CLAIMS

1. A population of particles, each particle comprising

- a construct comprising:
  - at least one solid core,
  - optionally, at least one barrier coating layer over the at least one solid core, and
  - a scaffold associated at least at the outer surface of said at least one solid core or of said barrier coating, if said barrier coating is present in the construct, the scaffold being suitable for support growth of photosynthesizing aquatic organism;
- gas entrapped within said at least one solid core, the gas having a first specific gravity less than that of water and present in an amount sufficient to provide floatation of said particle, once the particle is brought into contact with the water;

said construct having a second specific gravity greater than that of water; and

said at least one solid core, or said barrier coating, if present in said construct, having a permeability configured to allow controlled exchange between the entrapped gas and water external to said construct.

2. The population of particles of claim 1, wherein said solid core comprises or is expanded or porous particulate, such as expanded particulate mineral, particulate organic core or particulate hydrocolloid.

3. The population of particles of claim 1 or 2, comprising at least one layer of said barrier coating over the at least one solid core; said barrier coating preferably comprises a hydrocolloid coating or comprises a long chain organic substance.

4. The population of particles of any one of claims 1 to 3, wherein said scaffold comprises a nutrient composition suitable for supporting growth of photosynthesizing aquatic organism, said nutrient composition preferably comprises at least one nutrient selected from the group consisting of iron (Fe), Zinc (Zn), Copper (Cu), Manganese (Mn), Molybdenum (Mo), Selenium (Se), Chromium (Cr), Cobalt (Co), Iodine (I), Fluorine (F), Magnesium (Mg), Silicon (Si), Nitrogen (N), Phosphorus (P), Sulfur (S), Strontium (Sr), Nikel (Ni), Vanadium (V) and any combination of same, further preferably at least iron and/or Manganese.

5. The population of particles of any one of claims 1 to 4, wherein said scaffold comprises any one or combination of fibers and water-insoluble porous particulate material, said fibers being preferably organic fibers, further preferably non-synthetic organic fibers.

6. The population of particles of any one of claims 1 to 5, comprising a binder, preferably, said binder binds between any one or combination of (i) said fibers of the scaffold and said outer surface of the particulate (ii) fibers of the scaffold; (iii) fibers of said scaffold and water-insoluble porous particulate material, if present in the scaffold.

7. The population of particles of any one of claims 1 to 6, wherein said gas is selected from the group consisting of air and CO_2.

8. The population of particles of any one of claims 1 to 7, wherein said particles have an average size between the micrometer range and millimeter range.

9. A method of producing a population of particles, the method comprising

mixing solid core material, optionally having at least one layer of barrier coating over the solid core, with a scaffold forming material under conditions suitable to allow association of the scaffold material to at least an outer surface of the solid core;

wherein said solid core material comprises gas entrapped therein, the gas having a first specific gravity less than that of water and is in an amount sufficient to result in floatation of said particle, once the particle is brought into contact with the water;

wherein the combination of at least one solid core, said at least one layer of barrier coating, if present, and the scaffold having a second specific gravity greater than that of water; and

wherein the combination of the solid core, the at least one layer of barrier coating, if present, the scaffold and the gas is selected to provide, in the resulting particle, controlled exchange between the entrapped gas and water external to said construct, once said particle is brought into contact with water.

10. The method of claim 9, wherein said population of particles is as defined in any one of claims 1 to 8.

11. The method of claim 9 or 10, comprising supplementing at least said scaffold with a nutrient composition, said supplementing preferably comprises contacting said scaffold material with a solution of said nutrient composition, suitable for supporting growth of algae, said contacting being prior to or after mixing the scaffold material with the solid core, said

nutrient composition preferably comprises at least one nutrient selected from the group consisting of iron (Fe), Zinc (Zn), Copper (Cu), Manganese (Mn), Molybdenum (Mo), Selenium (Se), Chromium (Cr), Cobalt (Co), Iodine (I), Fluorine (F), Magnesium (Mg), Silicon (Si), Nitrogen (N), Phosphorus (P), Sulfur (S), Strontium (Sr), Nikel (Ni), Vanadium (V) and any combination of same, more preferably at least Fe and/or Mn.

12. The method of any one of claims 9 to 11, comprising contacting said solid core material with a barrier composition suitable for forming said at least one layer of barrier coating over said solid core.

13. The method of any one of claims 9 to 12, comprises applying a binder within and/or over said at least one layer of barrier coating, if said at least one layer of barrier coating is present, or over said solid core, prior to or concomitant with association of the scaffold.

14. The method of any one of claims 9 to 13, comprising active introduction of said gas into said solid core, said gas being selected from the group consisting of air and CO2, and said active introduction comprises preferably any one of bubbling of the gas, gas permeation, gas releasing chemical reaction.

15. The method of any one of claims 9 to 14, comprising controlling dimensions of said particles in said population, said controlling comprises preferably selecting particles within a specific size or size range, preferably selecting particles having a size below 1cm.

16. A method for carbon dioxide sequestration, comprising distributing a population of particles over a selected area of body of water comprising at least one photosynthesizing aquatic organism and being open to a source of carbon dioxide to be sequestered; wherein said population of particles comprise a construct comprising:

- at least one solid core,
- optionally, at least one barrier coating layer over the at least one solid core, and
- a scaffold associated at least at the outer surface of said at least one solid core or of said barrier coating, if said barrier coating is present in the construct, the scaffold being suitable for support growth of the photosynthesizing aquatic organism;
- gas entrapped within said at least one solid core, the gas having a first specific gravity less than that of water and present in an amount sufficient to provide floatation of said particle, once the particle is brought into contact with the water;

said construct having a second specific gravity greater than that of water; and

said at least one solid core, or said barrier coating, if present in said construct, having a permeability configured to allow controlled exchange between the entrapped gas and water external to said construct.

17. The method of claim 16, wherein said population of particles is as defined in any one of claims 1 to 8, or obtained by a method of any one of claims 9 to 15.