that most biological systems contain water from 60% to 80%, the importance of hydrogen bonds has become most relevant for understanding how biomolecular machinery, as a complex system, works.

Within a collection of water molecules, the hydrogen atom is covalently bound to an oxygen atom in the water molecule and hydrogen bonds with oxygen atoms on separate water molecules. It is well known that covalent bond may only be described by quantum mechanics, because each electron does not really belong to a single atom—it belongs to both simultaneously. For a long period of time, scientists believed that the hydrogen bond could be perfectly understood by the principles of electrostatic interactions using Coulomb’s law (pre-20\(^{th}\) century classical physics), based on the attraction and repulsion between charged particles separated from each other by a distance. However, recent experimental data indicate that a hydrogen bond has double identity: classical and quantum (Isaacs, 1999, Barbieri, and Shukla, 2003). This is the key point for understanding a new approach to explaining how DNA and proteins function in water. It has been shown that water itself may be a coding structure, via its hydrogen bonds, if some water molecules are organized in clusters and some of them are ordered in interconnected chains between water clusters by Fibonacci law. Some local domains of water, under the influence of DNA and microtubules, may be responsible for organizing water molecules into clusters as complementary coding forms. In a human, 40% of it is water free water, while 60% is captured by biomolecules. Estimates predict that only 5% of free water is in clusters organized by a sphere packing law of coding number 12. The remaining 95% of free water is in the form of “chaos” with local polymerized islands.

[0007] According to a coding approach based on sphere packing analysis, the optimal molecular organization of water molecule as clusters should be as a hydrogen-bonded (H\(_2\)O)\(_n\) polyhedra 5\(^1\)/6\(^\circ\) (n=0, 2, 4, . . .), where 5\(^1\)/6\(^\circ\) represents 12 pentagons and a different number of hexagons (Jeffrey, 1997). Through hydrogen bonding dynamics, this polyhedra-shaped structure of a cluster of water molecules is capable of a spherical coding system 2\(^n\)=32. The arrangement of water molecules, based on the number 12, may represent a coding system which is part of an optimal information peak of sphere packing (Skolne 1984, Konruga, 1986). Accordingly, water hydrogen-bonded polyhedra (2\(^n\)) and hydrogen bonding chains network (n=20) is both compatible and complementary with the coding system of the genetic code (DNA and proteins).

[0008] An understanding of the hydrogen bonding dynamic on quantum chemical scales is useful in the study of biological systems, including the study of diseases such as cancer and medical and cosmetic conditions related to the human skin. By way of background with regard to the human skin, the epidermis is a dynamic renewing structure that provides life-sustaining protection from the environment. Keratinocytes and melanocytes are the major cells types responsible for the structure of the epidermis. They begin as stem cells in the basal epidermal layer. As keratinocytes move to the epidermal surface, the cells cease cell division and undergo morphological changes to form the prickle or spiny cells, granular cells, transition cells, keratinized squames and surface squames. One melanocyte cell may overlap a few keratinocytes giving them melanin (mechanism is yet unknown), which is responsible for protection of the environmental electromagnetic radiation (UV radiation) and neutralization of free radicals (Varni et al., 2004, van den Bosseke, et al., 2006).

[0009] It is also well known that vitamin C (L-ascorbic acid) can be used in the treatment of conditions related to the skin. One of the major roles of vitamin C is its stimulation
effects on collagen synthesis without affecting other protein synthesis. Vitamin C is a desired component of cosmetic products for both praline and lysine hydroxylase which stabilize the collagen molecule. This reaction is necessary for skin to maintain its strength.

[0010] Also, collagen distortion below the base level membrane (lamina fibroreticularis) occurs when cancer penetrates through the epidermis into the dermis, and “opens the door” for metastases. From a classical communication channels point of view, gene expression is responsible for it: normal collagen, type I α1(1), α2(1), comprises two procollagen chains, the first α1(1) (gene located on chromosome 17 q21-q22), and the second procollagen chain α2(1) (gene located on chromosome 7 q21-q22). According to quantum theory, quantum communication channels exist among keratinocyte or melanocyte and fibroblast cells (entanglement) based on hydrogen bonding in the DNA. When symmetry-breaking of hydrogen bonds happens in DNA, then automatically, through DNA-microtubule-water coding entanglement, synergy of classical and quantum communication is broken. There is experimental evidence that fibroblast cells and human melanoma cells interact with tumour cell growth as a function of tumour progression (Cooms, at. al. 1991). If UV radiation damages DNA on chromosome 7, in keratinocyte or melanocyte cells, then through non-classical quantum channels this information will transfer to both centriole (damaged cell) and fibroblast cells in the region. The centriole will become “wild” (from bipolar mitosis change to three polar or multipolar mitosis) and will start to divide chromosomes irregularly. The nucleus of an initial cancer cell will grow faster than normal cells. The “wild” cell will be duplicated and rapidly increase in number because positive feedback control mechanism water-centriole will change perpendicularly to centriole pairs (Koruga, et al. 1992). From another side, fibroblast cells will cease synthesizing collagen α2(1). In the absence of α2(1), procollagen chains during assembly into procollagen molecules, will incorporate an additional α1(1) procollagen chain. This will give collagen type I-trimer with a structure [α1(1)3]. The 1-trimer links between procollagen chains do not fit well, and OH groups will be removed from collagen to make free water molecules. The volume of free water will increase from 20% in tissue (Foster and Schwan, 1986). A similar occurrence is observed in skin aging an accounts for the reason for people of advancing age frequently having cancer (Richard, et al., 2004).

[0011] When this type of collagen becomes dominant in a given tissue, the lamina fibroreticularis (as a “woof” of basal lamina) becomes weak, because the interconnection between procollagen chains in procollagen molecules, based on hydrogen bonds, is not adequate (the electromagnetic shield of a basal membrane has holes). Then, a mass of skin cancer or melanoma, can penetrate the basal lamina and reach the superficial arteriogenous plexus (Brinkley, 2001).

[0012] Hydrogen bonding in biomolecule networks in cell and tissue, as well as their complex intermolecular connections, resemble spider webs. It is a link between classical and quantum behaviour of matter on molecular level, and it is a basic element of synergy between mass-energy and information in living matter.

[0013] DNA is coded by 4th perfect number code 20(2n−1) − with 8128 code words (n=6), which is responsible for protein coding (classical) and system complexity coding (quantum) by entanglement (Koruga, 2005, Koruga, et al. 2006). There is mapping one-to-one from genetic code to proteins by synergetic code. There is synergetic code (classical/quantum) in protein chain based on amino acids and peptide plans. Hydrogen bonds are links between classical and quantum behaviours of matter on a molecular level, and it is a basic element for synergy of mass-energy-information in living matter.

[0014] Understanding DNA as synergetic classical/quantum device, based on golden mean and the forth perfect number, may help us not only for better understanding of the origin of life, but also for finding methods for prevention and healing the most illnesses. Bearing in mind that proteins are the second side of DNA code, interaction and communication DNA-protein may be both through separate classical and quantum communications channels, and through synergetic one. However, synergetic approach, which we proposed open a new possibilities for therapy of many skin illnesses including cancer.

[0015] DNA and water exist in a very delicate relationship. In normal situations, DNA operates in accordance with the fourth perfect number law 20(2n−1)=8128, where n=6, while ordinary water (drinking water) operates in accordance with the third perfect number law 20(2n−1)=496, where n=4. In normal situations, the DNA-water system works harmonically. However, when, for some reason, DNA collapses from operating in accordance with the fourth perfect number law to the third perfect number law 20(2−1)=2−2(2−1), for n=6, then information about the disharmonic state of DNA travels more smoothly through water than its harmonic one. It happens because both structures, DNA and water, as information entities, operate by same perfect number. To address this negative event water has to change its structure to be harmonized. That means water has to change form of the third perfect number form 20(2−1)=496, where n=4] to [20−1(2−1)=496, where n=5. Since 2−1 or 2−n represents classical coding law of water by hydrogen bonds, while 2−1 or 2−n represents quantum coding law of water by hydrogen bonds, that means that to protect from such negative events of DNA disorder (and repairing it) water has to be clustered in dodecahedral and icosahedral polyhedra and connected by Fibonacci water chains.

[0016] These and other aspects and attributes of the present invention will be discussed with reference to the following drawings and accompanying specification.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIG. 1a is a diagrammatic view of a C60 fullerene molecule;

[0018] FIG. 1b is a diagrammatic view of a C60(OH)24 molecule;

[0019] FIG. 2 is a diagrammatic representation of a Golden Mean Rule in one dimension;

[0020] FIG. 3a is a diagrammatic view of general internal hydrogen bonding in a protein (healthy bonding);

[0021] FIG. 3b is a diagrammatic view of external hydrogen bonding in a protein (unhealthy bonding);

[0022] FIG. 4 is a diagrammatic view of a hydroxyl-modified fullerene scavenging a water molecule to return the protein to a healthy state shown in FIG. 3a;

[0023] FIG. 5 is a diagrammatic view of a five-water-molecule cluster showing that the ratio of the length of an O—H covalent bond to the length of a hydrogen bond obeys the golden ratio;

[0024] FIG. 6a is a diagrammatic representation of a cluster of electrons in the ground state;
FIG. 6b is a diagrammatic representation of the cluster of electrons in an excited state resulting from applying energy to the electron cluster shown in FIG. 6a;

FIG. 6c is a diagrammatic representation of an electron cloud in an excited state forming a flower pattern as a result of the electron cluster of FIG. 6a to a harmonization process;

FIG. 7 is a $^{13}$C NMR spectra for a hydroxyl modified fullerene $C_{60}(OH)_{24}$;

FIG. 8 is a $^{13}$C NMR spectra for a harmonized, hydroxyl modified fullerene $C_{60}(OH)_{30}$;

FIG. 9 is a diagrammatic view of a $C_{60}(OH)_{24}$ in water showing three levels of hydrogen bonding;

FIG. 10 is a graph of anisotropy (%) vs. electron momentum (p) with an inset graph of electron dislocation intensity (arb vs. distance (Å));

FIG. 11 spectra showing temporally magnetic oscillation of tap water with high ion concentration based on diamagnetic (decreasing) and paramagnetic (increasing) magnetic field resulting from proton magnetometer studies;

FIG. 12 spectra showing temporally magnetic oscillation of water with low ion concentration diamagnetic (decreasing) and paramagnetic (increasing) magnetic field resulting from magnetometer studies;

FIG. 13 spectra showing temporally magnetic oscillation of water with high ion concentration (FIG. 11) after treatment of the water with a harmonization process showing a difference in the magnetic properties of about 0.28 nT;

FIG. 14 spectra showing temporally magnetic oscillation of water with low ion concentration (FIG. 12) after treatment of the water with a harmonization process showing a difference in the magnetic property of about 0.55 nT;

FIGS. 15a, b, c are diagrammatic representations of three-water-molecule clusters in three different hydrogen bonding conformations;

FIGS. 16a, b, c are diagrammatic representations of four-water-molecule clusters in three different hydrogen bonding conformations;

FIGS. 17a, b, c, d are diagrammatic representations of five-water-molecule clusters in three different hydrogen bonding conformations;

FIG. 18a–f shows a diagrammatic view of a progression of one water molecule to a six-water-molecule chain with a continued fraction representation of the golden ratio for the individual molecule (FIG. 18a) and each of a chain of molecules (FIG. 18f);

FIG. 19 is a diagrammatic view of a chain of water molecules having terminal three-water-molecule clusters, with each molecule in the chain having a fractional representation of the solution of the golden ratio;

FIG. 20 is a graph showing a golden ratio increasing in value with the solution of the golden ratio on the y-axis;

FIG. 21 is a diagrammatic view of a cluster of water molecules forming a regular polyhedron having 12 pentagonal faces with each vertex having three intersecting pentagons to form a water cluster having icosahedral symmetry;

FIG. 22 is a diagrammatic view of a plurality of icosahedral water clusters linked together by chains of water molecules that obey the Fibonacci law;

FIGS. 23a, b are respectively a diagrammatic view of a water cluster having icosahedral symmetry interacting with a protein in an unhealthy bonding (FIG. 23a) state and scavenging a water molecule to return the protein molecule to a healthy bonding state (FIG. 23b);

FIG. 24 is a multiplication table of the energy-symmetry relationship for icosahedral group with golden mean ratio for $T_{1g}$, $T_{2g}$, $T_{1u}$ and $T_{2u}$ energy states and $C_5$, $C_{10}$, and $S_{10}$ symmetries;

FIG. 25a is a diagrammatic representation of a cluster of π-electrons (electron cloud) of a $C_{60}$ in the ground state;

FIG. 25b is a diagrammatic view of a $C_{60}$ thin film showing a π-electron cloud;

FIG. 25c is a diagrammatic representation of a $C_{60}$ thin film showing a π-electron cloud in an excited state resulting from the input of diffused light energy on one surface of the thin film structure and an output of harmonized light from an opposite surface of the film structure;

FIG. 25d is a diagrammatic representation of a harmonized light pathway passing through the eyes of a human subject, then through the optical nerve to the hypothalamus and finally the visual cortex;

FIGS. 26a–c are diagrammatic representations of diffusion light, polarizing light and harmonizing light, respectively;

FIGS. 27a, b are photographs taken by a digital camera without a filter and with a harmonized glass filter respectively;

FIGS. 28a, b are EEG plots before and after exposure of a subject to harmonized light;

FIGS. 29a, b are photographs of an epidermis of a human subject before and after exposure to harmonized light;

FIGS. 29c, d are photomicrographs (1 cm$^{-1}$–50 μm) of collagen before and after exposure of a human subject to harmonized light, respectively; and

FIGS. 29e, f are photomicrographs 1 cm$^{-1}$–50 μm of elastin before and after exposure of a human subject to harmonized light, respectively.

DETAILED DESCRIPTION OF THE INVENTION

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings, and will be described herein in detail, specific embodiments thereof with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the specific embodiments illustrated.

FIG. 1a and FIG. 25 show a $C_{60}$ fullerene composed entirely of carbon atoms in the form of a hollow sphere in the shape of the familiar black and white soccer ball (Telstar 1970) and has icosahedral symmetry (Ih). Fullerenes comprise a family of carbon allotropes containing from 20 to 1000 or more carbon atoms in each cage-like structure. The structure of $C_{60}$ fullerene is a truncated icosahedron having 20 hexagon faces 12, 12 pentagon faces 14, all single bonds along pentagon perimeters 16, one double bond 18 and 2 single bonds per carbon atom. Accordingly, the icosahedral $C_{60}$ fullerene will sometimes be referred to as (C$_{60}$)$_{12}$[5,6] fullerene. Other suitable fullerenes have the formula (C$_{x}$-Ih)$_{12}$[5,6] fullerene where $X$ is a number of carbon atoms which allow for the cage to have icosahedral symmetry and include but are not limited to 80, 140, 180, 240, 260, 320, 380, 420, 500, 540, 560, 620, 720, 740, 780, 860, 960, and 980.

Harter, 1989)

The $C_{60}$ has two bond lengths. A first bond length is along the edges of two hexagons and the second bond length is between the edge of a hexagon and a pentagon, the first
bond length being greater than the second bond length. One of the crucial properties of the fullerene \( C_{60} \) is the energy states of \( T_{1u}, T_{2g}, T_{1u}, \) and \( T_{2g} \), for symmetry elements \( C_5, C_5^2, S_{10}, \) and \( S_{10} \), are consistent with the golden mean (FIG. 24). (Koruga, et al., 1993, Dreselhaus, et al., 1996). Since, the symmetry properties of the structure is determined of its vibration and rotation energy states, it has been shown that integral energy (translational, vibrational, rotational and electronic) states of fullerene \( C_{60} \) follows the golden mean rule or ratio (Harter, 1989).

FIG. 2 shows a figurual representation 21 of the golden mean rule or golden ratio. The golden ratio usually designated with the symbol \( \Phi \) and expresses the relationship that the sum of two quantities is to the larger quantity as the larger quantity is to the smaller quantity, that is \( a+b \) is to \( a \) as \( a \) is to \( b \). The golden ratio can be expressed mathematically as:

\[ \Phi = +1/2 \phi = \pm 0.618 \]

The conjugate golden ratio \( \phi = \pm 0.618 \) corresponds to the length ratio taken in reverse order \( b/a \).

In a preferred form of the invention, FIG. 1b shows fullerenes modified 20 with multiple hydroxyl groups (OH), 26, multiple hydrogen atoms (H), and/or molecules with one or more molecules with hydroxyl groups \( \phi \) to form substances \( C_{60}(OH) \), \( H2N \), \( H2O \) (where \( x \) is from 10 to 36, and \( y \) from 0 to 24 and \( x+y \) from 0 to 12). These compounds will be referred to herein as Modified Fullerenes 20. Modified Fullerenes are soluble in water and interact with water via hydrogen bonds. Modified Fullerenes are susceptible to degradation from environmental and chemical attacks. Such exposure to environmental and chemical agents can lead to a removal of functional groups from the Modified Fullerene. This is undesirable as unmodified or “naked” fullerenes \( C_{60} \) have been found to be cytotoxic.

Experiments with \( C_{60}(OH)3 \) 20 (FIG. 1b) in two different human cells lines show that the cytotoxicity is a sensitive function of surface derivatization (Sayes, 2004). Experiments strongly suggest that the mechanism of cell death is oxygen radical induced peroxidation of the lipid bilayers of cells by “naked” nano-\( C_{60} \). In experiment with human dermal fibroblasts, human liver carcinoma cells (HepG2), and neuronal human astrocytes at doses higher than 50 \( \mu \)g (LC50 = 2–50 \( \mu \)g, depending on cell type) cytotoxicity arise after 48 h of exposure (Sayes, 2004). However, in the same experiments it was shown that Modified Fullerenes 20 show no cytotoxicity. Thus, it is an important aspect of the present invention to provide a stable Modified Fullerene.

Toxicity test for harmonized, Modified Fullerenes has shown this substance is not cytotoxic when the material is subjected to a Salmonella typhimurium reverse mutation assay (AMES test). The Ames test is used to determine any potential mutagenic activity of the test HMF material. The HMF material was exposed to a large number of test organisms in an agar plate. The agar plates were monitored for growth of revertants (organisms mutating to the wild type). The number of wild type organisms are counted to estimate the mutagenic potential of the HMF material. The tests results showed the HMF material was not mutagenic.

It has been found by the present inventor, the Modified Fullerenes can be stabilized in a harmonization process. Modified Fullerenes, are made by a procedure described in U.S. Pat. No. 5,648,523 which is incorporated herein by reference in its entirety by reference and made a part hereof. More particularly, Modified Fullerenes can be prepared by one of the following six methods. First, Modified Fullerenes can be prepared from hydrolysis of the reaction products of fullerenes, either pure \( C_{60} \) or a mixture of \( C_{60} \) (84%) and \( C_{70} \) (16%), with nitromon tetrafluoroborate in the presence of organocarboxylic acid (RCO2H) at ambient temperature. Sayes, et al., U.S. Pat. Nos. 5,177,248; et al. 5,294,732; and et al., J. Am. Chem. Soc. 1992, 114, 10154; and Chang, et al., J. Am. Chem. Soc. 1993, 115, 5453. The structure of the resultant Modified Fullerene has been characterized to consist of \( C_{60} \) (OH) (FIG. 4), with \( x<5 \) and \( y=15 \) on average.

Second, a Modified Fullerene can be synthesized via hydrolysis of the reaction products of fullerenes, either pure \( C_{60} \) or a mixture of \( C_{60} \) (85%) and \( C_{70} \) (16%), with a solution of sulfur trioxide (30%) in sulfuric acid. See Chang, et al., J. Org. Chem. 1994, 59, 3960. The structure of the resultant Modified Fullerene has been characterized to consist of \( C_{60} \) (OH) with \( y=12 \) on average.

Third, a Modified Fullerene can be prepared by the reaction of fullerenes with either a mixture of conc. \( H2SO4 \) conc. \( HNO3 \) and water at 90°C or a mixture of oleum (\( H2SO4 // SO3 \)), KNO3 and water. See Chang, et al., U.S. Pat. Nos. 5,177,248; 5,294,732; J. Chem. Soc., Chem. Commun. 1992, 1791; Chang, et al., Mat. Res. Soc. Symp. Proc. 1992, 247. The structure of the resultant Modified Fullerene has been characterized to consist of \( C_{60} \) (OH) (FIG. 4), with \( x<5 \) and \( y=15 \) on average.

Fourth, a Modified Fullerene can be synthesized by the reaction of fullerenes, dissolved in either benzene or toluene, with aqueous sodium hydroxide in the presence of a catalytic amount of tetrahydroammonium hydroxide and oxygen (in air). See Li, et al., J. Chem. Soc., Chem. Commun. 1993, 1784. The structure of the resultant Modified Fullerene has been characterized to consist of polyhydroxylated \( C_{60} \) fullerene derivatives with 26 hydroxyl groups per \( C_{60} \), cation on average.

Fifth, a Modified Fullerene can be prepared by the reaction of fullerenes, dissolved in either benzene or toluene, and gaseous nitrogen dioxide, followed by hydrolysis of resulting products with aqueous NaOH. See Chang, et al., Tetrahedron, “Efficient One-Flask Synthesis of Water-soluble Fullerenols.” Gaseous nitrogen dioxide can be generated by either reacting \( NaNO3 \) with FeSO4 in aqueous \( H2SO4 \) in the presence of air (Roy, et al., J. Chem. Soc., Chem. Commun. 1994, 275) or reacting \( NaNO3 \) with conc. \( HNO3 \). The former method yields nitrofullerenols consisting of 6-8 nitro and 7-12 hydroxyl groups per \( C_{60} \). Hydrolysis of these products results in Modified Fullerenes with 13-20 hydroxyl groups per \( C_{60} \). The later method gives water-soluble Modified Fullerenes with a maximum number of hydroxyl groups per \( C_{60} \) as 20 as identified by the FAB mass spectroscopy.

Sixth, a Modified Fullerene can be synthesized by the reaction of fullerenes with an excess of \( H2SO4 // tetrahydrofuran \) (THF) complex followed by hydrolysis with either sodium hydroxide/hydrogen peroxide or sodium hydroxide. See Schneider, et al., J. Chem. Soc., Chem. Commun. 1994, 463.

Harmonizing the Modified Fullerene

To stabilize the Modified Fullerenes to withstand chemical and environmental attacks to avoid stripping of their functional groups, the Modified Fullerenes are subjected to a harmonization procedure. The harmonization procedure promotes the electron energy levels of the molecular orbitals of the \( O-H \) covalent bonds from a ground state (FIG. 5a) up one energy level to a harmonized state (FIG. 5c) where the
valence electrons 50 are at a greater distance away from the nucleus than when in the ground state. This creates larger distances between bonding sites on the spherical surface of the Modified Fullerene of hydrogen electrons of x and y groups, forming a dynamical, non-localized cloud "Φ cloud" 84 (FIGS. 6a and 9) of electrons capable of forming a hydrogen bonding network. In one preferred form of the invention, energy state of the Φ cloud assumes the shape of a "sunflower" pattern 52.

[0071] FIGS. 6a-c shows the electron cloud of a hydrogen atom in three different states. FIG. 6a shows the electron cloud in a ground, unexcited, state. FIG. 6b shows the same electron cloud when exposed to random radiation showing the electrons in an excited state resulting with a substantial portion of the electrons in positions farther from the nucleus when compared to the electrons in the ground state. FIG. 6c shows the electron cloud of hydrogen atoms exposed to harmonized excitation energy (Eθ) as opposed to random radiation. The sunflower shaped Φ cloud 84 allows for hydrogen atoms to bond to hydrogen atom wherein the hydrogen bond the length of the O—H covalent bond and the length of the O—H—H hydrogen bond length obey the golden ratio shown in FIG. 2 and described above.

[0072] Prior to 1999, the standard teaching stated that hydrogen bonds existed between water molecules because of the electrical attractions between a positively charged hydrogen atom and a negatively charged hydrogen atom in a neighboring molecule. These electrostatic interactions can be explained perfectly by classical physics—Coulomb's law, by which it is possible to describe the attraction and repulsion between charged particles separated from each other by a distance. Experiments carried out in 1999 clearly showed that electrons, like all other objects in nature, naturally seek their lowest energy state, through minimization of their total energy (including their energy of motion). Lowering an electron's kinetic energy means reducing its velocity and momentum. According to the Heisenberg Uncertainty Principle, by reducing the momentum of electrons the electrons must spread out in space thereby delocalizing the electrons into a semi-π electron cloud 84 (Φ cloud). In other words, the electrons in the hydrogen bond are quantum mechanically shared with more than one bonding site. Issues' experiment provides unambiguous evidence of the possible existence of multi-bonding hydrogen electrons in hydrogen bonds. Recent studies of hydrogen bonding in water, using very fast multidimensional nonlinear infrared spectroscopy, shows that hydrogen-bonded network of liquid water has an energy redistribution on a femtosecond timescale (Cowan, 2005). Those experiments prove that multi-bonding hydrogen electrons exist and play an important role in hydrogen bond network of matter.

[0073] The hydrogen atom is the simplest case of positive/ negative charge organization in a spherical shape because it has a nucleus of one proton and one electron orbiting the nucleus. The electron has a certain total energy; the essence of quantum theory is that electrons remain in stable states of specific energies, and for each state there is a particular orbit. When an electron is in the lowest energy level, called the ground state, its radius is 52.9 pm. The electron must gain energy to move out to larger orbits. The orbits, and so the energy levels, follow strict spacing rules determined by quantum physics. Energy can be added to the atom either by collision with another particle or by absorption of a photon with sufficient energy. When the electron jumps up one or more energy levels the hydrogen is said to be in an excited state with an orbital radius of 236.8 pm for level two and 473.0 pm for level three (Lyman series). In normal conditions, electrons remain in an excited state for a very short period of time and drop to a lower level in about 10^-8 seconds (Balmar series), emitting a photon with energy equal to the difference in the energy of the excited level to the level to which it drops. A hydrogen atom is in state one (ground state) as a gas H2, or in an inorganic compound. However, hydrogen atoms in biomolecules and biological water are mostly in state two. Hydrogen ions in water have a quasi-proton existence because the proton never exists in aqueous solution as a free ion; it is always hydrated by being associated with neighboring water molecules. A proton in aqueous solution is very mobile, hopping from one water molecule to another with a period of about 10^-13 second.

[0074] The potential importance of hydrogen bonding in the structure and function of biomolecules was predicted by Pauling and Corey (1951), Watson and Crick (1953) and numerous other scientists. Hydrogen bond energies can vary in strength depending on numerous factors and can have values of 15-40 kcal/mol, 4-15 kcal/mol and 1-4 kcal/mol for strong bonds, moderate bonds and weak bonds, respectively. Intramolecular hydrogen bonds have force constant from 60 N/m to 120 N/m. In a preferred form of the present invention, hydrogen bonds will be of moderate strength with a force constant of about 80 N/m and energies 4-15 kcal/mol. Such moderate hydrogen bond strengths correspond to a hydrogen bonding structure having a distance from a center of a donor atom to a center of an acceptor atom of about 280±10 pm.

[0075] It is well known that hydrogen-bonding 32 exists in functional groups 33 in protein side chains 34 (See FIG. 3a, healthy hydrogen bonding) such as in: Lysine-histidine or tryptophan, arginine-glutamic acid or asparagine acid, tryptophan or praline, or histidine-tyrosine or threonine or serine in a donor-acceptor interaction. In protein and nucleic acid structures the distance from the center of a donor atom to the center of an acceptor atom is 290±10 pm and 310±20 pm, respectively. However, this intramolecular hydrogen bonding in functional groups of proteins is dynamic in nature with neighboring water molecules “competing” to take a donor or acceptor position normally occupied by an atom in the protein. In some cases, under the influence of external or internal factors, a water molecule 37 may occupy the position of a natural, intramolecular, hydrogen bond 38 in proteins (FIG. 3a, unhealthy hydrogen bonding) changing the conformation of the protein and its functional characteristics.

[0076] We have identified a direct correlation between the energy levels of the unhealthy hydrogen bonding to the structural intramolecular integrity of biomolecules (e.g., protein, DNA, among others). We further identified that a bio-molecule (e.g., protein, DNA, among others) is “healthy” (FIG. 3a) (i.e., having normal and natural functionality with constituent molecules at the intrinsic global energy level possible for that biomolecule) when water molecules interact and are connected to the biomolecules via weak bonds. In this healthy state the biomolecule operates at its optimal and most efficient state, maximizing proper functional interaction with other biomolecules (e.g., between different pre-collagen biomolecules which gives collagen fibers its structure) and efficient interaction with the molecular system as a whole. We have also observed that biomolecules, that are healthy, have a different structural confirmation state from that observed in “unhealthy” biomolecules (FIG. 3b). Additionally, we dis-
covered that through external influence, a non-healthy biomolecule can adopt the structural confirmation of that observed in a healthy biomolecule (FIG. 4). This structural confirmation state change, in-turn, helps attract and develop non-covalent bonds with adjacent water molecule(s) and adjacent hydroxyl group(s) (OH), helping the previously “unhealthy” biomolecule to return to good health. This confirmation change for unhealthy biomolecules can be achieved by exposing the unhealthy biomolecule to an externally induced excitation frequency with a wave number between 500 to 3800 cm⁻¹.

[0077] One suitable source of the externally induced excitation energy having a wave number between 500 to 3800 cm⁻¹ can be provided by exposure of the unhealthy biomolecule to a harmonized Modified Fullerene 20 as shown in FIGS. 4 and 9. The harmonized Modified Fullerene 20 influences and enables the unhealthy fullerene to attract and develop a non-covalent bond with adjacent water molecule(s) and adjacent hydroxyl group(s) (OH). This leads to the biomolecule “self-repairing” itself and returning to good “health” leading to beneficial health outcomes. The energy state (T1g, T2g, T1u and T2u) of the harmonized Modified Fullerene product provides the necessary excitation frequency with a wave number from 500 to 3800 cm⁻¹.

[0078] The harmonization procedure requires forming a solution of the Modified Fullerenes and exposing the solution to polarized light, heating and a pulsing magnetic field. More particularly, solutions of Modified Fullerene are formed by dissolving the Modified Fullerene into an aqueous solution or other solubilizing agent. These solutions are optionally subjected to ultrasonication for 10 to 30 minutes. The Modified Fullerene-containing solution is then treated by exposure for a period of 0.5 hours to 2 hours simultaneously to: (1) a pulsing polarized light where the power source pulses from 20 W to 500 W in accordance with the (Fibonacci series “Φ”), from a distance of 10 cm to 60 cm, and with a wave length of 320 nm to 4200 nm; (2) heating the solution while continuously stirring from 20°C to 80°C for ½ of the treatment time period followed by cooling the solution from 80°C to 15°C; for ½ of the treatment time period; and (3) subjecting the solution to an oscillatory (Fibonacci series “Φ”) magnetic field intensity from 0.4 T to 1.2 T. This procedure can be conducted in a “PHM system” (Photo-Heath-Magnet Devices) where solutions of volumes from 0.2-3 liters can be treated.

[0079] According to this procedure, the Θ cloud 84 of temporally delocalized electrons of the hydrogen bonds of the now harmonized Modified Fullerene move around the surface of the harmonized Modified Fullerene forming a magnetic shield 84 (FIG. 9) (nano-magneto sphere) having an intensity from 0.5 nT to 25 nT, the intensity oscillating in accordance with the golden mean law. If some molecules with positive or negative charges try to “attack” the harmonized Modified Fullerene they will slide behind the nano-magneto sphere, somewhat like how charged particles from outer space glide over the Earth’s magnetosphere. Because the entire surface of the harmonized Modified Fullerene is enveloped in a Θ cloud 84 means that when viewed from the outside the harmonized Modified Fullerene will appear as one body mass with equal mass distribution in space.

[0080] We characterized the starting Modified Fullerene and the harmonized Modified Fullerene [(C60(OH)(10-35)]Φ]Φ as follows: (1) starting substance C60(OH)10-35 with NMR (1H NMR Bruker AC 250 E, 250 MHz and 13C NMR 62.9 MHz), IR (Perkin Elmer 457, FTIR Bomem MB100 FT), UV/Vis Perkin-Elmer series λ, ESR (Bruker ESR-300), TG (DuPont 1090 TA, TGA 951) and remanent magnetism (JR-5, with accuracy ±3 pT), (2) after harmonization [C60(OH)(10-35)]ΦΦ with 13C NMR and JR-5, (3) collagen in vitro with IR and FTIR before and after the harmonization procedure, (4) group of 50 mice which were induced by carcinoma before and after influence [C60(OH)(10-35)]ΦΦ, (5) group of 60 people with different skin problems including wrinkle, rash, pigment, BCC, and skin cancer with documentation which include clinical pictures before and after treatment by [C60(OH)(10-35)]ΦΦ, and (6) six human skin biopsies with characterization state of epidermis, basal membrane, collagen and elastin before and after treatment by [C60(OH)(10-35)]ΦΦ.

[0081] NMR is an effective characterization technique to distinguish a harmonized form of (C60(OH)(10-35)]Φ of a non-harmonized form C60(OH)(10-35). A non-harmonized form of C60(OH)(10-35) will have a dominant peak from 72 ppm to 78 ppm representing the C60(OH)(10-36) functional body (FIG. 7). Smaller peaks flank the dominant peak from 65.0 ppm to 95.0 ppm indicating that each atom of the Θ cloud is not equally covered by OH groups. The peak at 92.5 ppm indicates the presence of a catalysts such as NaBr, NaOH and D2O. A small peak at 143.0 ppm indicates the presence of pure C60 (C—C bonds).

[0082] FIG. 7 is a 13C NMR spectra 100 for C60(OH)34. A dominant peak 102 is located at 77.5 ppm flanked on both downfield and upfield sides by numerous smaller peaks, collectively referred to as 104, from 65 ppm to about 90 ppm. The dominant peak 102 represents the chemical shift (δ) 77.5 ppm indicating a C60OH34 functional body. The numerous smaller peaks are from 65 ppm to about 90 ppm are representative of the C60OH functional group(s). Thus, it is clear that not all C60 are equally surrounded by OH groups.

[0083] FIG. 8 shows a 13C NMR spectra for a harmonized, hydrogen modified fullerene [C60(OH)34]ΦΦ 200 having a single dominant peak 202 at 170.2 ppm which indicates that each carbon atom of C60 is equally covered by OH groups (notwithstanding the number of carbon atoms is 60, while number of OH groups is 24). Harmonized hydrogen modified fullerene substance “appears” as a one body system. Peaks with smaller intensity on 77.5 ppm and 143.0 ppm indicate the presence of a small amount of non-harmonized hydrogen modified fullerene substance and pure C60 fullerene, respectively. Thus, the harmonized, hydrogen-modified fullerene shows all functional groups resonate at the same frequency, and, therefore appear as a body which has equal mass distribution in space.

[0084] The remanent magnetism of C60(OH)34 was measured before and after subjecting the C60(OH)34 to a harmonization procedure described above. The harmonized, hydrogen modified fullerene [C60(OH)34]ΦΦ showed an increased magnetic field strength of about 4 nT.

[0085] Hydrated Harmonized Modified Fullerenes

[0086] FIG. 9 shows a harmonized Modified Fullerene 20 surrounded by water molecules 37 (hydrated harmonized Modified Fullerene). Three levels of hydrogen bonding are shown. The first level of hydrogen bonding 60 is between a hydrogen atom 62 of an OH group 26 and an oxygen atom 64 of an adjacent OH group 26 with each of these OH groups 26 covalently bonded to a carbon atom of the harmonized Modified Fullerene 20.

[0087] A second level of hydrogen bonding 70 occurs between an oxygen atom 64 of an OH group 26 of the har-
monized Modified Fullerene 20 and a hydrogen atom 72 of a water molecule 37. The effects of the Ω cloud 84 of temporarily delocalized electrons of the harmonized Modified Fullerene acts as a template to cause the hydrogen bond lengths 70 between the harmonized Modified Fullerene 20 and the water molecules directly hydrogen bonding thereto, to obey the Fibonacci law. What is meant by this is that the ratio of the length of the covalent bond of the O—H bond (strong interaction) and the hydrogen bond length between an oxygen and hydrogen atom is about 1.61803. The intermolecular formula for this hydrated form of the harmonized Modified Fullerene will be designated as \([C_{60}(OH)_{24}]^{[n+\cdot \cdot \cdot +n]}(H_2O)\).

A third level of hydrogen bonding 80 occurs between hydrogen atoms 72 of water molecules 37 and oxygen atoms 82 of adjacent water molecules 72. The intermolecular formula for this two-layered hydrated structure will be designated as \([C_{60}(OH)_{24}]^{[n+\cdot \cdot \cdot +n]}(H_2O)\) m (H₂O).

The first level of hydrogen bonds is the strongest of the three and is 1.8 times stronger than the second level hydrogen bonds 70. The second level of hydrogen bonds 70 is the second strongest of the three levels and has a strength of 1.5 times that of level three hydrogen bonds 80. The hydrogen bonds of levels one and two provide the electron cloud 84 and produce an oscillatory magnetic field of 0.5 nT and causes water molecule surrounding the harmonized Modified Fullerene 20 to generate a magnetic field up to 4 nT.

A third hydrated form of the harmonized Modified Fullerene will include ions and will have the intermolecular formula of \([C_{60}(OH)_{24}]^{[n+\cdot \cdot \cdot +n]}(H_2O)\) m (H₂O). The ions can be present in an amount by weight of from about 0.01% to about 15%.

### Example 1 of a Topical Cream

The Phase A ingredients set forth in the table below were added to a tank in the order set forth in the table with mixing until the batch was uniform and smooth. The Phase B ingredient of a harmonized Modified Fullerene \([C_{60}(OH)_{24}]^{[n+\cdot \cdot \cdot +n]}(H_2O)\) was added to Phase A at 300 rpm until the mixture was uniform and smooth.

<table>
<thead>
<tr>
<th>PHASE</th>
<th>INGREDIENT</th>
<th>TRADE NAME</th>
<th>SUPPLIER</th>
<th>FUNCTION</th>
<th>WT. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Water</td>
<td>DI water</td>
<td></td>
<td>solvent/carrier/emulsifier/viscosity modifier</td>
<td>1-2</td>
</tr>
<tr>
<td>A</td>
<td>polyacrylate-13, polyanisobutene, polyisobutene</td>
<td>Sepiplus 400</td>
<td>Seppic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Cyclopentasiloxane</td>
<td>Dow Corning</td>
<td>Dow Corning</td>
<td>emollient</td>
<td>5-35</td>
</tr>
<tr>
<td>B</td>
<td>NA</td>
<td>NHS-Best</td>
<td>NA</td>
<td>active</td>
<td>10-20</td>
</tr>
</tbody>
</table>

### Example 2 Topical Cream

The ingredients set forth in the Table below were added together in the following order. Phase A ingredients were added to a first vessel and blended until uniform and lump free. Phase B ingredients were added to a second vessel and pasted. Add Phase C ingredients to a third vessel and add Phase B ingredients with high shear mixing. Add Phase D ingredients to Phases B/C and mix until all ingredients are dissolved. Slowly add Phase E ingredient \([C_{60}(OH)_{24}]^{[n+\cdot \cdot \cdot +n]}(H_2O)\) (NHS-Best) to Phase B/C/D and mix at or below 300 rpm until uniform. Slowly add and blend Phases B/C/D/E ingredients to Phase A in small increments and mix at or below 300 rpm. Continue mixing until the batch is uniform and smooth.
Example 3 Topical Cream

The ingredients set forth in the Table below were added together in the following order. Phase A ingredients were added to a first vessel and blended until uniform and lump free. Phase B ingredients were added to a second vessel and mixed at 300 rpm or less until all solids dissolve. Add Phase B ingredients to Phase A while mixing at 300 rpm or slower until uniform.

<table>
<thead>
<tr>
<th>PHASE</th>
<th>INGREDIENT</th>
<th>TRADE NAME</th>
<th>SUPPLIER</th>
<th>FUNCTION</th>
<th>WT. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>dimethicone; dimethicone/PEG-10/15 crosspolymer</td>
<td>KSG-210</td>
<td>Shin Etsu</td>
<td>emulsifier</td>
<td>1-10</td>
</tr>
<tr>
<td>A</td>
<td>Bis-PEG/PPG-10/1 dimethicone</td>
<td>Goldschmidt</td>
<td>emulsifier</td>
<td>1-5</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>dimethicone</td>
<td>Dow Corning</td>
<td>200 (100 ce)</td>
<td>Dow Corning</td>
<td>5-20</td>
</tr>
<tr>
<td>A</td>
<td>dimethicone</td>
<td>Dow Corning</td>
<td>200 (350 ce)</td>
<td>Dow Corning</td>
<td>5-20</td>
</tr>
<tr>
<td>B</td>
<td>pentylene glycol</td>
<td>HydroSol-5</td>
<td>Symise</td>
<td>feel modifier</td>
<td>3-10</td>
</tr>
<tr>
<td>B</td>
<td>chondrus crispus (carrageenan) water</td>
<td>Viscarin PC 389</td>
<td>FMC</td>
<td>stabilizer</td>
<td>0.1-1</td>
</tr>
<tr>
<td>C</td>
<td>sodium chloride</td>
<td>DI water</td>
<td>Morton</td>
<td>solvent/carrier</td>
<td>0-70</td>
</tr>
<tr>
<td>D</td>
<td>sodium chloride</td>
<td>Sodium chloride</td>
<td>Morton</td>
<td>polarity modifier</td>
<td>0.2-2</td>
</tr>
<tr>
<td>E</td>
<td>NHS-Best</td>
<td>NHS-Best</td>
<td></td>
<td>active</td>
<td>10-20</td>
</tr>
</tbody>
</table>

A Mother Tincture for Homeopathy Pharmaceuticals

Five published clinical outcome studies in homeopathy focus on diverse medical conditions: headache, acute otitis media, attention-deficit hyperactivity disorder (ADHD) in children, respiratory tract and ear complaints, including allergies, and male infertility (Muccarelli-Tomaioi, 2001, Frei, 2001a, Frei, 2001b, Riley, 2001, Gerhard, 2002) conclude in favor of the clinical effectiveness of homeopathy. The World Health Organization (WHO) is favorably disposed to homeopathy in spite of the resistance of medical doctors. However, in basic research, there are some contradictory results, but a recent experimental results about quantum property of hydrogen bonding indicates that the right homeopathy pharmaceuticals may have beneficial effects. Our invention is a mother of tincture product including HMF in a suitable carrier an in an amount by weight of from 0.6 mg/cm³ to 14 mg/cm³.

NHS Stabilized Vitamin C

The harmonized form of [C₆₀(OH)₂₋₉]⁺⁻ has been shown to be an effective stabilizing agent or preservative for increasing the shelf life of Vitamin C in an aqueous solution. It is contemplated that the shelf life of other environmentally delicate compounds could be increased with the use of the harmonized form of [C₆₀(OH)₂₋₉]⁺⁻ either as a component in a solution or as an additive to a dry or semi-liquid dosage form. Environmentally delicate compounds can include those compounds that have a therapeutic of cosmetic effect. The compounds are typically in a composition suitable for delivery in vivo by an administrative route such as parenteral, oral, ophthalmic, topical, buccal, transdermal or the like.

Shelf-life studies were conducted on six aqueous solutions containing Vitamin C (L-ascorbic acid). The samples contain the contents as set forth in the Table below.
Each of the samples were tested to determine the percentage of active Vitamin C remained in the sample after 28 days, 30 days and after being subjected to a heat treatment designed to simulate the sample had been stored for 120 days. Vitamin C activities were measured by: (1) HPLC (High-performance liquid chromatography) method using peak difference on 254 nm (retention time was 10.5 min, absorption maxima was on 244.5 nm based on Waters 996 photodiode array detector), and (2) time-dependent UV-vis absorption based on AA (L-ascorbic acid)—DHA (dehydroascorbic acid). Initial AA peak (active vitC) was on 264 nm, while DHA peak (non-active vitC) was on 253 nm. Peak decreasing on 264 nm indicates the oxidation (AA when AA is oxidized to DHA the band shifted to lower wavelength at 253 nm).

Sample 1 results show that an 8.3% by weight solution of Vitamin C had only 0.12% active Vitamin C remaining after 28 days. Sample 2 results show that a 7.5% solution of Vitamin C had 18.2% weight of active Vitamin C remaining after 28 days. However, Sample 3 results show that when the harmonized form of [C_{n}(OH)_{3}]^{+} with 7.5% Vitamin C, 75.4% of the Vitamin C remained active after 28 days. Sample 4 results show that a 3.1% by weight solution of Vitamin C with the harmonized form of [C_{n}(OH)_{3}]^{+} 84.8% of the Vitamin C remained active after 28 days. When EDTA was added to a 3.1% by weight solution of Vitamin C along with the harmonized form of [C_{n}(OH)_{3}]^{+}, Sample 5 results shows that 95.4% of Vitamin C remained after 28 days. Finally, Sample 6 results showed that adding EDTA alone, without adding the harmonized form of [C_{n}(OH)_{3}]^{+}, to a 3.1% by weight Vitamin C solution had 2.3% active Vitamin C after 28 days. Accordingly, the harmonized form of [C_{n}(OH)_{3}]^{+} is an effective preservative for Vitamin C in an aqueous solution.

Each of the samples was also tested by UV-vis spectrophotometer at the beginning (blind probe) and after 30 days to determine the capacity for the sample to scavenge radicals (Radical Scavenger Capacity). This test was conducted using 1,1-diphenyl-2-picrylhydrazyl (DPPH). Samples were made in 18 different concentrations (from 2.5 µL to 200 µL substance in 10 mL 95% ethanol). For each sample a blind probe was done. The activity of samples was identified by the absorbance change occurring at 517 nm. RSC (Radical Scavenger Capacity) is equal to IC_{50}, which represent concentration of antioxidants when 50% of DPPH^* radicals are scavenged (IC_{50}=50% RSC).

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Contents</th>
<th>Components in sample</th>
<th>After 28 days</th>
<th>After 30 days</th>
<th>Heat treatment Equivalence to 120 days</th>
<th>Normalized Radical Scavenger Capacity (RSC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.3% VitC in water</td>
<td>1.66 mg - vitC 18.34 mg - water</td>
<td>0.12% 0.10% &lt;0.01%</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>7.5% VitC in C_{n}(OH)_{3} (not harmonized)</td>
<td>1.50 mg - vitC 18.50 mg - C_{n}(OH)_{3}</td>
<td>18.2% 18.1% 2.2%</td>
<td>39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>7.5% VitC in [C_{n}(OH)_{3}]^{+}</td>
<td>1.50 mg - vitC 18.50 mg - [C_{n}(OH)_{3}]^{+}</td>
<td>75.4% 75.3% 71.2%</td>
<td>43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>3.1% VitC in [C_{n}(OH)_{3}]^{+}</td>
<td>0.62 mg - vitC 19.38 mg - [C_{n}(OH)_{3}]^{+}</td>
<td>84.8% 84.7% 82%</td>
<td>81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3.1% VitC in [C_{n}(OH)_{3}]^{+} EDTA</td>
<td>0.62 mg - vitC 16.50 mg - [C_{n}(OH)_{3}]^{+} EDTA</td>
<td>95.4% 95.5% 95.2%</td>
<td>82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>3.1% VitC in EDTA</td>
<td>0.31 mg - vitC 9.69 mg - EDTA</td>
<td>2.3% 2.2% 0.05%</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on these results for Vitamin C it is contemplated that other environmentally delicate substances could be stabilized by adding an effective amount of a harmonized form of [C_{n}(OH)_{3}]^{+}. Other therapeutic substances include vitamins, hormones, peptides, polypeptides, pharmaceutically active compounds, proteins, minerals, electrolytes and others.

Example Anti-Inflammatory Topical Cream

The ingredients set forth in the Table below were added together in the following order. Phase A ingredient, water, was added to a first vessel. Phase B ingredients were added to a second vessel and pasted. Add Phase C ingredients to Phase B ingredients with mixing and heat to 70° to 75°. Add Phase D ingredients to Phases B/C, heat to 70° to 75°, and mix until all solids melt. Add Phase B/C/D ingredients to the water and mix until uniform and cool to 35°. Add Phase E ingredient [C_{n}(OH)_{3}]^{+} (NHS-Best) to Phase A/B/C/D and mix at or below 300 rpm until uniform.
Human physiology and functionality depends on the volume, quality and state of water. The volume of water in the human body is from 65% to 85% by weight of the human body. Of this percentage, 62% is bound water associated with biomolecules, while 38% is “free” water. We have found that water should fit biomolecules in terms of structural and energetic states. This means that the criteria for optimal water properties is dictated by the structure and functionality and needs of biomolecules (DNA, RNA, proteins, membrane and etc.), cell and tissue. Water interacts with biomolecules primarily through hydrogen bonding. As set forth above, biomolecules typically have numerous intramolecular hydrogen bonds. For example each nucleotide of DNA has two (A=T) or three (C=O) hydrogen bonds. A hydrogen bond network of water in cells may be used to influence DNA hydrogen bonds through resonance. This means that the energy state of water may have a positive and/or a negative influence on biomolecules. From a structural point, one or more water molecules can be associated with a biomolecule depending on the size of the biomolecule. The organization of these associated water molecules into small or medium-sized clusters is preferred. Hydrogen bonding between water molecules has two principal components. The first component is electrostatic in nature and results from the electrical attractions between a positively charged hydrogen atom and a negatively charged oxygen atom in a neighboring molecule. These electrostatic interactions can be quantified by classical physics—Coulomb’s law, by which it is possible to describe the attraction and repulsion between charged particles separated from each other by a distance. The second component is quantum in nature and results from electron delocalization that allows for a sharing of electrons between the hydrogen bond and the stronger covalent bonds in the water molecule (Isaacs, 1999). This means that hydrogen bonds have their double identity: classical (Coulomb law—\( q_1 q_2 \)) and quantum (wave function—\( q_1 q_2 \)).

Professor Isaacs’ experiment clearly demonstrated that electrons naturally seek their lowest energy state, through minimization of their total energy, which includes their energy of motion-kinetic energy. Lowering an electron kinetic energy means reducing its velocity and its momentum, which leads, according to the Heisenberg Uncertainty Principle, to electrons spreading out in space. This electron “delocalization” means the electron in the hydrogen bonds may be shared by more than one bonding site.

FIG. 5 shows a five-water-molecule spherical cluster 25 where there may exist multiple hydrogen bonding sites. Analyzing the data from Professor Isaacs’ experiment using Fourier transform analysis provides information about the distances between bonding sites. The results of the experiments and Fourier transform analysis indicates a few distances of hydrogen bonding sites that are dominant \( d_\text{mm} = 0.193 \) nm, \( d_\text{ac} = 0.296 \) nm, \( d_\text{cc} = 0.426 \) nm and \( d_\text{nn} = 0.5 \) nm. Since an electron of a hydrogen atom bonded to an oxygen atom in a hydroxyl group (OH) is involved in a covalent (sigma) bond that means that the hydrogen electron is in semi-excited state. Spherical water cluster may have numerous hydrogen bonding sites located at different distances from the ground state. An electron cloud is moving as a “9 electron” on a spherical surface of the cluster 25 producing a magnetic field, which depends on the ratio of covalent electrons of two neighboring atom of hydrogen and oxygen, and hydrogen bonds network existence.

This means that a comparison of the electrical and magnetic interaction between two electron charges in neighboring atoms in relative motion in a water cluster may give an answer to the question: what intensity of the magnetic field we should expect? We know that it is not easy to calculate the magnetic interaction between two charged particles in motion relative to an observer \( O_x \) in a form similar to the electric interaction given by Coulomb’s law. However, we may compare the order of magnitude of the magnetic interaction with the electrical interaction. Considering two charges \( q_1 \) and \( q_2 \) of neighboring atoms (O and H) moving with velocities \( v_1 \) and \( v_2 \) relative to observer we may simplify the formulas, because we want to determine by an order of magnitude of the magnetic interaction. Thus, we can say that the electrical force produced by \( q_1 \) on \( q_2 \) as measured by \( O_x \) is \( q_1 q_2 E \). The magnetic field produced by \( q_2 \), if we use equation \( B = \frac{\mu_0}{2\pi r} (v_2 \times E) \), is of order of magnitude of \( \frac{v_2 E}{c} \) and the magnetic force on \( q_2 \) is of the order of \( q_2 B = (v_2 v_1 E/c^2) q_1 E \). Since, \( q_1 E \) is the electrical force...
on q then the ratio of the magnetic force/electrical force \( \left( \frac{F_m}{F_e} \right) = \frac{v\mu_0}{c^2} \). If the velocities of the charges are small compared with the velocity of light \( c \), the magnetic force is negligible compared to the electrical force and in many cases can be ignored. The orbital velocity of valence electrons in atoms is about \( 10^6 \) m/s, which gives \( \frac{F_m}{F_e} = 10^{-4} \). This means that existence of quantum action could be \( 6.26 \times 10^{-10} \) s·e·\( \mu_0 \) Js per each multi-hydrogen bonding electron. In this action area, from an energy point of view, there simultaneously exists both classical and quantum phenomena, induced magnetic field (as a coupling classical/quantum phenomenon) and velocity of multi-sites electrons (“\( \Theta \) electron cloud”).

Recent experiments using very fast multi-dimensional nonlinear infrared spectroscopy provided data that indicated a hydrogen-bonded network of liquid water has memory (cluster state) of ~50 femtosecond timescale (Cowan, 2005). When water loses memory for 50 fs it means that the quantum mechanical frequency of hydrogen network is \( v = 5 \times 10^{11} \) s. This corresponds to an energy per hydrogen bond network in water of \( E_{\text{H}_2\text{O}} \approx 1 \text{eV} - 6.26 \times 10^{-14} \times 5 \times 10^{-10} \times 3.13 \times 10^{-21} J \). From another approach \( E_{\text{H}_2\text{O}} \) energy has to be equal to the kinetic energy of multi-site hydrogen electrons \( E_{\Theta} \approx \frac{1}{2} m v^2 \), where \( m \) is electron mass, \( v \) average velocity of electron cloud as “delocalized” entity. The water cluster surface is covered by \( \Theta \) electrons cloud which moves with a velocity \( v \approx 0.8 \times 10^{-8} \text{m/s} \). Since Professor Cowan’s experiment was done in a nanofluidic cell size of about 800 nm with a water layer of about 500 nm, we may expect the existence of very small clusters number with 20, 30, 50 and 100 delocalized (multi-sites). The electron cloud’s velocity for such a cluster relative to the number of multi-sites is about 1.82, 1.49, 1.15 and 0.82 nm/s, respectively.

This gives that existence of pulsing hydrogen bond network of 50 fs, will generate magnetic field of “\( \Theta \) cloud” from 3.5 to 61.2 s lifetime (\( \Theta \)-oscillation).

The force of a magnetic field of delocalized electrons (\( \Theta \) cloud) should be equal to the product of the mass of an electron and its radial acceleration (\( e v_{\text{B}} \text{m} \)). For a water cluster R ~ 9.5 nm (H2O)n (H2O)n=hydrogen ion overlapping with 20 water molecules as a decahedron structure) and \( v_{\text{B}} = 1.29 \times 10^{-9} \text{m/s} \) magnetic field will be \( B \approx 0.587 \) nT. However, some of these clusters spontaneously will be organized in bigger cluster of 13 of them and we may expect a magnetic field from 0.587 nT to 7.63 nT. To compare with the Earth magnetic field of about 47,000 nT it is small, but if we compare with intensity of 0.003 nT of a human brain signals, it is large.

To test this approach we did experiments with tap water having high ion concentration (FIGS. 11 and 13) and water with low ion concentration (FIGS. 12 and 14). FIGS. 11 and 12 show the results of the tests prior to harmonization and FIGS. 13 and 14 show the results of the tests after subjecting the water samples to a harmonization process. FIGS. 11 and 12 show the magnetic field of the water samples oscillate about a zero centerline while the harmonized water sample for the high ion concentration oscillates about 0.28 nT and for the low ion concentration water sample about 0.587 nT.

The water was protected from exposure to air and all measurements were performed at room temperature. To measure changes in the magnetic field intensity of the Earth magnetic field on a 1 ml sample of tap water with a known chemical composition we employed the two Proton magnetometers (GSM-10, Canada) based on the Overhauser effect. (National Geomagnetic Institute, Serbia). The magnetometers had been synchronized giving the same value intensity of measuring the external magnetic field at a time. However, we could not control the ion concentration in air, the velocity and density of the outside air so from time to time we observed small differences in the readings of the two magnetometers, which were spaced 50 m from one another, in the range of 0 nT to 0.2 nT. The first magnetometer was used to measure the referent magnetic field while the second one measured the magnetic field of water and the referent magnetic field. The increase in magnetization of the sample is achieved by adding free electrons to liquid and utilizing the coupling of these electrons to protons. The generation of a proton signal is generated by a short pulse (35 ms) in a direction perpendicularly to the measured field. The magnetometer resolution is 0.1 nT operating with a 100 mA working current. The maximum error of measurement under these conditions was about 0.4 nT (±0.30 nT from the measured value).

All measurements were done in the national laboratory (Geomagnetic Institute, Grocka, Serbia), under controlled conditions (light, temperature, and measurement of intensity and change of Earth magnetic field). Two hundred samples were measured for a period of 10 minutes each. The sensor position of GSM-10 and sample position were in accordance with a standard scheme of geomagnetic procedure measurement (Guide for Magnetic Measurements and Observatory Practice, NOAA Space Environment Center, Boulder, USA). The experimental results show the existence of a magnetic field for a period of about 18 s with very dynamic changes in its intensity over the 18 s period of from 0 to 4 nT. Since water was under the influence of the external magnetic field (Earth magnetic field is about 47,000 nT) means that the intensity of the magnetic effect of water changes over time. According to statistics of clusters composition/decomposition, paramagnetic (increasing) and diamagnetic (decreasing) magnetic field in which a substance is present changes in the magnetic field can be detected as shown in FIGS. 11-14. The force of a magnetic field of delocalized electrons (classical quantum channel—locally extended, \( \Theta \) cloud) should be equal to the product of the mass of an electron and its radial acceleration (\( ev_{\text{B}} \text{m} \)). Spontaneously and chaotically, under the presence of ions, water will itself organize into clusters (paramagnetic rise until “plus” ~4-10 nT, peaks up), which quickly dissipates into a diamagnetic state until “minus” ~2-6 nT or oscillates numerous times from 0 to “plus” ~0.5 nT (FIGS. 13 and 14, with higher and lower value of ions in water, respectively).

However, when the same water samples were subjected to a harmonization process described herein the harmonized water make water clusters having a radius of R ~ 0.5 nm, (20 water molecules in a decahedron structure) and \( v_{\text{B}} = 1.29 \times 10^{-9} \text{m/s} \). The magnetic field of the harmonized water having a high ion concentration and a low ion concentration oscillate about a center line 0.28 nT and 0.587 nT, respectively (FIGS. 13 and 14). However, from time to time some of these clusters spontaneously will be organized in bigger cluster of 13 of them and we may expect a magnetic field from 0.587 nT to 7.63 nT (peaks up). This system of 13 dodecahedral clusters will disappear into individual clusters and dia-
magnetism arise and go to “minus” 2-6 nT (peaks down), and again go to 0.28 nt or 0.587 nT forming water network of clusters and Fibonacci chains.

These experimental results have led us to form harmonized water in a similar fashion that we prepared the harmonized Modified Fullerene described above. The method of making harmonized water is based on the regulation of the ratio of hydrogen bonds of water molecule with intermolecular hydrogen bonds to form a multiple water molecule cluster forming a 9 cloud such as the one shown in FIG. 6c that obeys golden mean properties to define a harmonized water cluster. FIGS. 23a,b show when a harmonized water cluster is present in a biological tissue it functions as does the harmonized, Modified Fullerene 20 shown in FIG. 4 to repair unhealthy intermolecular hydrogen bonds shown in FIG. 3a to healthy hydrogen bonds shown in FIG. 3b.

FIGS. 15a,b,c show three orientations of three-water-molecule-clusters with the central water molecule 200 positioned in a shaded box 202. The water molecules in these clusters are designated with a “D” for donor and an “A” for acceptor. The water molecule 200 is designated as a donor if one of its hydrogen atoms 204 is hydrogen bonding with an oxygen atom 206 in an adjacent water molecule 208. The water molecule 200 is designated as an acceptor if its oxygen atom 206 is part of a hydrogen bond with an adjacent water molecule. In FIG. 15a, the central water molecule 200 is designated as DA as it is donating electrons from its hydrogen atom to a hydrogen bond 210 with an oxygen atom 206 of a first adjacent water molecule 212 and its oxygen atom 206 is accepting electrons from a hydrogen atom from a second adjacent water molecule 214. In FIG. 15b, the central water molecule 200 is designated as AA as it is accepting electrons from hydrogen atoms from two adjacent water molecules 212 and 214. In FIG. 15c, the central water molecule 200 is designated as DD as it is donating electrons from its hydrogen atoms to two adjacent water molecules 212 and 214.

FIGS. 16a,b,c show three orientations of four-water-molecule-clusters with the central water molecule 200 positioned in a shaded box 202. FIG. 16a shows the central water molecule designated as DAA as the central water molecule is donating electrons to a hydrogen bond with a first adjacent water molecule 212, an accepting electrons in hydrogen bonds with the second 214 and a third adjacent water molecule 216 as it is donating electrons in hydrogen bonds with the first and second adjacent water molecule 212, 214, and accepting electrons in a hydrogen bond with the third adjacent water molecule. FIG. is designated as DDA for reasons that should be clear from the above description.

FIGS. 17a,b,c show three orientations of five-water-molecule-clusters with the central water molecule 200 positioned in a shaded box 202 and the fourth adjacent water molecule is designated as 218. Thus, FIG. 17a shows the central molecule donating electrons in a hydrogen bond with the first adjacent molecule, accepting electrons in two separate hydrogen bonds with the second and third adjacent water molecules and donating electrons in a hydrogen bond with the fourth adjacent water molecule 218. FIG. 17b shows the central water molecule 200 in an AADD conformation and FIG. 17c shows the central water molecule 200 in a DADA conformation.

It has been determined by the present inventor that if water molecules around biomolecules are in chaotic state (individual, dimer or trimer randomly moving) than they may attack hydrogen bonds of biomolecules and change conformation state of biomolecules from a healthy conformation FIG. 3a to an unhealthy conformation 3b. However, if clusters and chains of water molecules around biomolecules are ordered in accordance with the Fibonacci law (golden ratio) (harmonized water cluster) than the harmonized water clusters will “recognize” the state of intramolecular hydrogen bonding within the biomolecule. If the biomolecule is in a “healthy” conformation than the harmonized water clusters will not disrupt the intramolecular hydrogen bonding in the biomolecule. However, if the biomolecule is “unhealthy” (broken hydrogen bonds or hydrogen bonds is in a different configuration than the healthy conformation) than the harmonized water clusters will repair the biomolecule returning it to its normal, healthy conformation.

The hydrogen bonding and covalent bonding of the central water molecule 200 in the four molecule water clusters (FIGS. 16a,b,c) has been found to be in the harmonized state. The hydrogen bonding and covalent bonding ratios of the central water molecule 200 in both the three-water-molecule cluster (FIGS. 15a,b,c) and the five-water-molecule cluster (FIGS. 17a,b,c) do not obey coding law and the Fibonacci law, and, therefore are not in an optimal state (compromising of harmonized and coding states) and exposure of such numbered clusters could cause adjacent biomolecules in a healthy conformation to an unhealthy conformation.

FIGS. 18a-e shows the assembly of a water molecule chain that obeys the Fibonacci law. FIG. 18a shows a single water molecule and a continued fraction representation 229 of the Fibonacci law (golden ratio). Each progressive FIG. from 18a to 18f adds a water molecule (212, 214, 216, 218, 220, 222) to the chain to form a chain having six water molecules and the continued fraction representation 229 of the golden ratio is shown to progress in the order of 1, 2, 3/2, 5/3, 8/5, and 13/8. FIG. 19 shows a chain of water molecules having one end 240 of a chain of water molecules (212-234) in a first, four-water-molecule-cluster in conformation (AADD) and an opposite end of the chain 250 in a second, four-water-molecule-cluster in conformation (ADDA) and eight water molecules between the center water molecules 216-234 of the terminal clusters. The continued fraction representation 229 of the golden ratio is shown for each water molecule in the chain. The continued fraction representation 229 of the golden mean is plotted along the x-axis 252 and the decimal solution 254 the golden ratio is plotted on the y-axis in FIG. 20 and shows that the ratios approach the value of 1.618.

FIG. 21 shows water molecule clusters 300 with each water molecule being either in DDA 302 or AAD 304 conformation. The clusters 300 form a regular polyhedron having 12 pentagonal faces with each vertex having 3 intersecting pentagons, and, therefore, the clusters have dodecahedral symmetry.

FIG. 22 shows numerous icosahedral water clusters 300 connected together by chains of water molecules 310, which obey the Fibonacci law as shown in FIGS. 18-20 (Fibonacci water molecule chains). In a preferred form of the invention, clusters being connected to other water clusters 300 with two Fibonacci water molecule chains 310 is desired as it establishes an effective quantum communication channel with one chain functions as a signal transmitter and the other functions as a signal feedback.

One example for the use of harmonized water is in the treatment of Alzheimer’s disease which destroys intrac-
cellular information hardware of the brain. Cytoskeleton is a “cell brain” structure which is composed of more than thirty different biomolecules. However, one of the major structures is a microtubule which obeys the golden mean ratio (Koruga, 1993). Healthy microtubules work well in interaction with water and other biomolecules including tau proteins. It was experimentally observed that in Alzheimer disease microtubules are disrupted, and the golden mean of information processing in cell is violated (Wolfe, 2002). Water with golden mean property may help to reverse this process and return the nonharmonized microtubules to their healthy, harmonized state.

Another example is cell multipolar mitosis which is caused by malignant tumor development. In each cell cycle, the centrosome (microtubules are a major part of the centrosome structure) is duplicated to give rise to two centrosomes (i.e., the mitotic spindle poles) that organize the microtubule array of the mitotic spindle and thereby make possible equal segregation of sister chromatids to each of two daughter cells at the time of cell division. For reasons yet unknown, cell division switches in direction from a polar to three polar or multipolar direction. The cause for this switch may be due to a violation of a biophysical harmony (energy and information) of cell and tissue in general, and between microtubules and water particularly. We strongly believe that one of three key points for cancer generation results from an adverse change in the microtubule-water interaction. Also, we assume that treatment of subjects by exposure to harmonized water may help in both cancer.

Device and Method for Making Harmonized Water

The system and devices for transforming water in its ordinary energy state to water in a harmonized state (where its hydrogen bonding interaction with other water molecules and biomolecules obey the golden ratio) includes the step of filtering tap water, agitating the filtered water, heating and cooling the agitated water and exposing the water under treatment to a polarized light source and an oscillating magnetic field. The step of filtering the tap water is by filtering the water through a filter media of activated carbon and HMF material in an amount by weight of from 60:40 to 97:3 respectively.

For water with high ion concentrations, the water can be treated by reverse osmosis. After reverse osmosis, it may be desirable to optionally add ions such as Ca²⁺, Mg²⁺, Na⁺, K⁺, Fe³⁺, Cl⁻, HCO₃⁻, NO₃⁻, SO₄²⁻ with concentration 2-6%, 1.7-2.90%, 0.8-1.9%, 0.02-0.9%, 0.006-0.018%, 2.85-5.22%, 7.93-1525%, 0.46-1.0%, 2.00-3.84%, g/l, respectively.

For water with low concentration of ions Ca²⁺, Mg²⁺, Na⁺, K⁺, Fe³⁺, Cl⁻, HCO₃⁻, NO₃⁻, SO₄²⁻ it may be also desirable to add these ions to bring the ions to a concentration of 2-6%, 1.7-2.90%, 0.8-1.9%, 0.02-0.9%, 0.006-0.018%, 2.85-5.22%, 7.93-1525%, 0.46-1.0%, 2.00-3.84%, g/l, respectively.

The step of agitating the solution can be carried out by stirring or ultrasonication using a standard sonication energy probe.

The step of heating and cooling of the filtered water includes heating the water from room temperature to 105° C. followed by cooling from 105° C. to 6° C.

The step of exposing the water to a polarized light source and an oscillating magnetic field can be carried out in a “PHM-system” (Photo-Heath-Magnet Devices) discussed above. The step of exposing the water to polarized light is carried out in a continuous process or in a batch process. In the batch process the water is stored in a tank with transparent walls and at least one polarized light source is utilized or numerous light sources arranged about the tank and preferably positioned symmetrically about the tank. The light sources are directed through the tank of water and at a wave length from about λ = 320 nm to about λ = 1200 nm. The light sources are operated at 50 W to 150 W.

For continuous processing of water flowing through a transparent tube, the light sources are arranged about the transparent tube and the water is provided under pressure through the tube at a rate of from 0.5 m/s to 6 m/s. The light is at a wavelength from the range of λ = 320 nm to about λ = 1200 nm and are operated from 80 W to 500 W.

Harmonized Fullerene Light Filter

FIGS. 25a,b,c show the electron cloud 30 of π-electrons of carbon atoms of a fullerene 10 in different states. FIG. 25a shows the electron cloud 30 of a fullerene 10 in a ground, unexcited, state. FIG. 27b shows a plurality of fullerenes forming a thin film 32 on a suitable translucent substrate such as glass or plastic with the electron cloud 30 of hydrogen atoms in an unexcited state. FIG. 27c shows the thin fullerene film 32 exposed to diffused light 34 striking a first surface 36 of the film and being converted to harmonized light 38 as shown upon exiting an opposed second surface 40 of the thin film.

What is meant by the term diffused light is light where the photons of varying wave lengths are randomly ordered (FIG. 26a). FIG. 26a represents light of varying through a lens 61 wavelengths with different sized and gray scale dots. A plurality of light colored dots 60 represent photons of light of one frequency and similarly different shades and different sized dots 62 and 64 represent photons of light of different frequencies from each other and from dot 60. The photons are randomly distributed over a surface of the lens 61, and, therefore, by definition represents diffused light.

FIG. 26b represents polarized light with photons of the same first frequency 70 frequency are aligned in a straight line across the lens 71 are in a single plane and a mirror image plane 70'. Light of different frequencies 72, 74, and 76 are of differing wavelengths each along a single plane, and mirror image plane designated with a prime (’), with each plane parallel to one another.

FIG. 26c shows a representation of harmonized light. The term harmonized light is meant to refer to light where photons of different wave lengths (energy) are ordered by the golden mean law. Photons of numerous different wave lengths each emanate from a central point 80 and rotate clockwise in the form of a golden spiral (e.g., 82, 84, etc.) (with mirror image spirals designated with a prime CD). Each wave-length will have three spirals circumferentially spaced by 120° because the golden ratio in two dimensions obeys the
equation \( \Phi^5 + \Phi^2 = 3 \). A golden spiral is one that gets wider or further from the center point by every quarter of a turn by a factor of \( \phi = 2/1, 3/2, 5/3, 8/5, 13/8, \text{etc.} \) Harmonized light would also include golden spirals that rotate counterclockwise in accordance with \( \phi \) but these spirals are not shown for the sake of clarity. Harmonized light can be said to be hypopolarized light as photons of equal wavelength are linearly polarized light (in plane) and are circularly polarized in circles in such a way that linear-circular ratio by wave lengths (energy) are both \( \phi \) and \( \Phi \).

[0143] Since 1990, the optical properties of molecules \( C_{60} \) in solution, thin film and crystal states has been investigated and well summarized in the literature (Dreselhauze, 1996).

However, until now no one investigator has paid serious attention to its optical golden mean properties. One of the clearest features in a regular, periodic optical crystal is the photonic band gap, which is similar to the electronic band gap in semiconductors. However, under influence of light, samples, which consists of multilayer dielectric structures of the golden mean (1D quasicrystal), also generate mode beating and pulse stretching with strongly suppressed group velocity for frequencies close to a Fibonacci band gap (Del Negro, 2003). Consideration of this phenomena based on transfer matrix theory suggest the existence of Fibonacci band-edge resonance. As discussed above in reference to Fig. 2, the ratio of successive terms in the Fibonacci sequence \( (0, 1, 1, 2, 3, 5, 8, 13, 21, 34, \ldots) \) tends to the golden ratios, which is \( \Phi = 1.61803 \) when the ratio is calculated from bigger to smaller values of sequence \( (34/21, 21/13, \ldots) \), or the inverse is \( \Phi = 0.61803 \) when the ratio is calculated from smaller to bigger value of sequences \( (21/34, 13/21, \ldots) \). One example in nature of the golden ratio include a golden triangle which is defined by the equation \( \Phi^2 + \Phi + 1 = 0 \), which provides a mathematical model of human brain functionality.

[0144] The brain memory span—the link between psychometric intelligence and cognition—could be understood as a superposition of \( h \) harmonics times \( 2\Phi \), where half of the fundamental is the golden mean as the point of resonance. The brain wave packets are ordered by the golden mean and may be very well understood as bifurcations which occur at the edge of chaos by relation \( 2\Phi^{3+\Phi} \) (Weiss, 2003).

[0145] We tested the resonance capability of the golden mean as an influence of Fibonacci type optical spectrum to the brain. In order to do that we employed a fullerene \( C_{60} \), as a Fibonacci type structures (3D quasi-crystals) and its effects on the biomolecule clathrin, which is present in the synapses in the human brain. We assume, if resonance exists between the clathrin molecule and the fullerene \( C_{60} \), then the optical transmission spectrum of \( C_{60} \) will have an influence on the clathrin functionality that is measurable using an EEG signal taken from a human being exposed to optical transmission.

[0146] To make a prototype of a nanophotonic glass we deposited fullerene \( C_{60} \) onto a planar surface of a sheet of transparent white floatglass (PGO, Germany) to form a thin film of the fullerene \( C_{60} \) on the glass (FIGS. 25b, c). The precursor powered \( C_{60} \) was acquired from Materials and Electrochemical Research (MER) Corporation, USA with purity of 99.95%. The glass had following characteristics: 1.1 mm thickness, refractive index 1.52 on 587.6 nm, coefficient of thermal expansion \( 8x10^{-6} \) through a temperature range of 0-300°C, a dielectric constant 7.75 on 25°C and 1 MHz, specific resistivity \( 9.7 \times (\Omega \text{cm}) \) and transparency of 92% in range of wavelength 380-2500 nm. To deposit the thin film of the fullerene \( C_{60} \) we used a vacuum deposition technique carried out with a Vacuum Evaporator JEE-400 (JEOL, Japan) with a vacuum of about \( 10^{-5} \) Pa in a bell-jar with a diameter of 240 mm and h = 270 mm. The bell-jar envelopes two pairs of electrodes; one pair of electrodes is fitted with a pair of heater holders and the other pair of electrodes is fitted with a pair of fullerene holders. Vacuum pressure is accurately measured by a built-in Penning and Pirani gauge. After deposition of thin films on the white floatglass samples they were covered by white floatglass and fixed on edges to protect from air influence to form harmonized filters. The thickness of the fullerene \( C_{60} \) film was about 62 nm although it is contemplated the film could have a thickness from about 5 to about 500 nm, and more preferably from about 30 to about 100 nm. Sample rotation (0°, 90°, 180°, 270°), i.e., polarization plane rotation in N-S and W-E plane, did not show any changes in magnetic field intensity, which indicates that the samples were homogeneous.

[0147] A pair of harmonized filters 32 were mounted into a pair of eye glass frames with one harmonized filter mounted into separate eye glass frames for each eye to form a pair of harmonized eye glasses. These glasses were worn by subjects to provide harmonized light to the eyes of a subject wearing the glasses.

[0148] In our experiment we choose four measuring loci on the human head to place separate EEG electrodes. During normal brain function the EEG signals from each electrode (Fp1, Fp2, F3, F4) should be roughly the same in terms of amplitude. Since the clock cycle of the human brain waves obey the golden ratio (Weiss, 2003), we expect in our experiment that on all four measuring positions (Fp1, Fp2, F3, F4) the power intensity will change under the influence of exposure to harmonized light. We made twelve measurements, before and after the patient’s eyes were exposed for 10 minutes to the diffusion of sun light and Harmonized Light, respectively. Experiments were carried out under standard clinical procedure at the Medical School, University of Belgrade and Hospital of Military Academy-VMA, Belgrade. Results strongly indicate that there are objective (EEG signals) and subjective (patient statements) differences.

[0149] Proper human brain function is indicated when the EEG signals from locations Fp1, Fp2, F3, F4 are of the same frequency and amplitude. A human subject was first exposed to sunlight and his or her EEG signals were measured in the four locations and the results of the EEG signals are shown in Fig. 28a with the X axis plotting frequency in Hz and the Y axis plotting frequency in units of microvolts squared over Hz or \( \mu V^2/Hz \). The EEG signals received from the four electrode locations were substantially different from one another as can be seen in the plots. According to PET (Positron Emission Tomography) the brain activity on Fp1, Fp2, F3, F4 locations should be the same when the human subject views a complex scene. Further, three of the electrodes (Fp1, F3, and F4) showed low activity and while only one signal, Fp2 showed a good response.

[0150] Next, the human subject wore the pair of harmonized eye glasses and after 10 minutes of exposure to harmonized light the EEG readings showed a substantial positive improvement. All four EEG signals were very similar and were of the desired amplitude.

[0151] From a subjective standpoint patients with this brain state explained that before the experiment they were a little depressed, while now they feel better, in a sense relaxed.

[0152] We conducted further experiments by fitting a digital camera with the harmonized filter. We took photographs
without (FIG. 27a) and with the harmonizing filter covering the lens of the camera (FIG. 27b) during cloudy weather. We found out that the photograph taken with the harmonizing filter appeared brighter (FIG. 27b). Without wishing to be bound by any theory, we believe the improvement in EEG signals and the subjective mood of the subjects was due to the harmonized light’s effect on the serotonin/melatonin regulation by exposure to the harmonized light.

Experiments were also conducted to determine the potential effects on the health of human skin by exposing the skin to harmonized light. Twelve human subjects were tested over a two month period in the Department of Dermatology in the School of Medicine, University of Belgrade. Each subject was exposed to harmonized light three times per day for ten minutes session over the two month period. A comparison of measurements of the epidermis of the human subjects taken before and after the exposure to harmonized light (FIG. 29a, b) showed the epidermis had a more healthful structure richer in keratinocytes cells 90 and melanocyte cells 92 in terms of the number of these cells per square area increased by 60% after exposure as determined through standard histological cell counting techniques of a biopsy.

FIGS. 29c,d are photomicrographs showing an increase in the number of collagen cells 94 in a representative subject’s skin comparing the number of collagen cells per square area counted at a time before a treatment (FIG. 29c) and after the treatment by exposure of the skin to harmonized light (FIG. 29d). The photomicrograph was taken with a transmission electron microscope under 200,000 magnification. Tests results showed an increase in the number of collagen cells 94 per square area from 55%–65% in three cases, 65%–75% in seven cases, and more than 75% in two cases.

FIGS. 29e,f are photomicrographs showing an increase in the number of elastin cells 96, in terms of the number of cells per square area, counted before (FIG. 8c) and after a treatment by exposure of a representative subject’s skin to harmonized light. The photomicrographs were taken with a transmission electron microscope under 200,000 magnification. The number of elastin cells increased in an amount from about 48% to about 52% depending on the subject tested. The increase in elastin cells showed an increase in the length of the structures formed from the cells and an improved organization of the cells.

Not wishing to bound to any particular theory, it is believed the harmonized light had a positive impact because fibroblasts have a clathrin coating. Clathrin is meant to refer to a protein complex of three large polypeptide chains and three smaller polypeptide chain to form a triskelion structure. The triskelion structures assemble into structures having icosahedral symmetry (with diameters 120 nm), and, therefore, a resonant energy of the harmonized light interacts with a conformation energy state of clathrin. It is contemplated that the harmonized filters 32 could be used to filter numerous light sources such as from incandescent light bulbs, fluorescent light bulbs, LEDs, LCDs and other sources of light. The incident light can be diffused light, or polarized light as discussed above with reference to FIGS. 5a,b,c. For example a standard fluorescent light fixture having a diffuser element as is commonly present in office lighting fixtures could be replaced by a harmonized filter 32 to provide healthful, harmonized light to persons exposed to the harmonized light.

From the foregoing it will be observed that numerous variations and modifications may be effected without departing from the spirit and scope of the invention. It is to be understood that no limitation with respect to the specific inventions disclosed herein is intended or should be inferred. It is, of course, intended to cover by the appended claims all such modifications as fall within the scope of the claims.

What is claimed is:

1. A method for preparing harmonized water comprising:
   providing a volume of tap water;
   exposing the tap water to a polarized light source having a wavelength from 320 nm to about 1200 nm;
   exposing the tap water to a pulsing homogenic magnetic field with an intensity of from about 0.4 T to about 3.0 T;
   and oscillating a power of the magnetic field in accordance with a Fibonacci series;
   wherein the steps of exposing the tap water to the polarized light and the magnetic field are done for a period of time sufficient to transform the tap water into water having a plurality of harmonized clusters of water molecules wherein each of the water molecules of the harmonized cluster of water molecules has a hydrogen atom bonded to an oxygen atom by a covalent bond having a first length and wherein two adjacent water molecules have a hydrogen bond between an oxygen atom of a first water molecule and a hydrogen atom of a second water molecule and the hydrogen bond having a second length about 1.618 times greater than the first length.

2. The method of claim 1 wherein the tap water is held within a tank during the process.

3. The method of claim 1 wherein the tank has transparent walls.

4. The method of claim 3 wherein the step of exposing the tap water to polarized light comprises utilizing a single light source.

5. The method of claim 3 wherein the step of exposing the tap water to polarized light comprises exposing the tap water to numerous light sources.

6. The method of claim 5 wherein the numerous light sources are positioned symmetrically about the tank.

7. The method of claim 1 wherein the method is carried out in a batch process or in a continuous process.

8. The method of claim 7 wherein the process is a continuous process and wherein the step of providing tap water comprises flowing tap water through a tubing.

9. The method of claim 8 further comprising wherein the magnetic field oscillates between 0.8 T to about 3.0 T.

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