for example by attaching charged groups that increase the zeta potential of the nanoparticles.

[0027a] In one aspect, there is provided a process for generating a stable colloidal dispersion of nanoparticles, useful for jetting, comprising: heating an acid solution with agitation, adding a host vessel molecule comprising a native or modified polysaccharide, cavitand, simple sugar, simple polyol or other similarly structured molecule to the acid solution with agitation to form a gel, adding a solid guest particle to the gel at temperature ranging between 40° C and 100° C, with agitation, to form a mixture, stirring the mixture at a set temperature for a set time for particle size reduction and annealing, quenching the mixture, and separating the unreacted host vessel component from the mixture to obtain a stabilized colloidal dispersion of nanoparticles within the gel.

[0027b] In another aspect, there is provided a method for reducing the particle size of a solid to nanoparticle dimensions, comprising: adding the solid as a guest particle to a structured fluid matrix of host vessel molecules formed by dispersing a native or modified polysaccharide, cavitand, simple sugar, simple polyol, or other similarly structured molecules, in an acid medium, and excluding any reduction of the particle size of the solid prior to adding to the structured fluid matrix, wherein the particle size achieved by the solid is limited by the structural constraints of the gel and is in nanoparticle dimensions.

[0027c] In another aspect, there is provided a method for preparing a stable colloidal dispersion of nanoparticles for jetting comprising the steps of: initiating cavitation of a solid guest particle in a high viscosity fluid matrix formed by dispersing a modified polysaccharide, cavitand, simple sugar, simple polyol or other similarly structured molecules in an acid medium, wherein a colloidal dispersion of nanoparticles results, and stabilizing the resulting colloidal dispersion by caramelizing cyclodextrins, polysaccharides, or other carbohydrates onto the surface of the nanoparticles.

[0027d] In one aspect, there is provided a high viscosity structured fluid matrix useful for reducing the particle size of a guest solid, comprising host vessel molecules selected

from the group of native or modified polysaccharides, cavitands, simple sugars, simple polyols, other similarly structured molecules, and mixtures thereof, dispersed in an acid medium to form a gel, wherein the particle size of the solid is reduced or limited upon incorporation into the gel.

[0028] In yet a further example, disclosed herein is a distinctive process technology useful to prepare dispersions for jetting and other stable colloidal dispersions of nanoparticles, by initiating cavitation to reduce the size of solid guest particles in a high viscosity structured fluid.

[0029] The structured fluids disclosed herein are prepared by mixing components that are easily removed by membrane filtration. These components include, but are not limited to cavitands, modified polysaccharides, native polysaccharides, simple sugars, such as dextrose, fructose or glucose, simple polyols, such as ethylene glycol, propylene glycol, glycerin, sorbitol, xylitol and the like, polyphosphoric acids, mixtures of two or more of these components, and combinations of the mixture with aldehydes or polyaldehydes.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] FIG. 1 shows the helical structure of amylose from starch;

[0031] FIG. 2 is a chemical structure of β-cyclodextrin;

[0032] FIG. 2a is a schematic representing structures and dimensions for α, β, and γ - cyclodextrins; and

[0033] FIG. 3 shows a computer generated space filled model of β-cyclodextrin.

DETAILED DESCRIPTION OF THE INVENTION

[0034] Before describing the inventive compositions and processes in detail, it should be understood that the invention is not limited to the specific components, amounts of components, or applications for use set forth herein. The inventions may include other embodiments and may be practiced in various ways, as one skilled in the art would understand from the description.

for example by attaching charged groups that increase the zeta potential of the nanoparticles.

[0027a] In one aspect, there is provided a process for generating a stable colloidal dispersion of nanoparticles, useful for jetting, comprising: heating an acid solution with agitation, adding a host vessel molecule comprising a native or modified polysaccharide, cavitand, simple sugar, simple polyol or other similarly structured molecule to the acid solution with agitation to form a gel, adding a solid guest particle to the gel at temperature ranging between 40° C and 100° C, with agitation, to form a mixture, stirring the mixture at a set temperature for a set time for particle size reduction and annealing, quenching the mixture, and separating the unreacted host vessel component from the mixture to obtain a stabilized colloidal dispersion of nanoparticles within the gel.

[0027b] In another aspect, there is provided a method for reducing the particle size of a solid to nanoparticle dimensions, comprising: adding the solid as a guest particle to a structured fluid matrix of host vessel molecules formed by dispersing a native or modified polysaccharide, cavitand, simple sugar, simple polyol, or other similarly structured molecules, in an acid medium, and excluding any reduction of the particle size of the solid prior to adding to the structured fluid matrix, wherein the particle size achieved by the solid is limited by the structural constraints of the gel and is in nanoparticle dimensions.

[0027c] In another aspect, there is provided a method for preparing a stable colloidal dispersion of nanoparticles for jetting comprising the steps of: initiating cavitation of a solid guest particle in a high viscosity fluid matrix formed by dispersing a modified polysaccharide, cavitand, simple sugar, simple polyol or other similarly structured molecules in an acid medium, wherein a colloidal dispersion of nanoparticles results, and stabilizing the resulting colloidal dispersion by caramelizing cyclodextrins, polysaccharides, or other carbohydrates onto the surface of the nanoparticles.

[0027d] In one aspect, there is provided a high viscosity structured fluid matrix useful for reducing the particle size of a guest solid, comprising host vessel molecules selected

for example by attaching charged groups that increase the zeta potential of the nanoparticles.

[0028] In yet a further embodiment, the invention is a distinctive process technology useful to prepare dispersions for jetting and other stable colloidal dispersions of nanoparticles, by initiating cavitation to reduce the size of solid guest particles in a high viscosity structured fluid.

[0029] The structured fluids of the invention are prepared by mixing components that are easily removed by membrane filtration. These components include, but are not limited to cavitands, modified polysaccharides, native polysaccharides, simple sugars, such as dextrose, fructose or glucose, simple polyols, such as ethylene glycol, propylene glycol, glycerin, sorbitol, xylitol and the like, polyphosphoric acids, mixtures of two or more of these components, and combinations of the mixture with aldehydes or polyaldehydes.

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[0035] Terminology used herein is not intended to be limiting. The use of "including", "containing", "constituting", "comprising" or "having" and any other variations thereof is not limited to the items recited or listed and is intended to encompass equivalents and additional items. Use of singular terms are intended to include the plural form.

[0036] Numerical ranges described herein include all values from the lowest value to the highest value.