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(57) Abstract :
[027] The present invention discloses an improved method of preparation of Nano-fertilizers loaded with plant nutrients. The nutritional supplement composition suitable for oral administration, comprising, but not limited to, one or more plant nutrient comprises nitrogen, calcium, potassium, phosphorus, sulphur, magnesium, boron, manganese, iron, chlorine, copper, molybdenum, zinc, its precursor or its combination. Further, an effective amount nanofertilizers loaded with plant nutrients with nitrogen as per a first volume of aqueous solution; an effective amount of nanoparticulated phosphorus as per a first volume of aqueous solution; an effective amount of nanoparticulated potassium as per a first volume of aqueous solution; wherein the aqueous solution is ultrapure water.

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FORM 2

THE PATENTS ACT, 1970

(39 of 1970)

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The Patent Rules, 2003

COMPLETE SPECIFICATION

(See section 10 and rule 13)

TITLE OF THE INVENTION

"AN IMPROVED METHOD OF PREPARATION OF NANOFERTILIZERS LOADED WITH PLANT NUTRIENTS"

We, applicant(s)

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The following specification particularly describes the nature of the invention and the manner in which it is performed:

FIELD OF THE INVENTION

[001] The present invention relates to an improved method of preparation of Nano-fertilizers loaded with plant nutrients and final produced composition. The invention more particularly relates to a composition that contains the most potent combination of nutrients with clinical studies proven to assist in the maintenance of healthy growth and development of plant.

BACKGROUND OF THE INVENTION

[002] Plant needs many must nutrients to exercise normal function and growth. Exerting outside normal function and the required nutrient level of growth, may cause overall plant growth and healthy decline due to shortage or toxicity. In the time not obtaining the essential nutrients that meets the required for cultivating the plants, there is nutrients and lack. Take generation toxicity when nutrients exceed plant and reduce plant growth or quality.

[003] It would be desirable to develop a method for preparation of Nano-fertilizers loaded with plant nutrients which additionally improves the growth of the plant by providing slow-release macronutrient formulations through Nano-fertilizers for plant growth applications.

[004] However, U.S. Pat. No. 6,261,997 B1 to Rubin et al. discloses slow release of pesticides adsorbed on organically modified clay to prevent leaching in underground and surface water. U.S. Pat. No. 4,219,349 to

Bardsley discloses compositions of calcined clay granules and solution or suspension containing micronutrients (Fe, Zn, Mn, Cu, B, Mo, Cl and S). U.S. Pat. No. 4,849,006 to Milburn et al. discloses a controlled release composition comprising of an organic, biologically active material absorbed on an organically modified clay. U.S. Pat. No. 6,821,928 B2 to Ruskin discloses a method to reduce the rate of diffusion of slow-release materials through polymers and a process for making drip irrigation devices with long term control of root growth. It further, discloses bioactive material such as herbicide that is intercalated into nanoclays to protect against root intrusion in drip irrigation applications. U.S. Pat. No. 3,902,886 to Banin et al. discloses clay attached micronutrients to provide micronutrients to plants. US2009/0169524 A1 to Kalpana et al. discloses biopolymer-based nanocomposites of chitosan, montmorillonite (MMT) and hydroxyapatite for bone growth in medical applications.

[005] The present invention is an improved method of preparation of Nano-fertilizers loaded with plant nutrients and final produced composition, which has various advantages, comprising nitrogen containing macronutrient is adsorbed on HAP nanoparticles and used as a fertilizer. As a result, a better composition and approach to fulfil the aforementioned requirements would be

helpful and desired, thus overcoming the aforementioned issue and deficiencies.

SUMMARY OF THE PRESENT INVENTION

[006] Given the aforementioned drawbacks of the prior art's known types of synthesis techniques and methods for preparation of Nano-fertilizers loaded with plant nutrients that has all of the prior art's advantages and none of the drawbacks.

[007] The present invention is provided with a kind of nano-fertilizer feed additives, by each material composition of following mass percent, but not limited to: Nano-meter selenium 74.8%, biology is more Sugar 25.2%, water, surplus. Further, the Nano-meter selenium partial size is 30-300nm.

[008] Further, the unique the nutritional supplement dietary supplement is provided with the Nano-meter selenium solution for preparing completion need to be protected from light, empty avoiding gas saves. Compared with the conventional technology, a kind of Nano-fertilizer feed additives of the present invention and preparation method thereof have many excellent properties with enhanced efficacy and synergistic effect.

[009] It is further preferred that the prepared composition according to the invention, relate to a method of making a nanofertilizer which includes, but not

limited to, mixing a metal salt and a plant nutrient in an aqueous medium to form a solution; and further, adding a reducing agent to the solution to form a coated metal nanoparticle.

[010] In this respect, before explaining at least one object of the invention in detail, it is to be understood that the invention is not limited in its application to the details of set of rules and to the arrangements of the various models set forth in the following description or illustrated in the working examples. The invention is capable of other objects and of being practiced and carried out in various ways, according to the need of that industry. It should also be noted that the phraseology and language used herein are for descriptive purposes only and should not be construed as limiting.

[011] These together with other objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the disclosure. Refer to the accompanying drawings and descriptive matter in which preferred embodiments of the invention are illustrated for a better understanding of the invention, its operating advantages, and the specific objects attained by its use.

DETAILED DESCRIPTION OF THE INVENTION

[012] While the present invention is described herein by way of example using embodiments and as used throughout this description, the word "may" is used

in a permissive sense (i.e. meaning having the potential to), rather than the mandatory sense, (i.e. meaning must). Further, the words "a" or "an" mean "at least one" and the word "plurality" means "one or more" unless otherwise mentioned. Furthermore, the terminology and phraseology used herein is solely used for descriptive purposes and should not be construed as limiting in scope. Language such as "including," "comprising," "having," "containing," or "involving," and variations thereof, is intended to be broad and encompass the subject matter listed thereafter, equivalents, and additional subject matter not recited, and is not intended to exclude other additives, components, integers or steps. Likewise, the term "comprising" is considered synonymous with the terms "including" or "containing" for applicable legal purposes. Any discussion of documents, acts, materials, devices, articles and the like is included in the specification solely for the purpose of providing a context for the present invention. It is not suggested or represented that any or all of these matters form part of the prior art base or are common general knowledge in the field relevant to the present invention.

[013] In this disclosure, whenever a composition or an element or a group of elements is preceded with the transitional phrase "comprising", it is understood that we also contemplate the same composition, element or group of elements with transitional phrases "consisting of", "consisting", "selected

from the group of consisting of, “including”, or “is” preceding the recitation of the composition, element or group of elements and vice versa.

[014] The present invention discloses an improved method of preparation of Nano-fertilizers loaded with plant nutrients. The Nano-fertilizers composition is comprised of, but not limited to, one or more plant nutrient comprises nitrogen, calcium, potassium, phosphorus, sulphur, magnesium, boron, manganese, iron, chlorine, copper, molybdenum, zinc, its precursor or its combination.

[015] In accordance with an embodiment of the present invention, one or more plant nutrient comprises boron, four water eight borate two sodium, boric acid, calcium borate, antifungin, borsal, disodium tetraborate, Boratex, sodium tetraborate, sodium tetraborate decahydrate or its combination.

[016] In accordance with another embodiment of the present invention, one or more plant nutrient comprises lime, iron chelate, ferritin, zinc oxide, zinc sulphate, chelates of zinc, potassium nitrate, nitrate of lime, magnesium nitrate, ammonium dihydrogen phosphate (ADP), ammonium sulfate, gypsum, superphosphate, ferrous sulfate, calcium carbonate, nitric acid-sulfuric acid ammonium, ATS (Ammonium thiosulphate), ammoniacal liquor, calcium cyanamide, Aden's alkene two ureas, dicyandiamide, magnesium sulfate,

potassium dihydrogen phosphate, isobutyl group two ureas, sodium nitrate, potash, potassium chloride, potassium magnesium sulfate.

Best mode & enablement of the present invention to enable person ordinary skilled in the art

[017] In another exemplary embodiment of the present invention, an effective amount nanofertilizers loaded with plant nutrients with nitrogen as per a first volume of aqueous solution; an effective amount of nanoparticulated phosphorus as per a first volume of aqueous solution; an effective amount of nanoparticulated potassium as per a first volume of aqueous solution; wherein the aqueous solution is ultrapure water.

[018] In accordance with another embodiment of the present invention, an effective amount of the nanofertilizers loaded with plant nutrients composition is less than 50% of a corresponding standard fertilizer composition.

[019] In accordance with another embodiment of the present invention, nanofertilizers loaded with plant nutrients further consisting boric acid, wherein the nanofertilizers is selected from the group consisting of gold, zinc, lead, platinum, palladium, rhodium, tantalum, copper, aluminum, nickel, chromium, iron, cobalt, tin, titanium, ruthenium, tungsten, an alloy thereof, and a combination thereof.

[020] In accordance with another embodiment of the present invention, the nanofertilizer is capable of being transported through the plant cell plasma membrane without mediation of complex polysaccharides and without ATP energy.

[021] In accordance with another embodiment of the present invention, the nanofertilizers loaded with plant nutrients are nanoscale ammonium sulfate in the amount of about 0.005 ppm to about 2.5 ppm of the total weight of the nanofertilizer.

[022] According to another aspect of the present invention, the therapeutically effective compositions of this invention are prepared by mixing the ingredients following generally accepted procedures. Further, the nanofertilizer feed additives, it is characterised in that: by each material composition of following mass percent: nanometer selenium 74.8%, biological polyoses 25.2%, water, surplus.

[023] The aforementioned characteristics make the present invention unique and creative in order to achieve reliability and performance while addressing the limitations of pre-existing processes and techniques. It should be noted that the above description is meant to be illustrative rather than limiting. The aforementioned embodiments, for example, may be utilised in combination

with one another. Many additional embodiments will be obvious to those skilled in the art after reviewing the above discussion.

[024] The above examples are just a few of the many potential parameters and lab conditions that may be created using the fundamental components, and it should be noted that the recital of these compositions is not meant to restrict the scope of this invention in any manner.

[025] The benefits and advantages that the present invention may offer have been discussed above in terms of particular embodiments. These benefits and advantages, as well as any components or restrictions that may cause them to arise or become more apparent, should not be interpreted as critical, required, or essential features of any or all embodiments.

[026] While the present invention has been discussed with reference to certain embodiments, it should be understood that the embodiments are only illustrative and that the invention's scope is not limited to these implementations. There are many changes, adjustments, additions, and enhancements that may be made to the embodiments described above. These changes, alterations, additions, and enhancements are considered to be within the scope of the invention.

We Claim:

1. An improved method of preparation of nanofertilizers loaded with plant nutrients, comprising:

one or more plant nutrient comprises nitrogen, calcium, potassium, phosphorus, sulphur, magnesium, boron, manganese, iron, chlorine, copper, molybdenum, zinc, its precursor or its combination.

2. The composition as claimed in claim 1, wherein one or more plant nutrient comprises boron, four water eight borate two sodium, boric acid, calcium borate, antifungin, borsal, disodium tetraborate, Boratex, sodium tetraborate, sodium tetraborate decahydrate or its combination.

3. The composition as claimed in claim **1**, wherein one or more plant nutrient comprises lime, iron chelate, ferritin, zinc oxide, zinc sulphate, chelates of zinc, potassium nitrate, nitrate of lime, magnesium nitrate, ammonium dihydrogen phosphate (ADP), ammonium sulfate, gypsum, superphosphate, ferrous sulfate, calcium carbonate, nitric acid-sulfuric acid ammonium, ATS (Ammonium thiosulphate), ammoniacal liquor, calcium cyanamide, Aden's alkene two ureas, dicyandiamide, magnesium sulfate, potassium dihydrogen phosphate, isobutyl group two ureas, sodium nitrate, potash, potassium chloride, potassium magnesium sulfate.

4. The composition as claimed in claim 1, wherein an effective amount nanofertilizers loaded with plant nutrients with nitrogen as per a first volume of aqueous solution; an effective amount of nanoparticulated phosphorus as per a first volume of aqueous solution; an effective amount of nanoparticulated potassium as per a first volume of aqueous solution; wherein the aqueous solution is ultrapure water.

5. The composition as claimed in claim **1**, wherein an effective amount of the nanofertilizers loaded with plant nutrients composition is less than 50% of a corresponding standard fertilizer composition.

6. The composition as claimed in claim **1**, wherein nanofertilizers loaded with plant nutrients further consisting boric acid, wherein the nanofertilizers is selected from the group consisting of gold, zinc, lead, platinum, palladium, rhodium, tantalum, copper, aluminum, nickel, chromium, iron, cobalt, tin, titanium, ruthenium, tungsten, an alloy thereof, and a combination thereof.

7. The composition as claimed in claim **1**, wherein the nanofertilizer is capable of being transported through the plant cell plasma membrane without mediation of complex polysaccharides and without ATP energy.

8. The composition as claimed in claim **1**, wherein the nanofertilizers loaded with plant nutrients are nanoscale ammonium sulfate in the amount of about 0.005 ppm to about 2.5 ppm of the total weight of the nanofertilizer.

9. The composition as claimed in claim **1**, wherein the nanofertilizer feed additives, it is characterised in that: by each material composition of following mass percent: nanometer selenium 74.8%, biological polyoses 25.2%, water, surplus.

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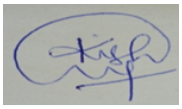
Signature(s): 

Applicant(s)

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ABSTRACT

AN IMPROVED METHOD OF PREPARATION OF NANOFERTILIZERS LOADED WITH PLANT NUTRIENTS

[027] The present invention discloses an improved method of preparation of Nano-fertilizers loaded with plant nutrients. The nutritional supplement composition suitable for oral administration, comprising, but not limited to, one or more plant nutrient comprises nitrogen, calcium, potassium, phosphorus, sulphur, magnesium, boron, manganese, iron, chlorine, copper, molybdenum, zinc, its precursor or its combination. Further, an effective amount nanofertilizers loaded with plant nutrients with nitrogen as per a first volume of aqueous solution; an effective amount of nanoparticulated phosphorus as per a first volume of aqueous solution; an effective amount of nanoparticulated potassium as per a first volume of aqueous solution; wherein the aqueous solution is ultrapure water.

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