WATER SOLUBLE ELECTROLYZED SILICON DIOXIDE FORMULATION

PRIORITY UNDER 35 U.S.C Section 119(e) & 37 C.F.R. Section 1.78

[001] This nonprovisional application claims priority based upon the following prior United States Provisional Patent Application entitled: Water Soluble Electrolyzed Silicon Dioxide Formulation, Application No.: 63/117,054 filed November 23, 2020, in the name of Christina Cook, which is hereby incorporated by reference for all purposes.

FIELD OF THE INVENTION

[002] The present invention relates generally to partially water soluble formulations for materials such as pharmaceuticals and nutraceuticals, more specifically but not by way of limitation, a formulation of bio-available silicon dioxide fragments combined with vitamins, amino acids,nutrient compounds, and minerals that can be utilized to detoxify, replenish and stimulate growth in living organisms providing benefits such as but not limited to improvements in the aging process.

fluctuations, especially after meals, exercise or stressful times. Since many of these molecules regulate neuronal excitability, a similar change in the composition of interstitial fluid in the central nervous system can lead to uncontrolled brain activity. The endothelial cells forming the blood-brain barrier are highly specialized to allow precise control of the substances that enter or leave the brain.

[005] Accordingly, there is a need to create water-soluble silicon dioxide formulations, which can be administered and absorbed in vivo to detoxify and replenish minerals in the human body.

SUMMARY OF THE INVENTION

[006] It is the object of the present invention to provide a water soluble electrolyzed silicon dioxide formulation operable to provide intracellular detoxification wherein the present invention includes compositions and methods enabling formation and use of a water-soluble and bio- available silicon dioxide employing various forms of electrolysis producing a product to be used as supplement configured to provide cellular detoxification.

[007] Another object of the present invention is to provide a composition containing water soluble silicon dioxide fragments operable to absorb toxins such as but not limited to heavy metals wherein the composition of the present invention includes water-soluble electrolyzed silicon dioxide fragments and water-soluble hydrolyzed silicon dioxide fragments with a dietary supplement such as but not limited to vitamins, minerals, fiber, fatty acid, amino acid, herb, herbal extract or combinations thereof.

[008] A further object of the present invention is to provide a water soluble electrolyzed silicon dioxide formulation operable to provide intracellular detoxification wherein the methods of the present invention include performing a primary hydrolysis reaction by hydrolyzing silicon dioxide with or without electrolysis with an acid and separating the primary hydrolysis reaction into a first liquid portion and a first solid portion wherein the first

phosphoric acid and further includes separating the hydrolyzed silicon dioxide into a liquid portion and a solid portion.

[0013] Still an additional object of the present invention is to provide a composition containing water soluble silicon dioxide fragments operable to absorb toxins such as but not limited to heavy metals wherein the composition can further include a pharmaceutical product, wherein the pharmaceutical product is operable for use as a delivery mechanism for a second pharmaceutical compound.

[0014] Yet another object of the present invention is to provide a water soluble electrolyzed silicon dioxide formulation operable to provide intracellular detoxification wherein the composition of the present invention can further include a mineral or vitamin selected from the group consisting of selenium, zinc, sulfur, iron, vitamin B, vitamin C, vitamin E, vitamin D, retinol or any combination thereof.

[0015] To the accomplishment of the above and related objects the present invention may be embodied in the form illustrated in the accompanying drawings. Attention is called to the fact that the drawings are illustrative only. Variations are contemplated as being a part of the present invention, limited only by the scope of the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] A more complete understanding of the present invention may be had by reference to the following Detailed Description and appended claims when taken in conjunction with the accompanying Drawings wherein:

[0017] Figure 1 is a diagrammed outline of a primary hydrolysis reaction of the present invention; and

[0018] Figure 2 is an outline of the processing procedure of the primary reaction of the present invention; and

[0019] Figure 3 is an outline of the secondary hydrolysis reaction of the present invention; and

DETAILED DESCRIPTION

[0021] Referring now to the drawings submitted herewith, wherein various elements depicted therein are not necessarily drawn to scale and wherein through the views and figures like elements are referenced with identical reference numerals, there is illustrated a silicon dioxide formulation 100 constructed according to the principles of the present invention.

[0022] An embodiment of the present invention is discussed herein with reference to the figures submitted herewith. Those skilled in the art will understand that the detailed description herein with respect to these figures is for explanatory purposes and that it is contemplated within the scope of the present invention that alternative embodiments are plausible. By way of example but not by way of limitation, those having skill in the art in light of the present teachings of the present invention will recognize a plurality of alternate and suitable approaches dependent upon the needs of the particular application to implement the functionality of any given detail described herein, beyond that of the particular implementation choices in the embodiment described herein. Various modifications and embodiments are within the scope of the present invention.

[0023] It is to be further understood that the present invention is not limited to the particular methodology, materials, uses and applications described herein, as these may vary. Furthermore, it is also to be understood that the terminology used herein is used for the purpose of describing particular embodiments only, and is not intended to limit the scope of the present invention. It must be noted that as used herein and in the claims, the singular forms "a", "an" and "the" include the plural reference unless the context clearly dictates otherwise. Thus, for example, a reference to "an element" is a reference to one or more elements and includes equivalents thereof known to those skilled in the art. All conjunctions used are to be understood in the most inclusive sense possible. Thus, the word "or" should be understood as having the definition of a logical "or" rather than that of a logical "exclusive

silica in hot concentrated sodium or potassium hydroxide solution. The aforementioned dissolves alumina and other elements as well. Additionally, hydrofluoric acid(HF) can be utilized and mixtures of HF with Hydrochloric acid(HCl), Sulfuric acid or Nitric acid.

[0026] Referring in particular to the Figures submitted as a part hereof, present technology includes water-soluble hydrolyzed silicon dioxide fragments, compositions and methods of making hydrolyzed silicon dioxide fragments. Reference herein to hydrolyzed silicon dioxide fragments includes water-soluble hydrolyzed silicon dioxide fragments. Silicon dioxide can include a natural quartz, silica, silicic oxide, silicon (IV) oxide, crystalline silica, pure silica, silicea, silica sand with a microporous arrangement of silica and alumina tetrahedral. Silicon dioxide (aluminum sodium dioxido (oxo) silane) can be referred to as sodium aluminosilicate or aluminum sodium silicate. The structure of silicon dioxide can include an outer framework of silica and alumina tetrahedral within which water molecules and exchangeable cations can migrate. An hydrolyzed silicon dioxide fragment concentrate can generally be produced as follows. A two-stage hydrolysis reaction is utilized to produce the hydrolyzed silicon dioxide fragments concentrate, which includes a primary hydrolysis reaction and a secondary hydrolysis reaction. In certain embodiments, the process can be carried out over several days. The primary hydrolysis reaction can be performed over approximately a twenty four hour time period. The primary hydrolysis product is recovered by siphoning and filtering the product. The secondary hydrolysis reaction is performed and the secondary hydrolysis product can also be recovered by siphoning and filtering the product. Electrolysis can be used before the primary and secondary hydrolysis process.

[0027] The primary hydrolysis reaction includes the following steps. In step 101, a first reaction mixture can be prepared including silicon dioxide, phosphoric acid, and water. Step 103, the first reaction mixture is assembled by heating the water and adding the silicon dioxide while agitating the first

and a solid portion, wherein a solid portion of about 1 -25 mg/ml, including about 18-22 mg/ml. In step 113, a second reaction mixture is formed that includes the first solid layer from the primary hydrolysis reaction. Step 115, to the second reaction mixture silicon dioxide, phosphoric acid, and water are added. Step 117, the second reaction mixture is assembled by heating the water and the first solid layer from the primary hydrolysis reaction and further adding silicon dioxide while agitating the second reaction mixture. In step 119, dispensing silicon dioxide at a rate that minimizes clumping in order to form a relatively uniform slurry. Step 121, phosphoric acid is added to the mixture of the first solid layer, water, and silicon dioxide. Addition of the phosphoric acid is at a rate that maintains a desired temperature profile for the second reaction mixture, where agitation can maintain the second reaction mixture as a slurry during the phosphoric acid addition. Heating can be continued as necessary for completion of the secondary hydrolysis reaction. Once completed, the second reaction mixture is cooled to ambient temperature. In step 123, the first liquid layer of the primary hydrolysis reaction and the second liquid layer of the secondary hydrolysis reaction are combined to make a final hydrolysis product. The final hydrolysis product can be characterized as follows. The final hydrolysis product can have an acidic pH, for example, a pH that can range from 4.5 to 5.5.

[0029] Hydrolyzed silicon dioxide fragments can be diluted to desired amounts or percentages by weight. By way of example but not limitation, the final hydrolysis product obtained using the methods described herein can have a solid portion of about 15-25 mg/ml, corresponding to 1.5-2.5% by weight. Dilution can be with sterile, distilled or deionized water. Solutions of the hydrolyzed silicon dioxide fragments and water used to dilute the hydrolyzed silicon dioxide fragments also include various stabilizers and/or preservatives. For example, sodium benzoate or potassium sorbate can be utilized. The water-soluble nature of the hydrolyzed silicon dioxide fragments provides certain benefits when administering the hydrolyzed silicon dioxide

[0031] The composition of the present invention including the hydrolyzed silicon dioxide fragments can be formulated in various ways, typically for oral administration. Examples include forming the composition into one or more various liquid capsules, providing the composition in a liquid or slurry form, and providing the composition as a gel or syrup. Composition components can be entirely mixed together into a single portion, each provided as a separate portion, or various components can be admixed where the whole composition is provided by more than one portion but where a total number of portions are less than the number of components. Other dosage forms suitable for oral administration can be used. In some embodiments, the water-soluble hydrolyzed silicon dioxide fragments are formulated for other routes of administration, such as but not limited to topical, inhalation and injection.

[0032] Referring now to Figure 2, an outline of processing the primary hydrolysis reaction is diagrammed therein. Step 201, place a suitable container on a heating plate and test variant degrees of temperatures. In step 203, test ultra-violet treated reverse osmosis water and untreated reverse osmosis water in the container. In step 205, set the heating plate should be set between 100 and 200 °F. Step 207, water is heated to 150-200 °F. In step 209, once the water temperature reaches between 125 and 175 °F, stirring should be initiated. Step 211, once water temperature reached 150-200 °F, silicon dioxide is transferred slowly to the container with consistent agitation during this process. Step 213, heat the silicon dioxide water mixture to a temperature between 150-200 degrees Fahrenheit. In step 215, add between one hundred and fifty and two hundred milliliters of a phosphoric acid/water solution to the silicon dioxide-water mixture. Step 217, measure the time-point of the primary hydrolysis reaction. In step 219, set the heating plate temperature to a range between 400 and 600 °F. Step 221, remove the container with the mixture from the heating plate and cool at room temperature for twenty four hours. Monitoring of the progression of the hydrolysis reaction with or without electrolysis. The electrolysis process can

subsequent the secondary hydrolysis reaction being completed, the mixture is cooled to ambient temperature.

[0035] Figure 4 submitted herewith diagrams therein an outline for the treatment of the secondary hydrolysis reaction product. Step 401, the mixture from the secondary hydrolysis reaction is cooled for twenty-four hours. In step 403, formation of distinct layers are formed in the container as the result of the secondary hydrolysis reaction, a liquid layer and a solid product layer. Step 405, the liquid layer is siphoned off so as to separate from the solid layer. In step 407, liquid product is filtered as needed. Step 409, the liquid product from the primary hydrolysis reaction is added to the liquid product from the secondary hydrolysis reaction. It should be understood within the scope of the present invention that the quantitative characteristics of the secondary hydrolysis reaction product are similar to those of the primary hydrolysis reaction product.

[0036] The following is an exemplary process of a primary electrolysis procedure that can be added to the hydrolysis reaction products discussed herein. Obtain a suitable container and substantially fill with warm water. Identify and procure a first and second conducting element that is operable to conduct electricity. Place a cover over the container wherein the cover includes to apertures so as to allow the first and second conducting element to be journaled therethrough. Connect the first and second conducting element to a battery. Subsequent connection of both battery terminals electrolysis will begin as evidenced by bubble production. Add an electrolyte to the water in the beaker. Additionally, add sodium to the water to accelerate the process. Execute process to completion.

[0037] It is further contemplated within the scope of the present invention that the silicon dioxide formulation 100 could be employed as a key ingredient to food supplements, nutritional supplements, whole cell treatment systems, environmental solutions, drinks and others in order to facilitate eradication of bacteria, toxins, parasites, fungus and viruses. It should be further understood within the scope of the present invention that

dense silica network will result that can be stabilized by a water/surfactant layer added during the formation.

[0039] It is further contemplated within the scope of the present invention that the an additional step of mixing hypochlorite or hypochlorous acid could be employed. Accomplishment would be executed by utilizing whole bacterial cell, with addition of microbial enzymes such as but not limited to cyanuric acid hydrolase, encapsulated in an inert silica matrix containing an amine group. The amine group functions to permeabilize the cell membrane and accelerate cyanuric acid production. This application would provide benefits in areas of cost reduction as well as lend practicality to whole cell treatment systems.

[0040] Atomic layer deposition is a powerful is a powerful deposition technique for constructing uniform, conformal, and ultra thin films in microelectronics, photovoltaics, catalyst, energy storage, and conversion. The possibility pathways for silicon dioxide atomic layer deposition using silicon tetrachloride and water without a catalyst can be employed within the scope of the present invention. The results show that the silicon tetrachloride has a half reaction is a rate determining step of Si-C1/O-H binds and forming H-C1 bond. The water half-reaction undergoes hydrolysis in condensation processes, which are similar to conventional chemical vapor deposition. In the water half reaction, a large quantity of half reactions are present, and a multitude of water molecules are absorbed on the surface, which results in water assisted hydrolysis of C1 terminated surface and as such accelerates the water reaction. These techniques can be used to improve methods for the preparation of silicon dioxide atomic layer deposition and water based atomic layer depositions of other oxides.

[0041] In the preceding detailed description, reference has been made to the accompanying drawings that form a part hereof, and in which are shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments, and certain variants thereof, have been described in sufficient detail to enable those skilled in the art to practice the

WHAT IS CLAIMED IS:

1. A formulation containing water-soluble silicon dioxide fragments wherein the formulation is configured to provide intracellular detoxification wherein the formulation comprises:

a first liquid portion and a second liquid portion, wherein the first liquid portion is generated from a primary hydrolysis reaction, said second liquid portion being generated from a secondary hydrolysis reaction, wherein said first liquid portion and said second liquid portion be mixed; and

wherein the formulation includes hydrolyzed silicon dioxide fragments and is operable to perform intracellular functions.

2. The formulation containing water-soluble Silicon dioxide fragments as recited in claim 1, wherein the formulation further includes water-soluble hydrolyzed silicon dioxide fragments combined with a dietary supplement.

3. The formulation containing water-soluble Silicon dioxide fragments as recited in claim 2, wherein the dietary supplement is selected from a group consisting of: vitamins, minerals, fiber, fatty acid, amino acid, herbs or herbal extracts.

4. The formulation containing water-soluble Silicon dioxide fragments as recited in claim 3, wherein the first liquid portion includes a primary hydrolysis reaction product that includes water-soluble hydrolyzed silicon dioxide fragments.

5. The formulation containing water-soluble Silicon dioxide fragments as recited in claim 4, wherein the formulation includes water-soluble hydrolyzed silicon dioxide fragments that are complexed with a metal ion.

6. The formulation containing water-soluble Silicon dioxide fragments as recited in claim 5, wherein the metal ion is selected from a group consisting of: sodium, magnesium, iron, cobalt, copper, zinc, manganese, molybdenum or selenium.

ABSTRACT OF THE DISCLOSURE

The present invention relates generally to water soluble formulations for materials such as pharmaceuticals and nutraceuticals. The present invention includes a method and a formulation of bio-available silicon dioxide fragments combined with vitamins, amino acids,nutrient compounds, and minerals that can be utilized to detoxify, replenish and stimulate growth in living organisms providing benefits such as but not limited to improvements in the aging process. The formulation of the present invention is a water-soluble electrolyzed silicon dioxide formulation operable to provide intracellular detoxification wherein the composition of the present invention can further include minerals or vitamins. The water soluble electrolyzed silicon dioxide formulation of the present invention is operable to provide intracellular detoxification wherein the water-soluble hydrolyzed silicon dioxide fragments can be complexed with a metal ion. The formulation is provided in liquid capsules, slurry form, gels or syrups.