Proposed CLAIMS

(Clean and re-numbered)

1. A liquid formulation composition, comprising

a solvent comprising water; and

a surfactant dispersed or dissolved in the solvent, wherein the surfactant comprises a phospholipid,

wherein the liquid formulation composition is an emulsion and is characterized by

a surface tension of less than about 60 mN/m, and

a pH value from about 5.0 to about 7.4.

2. The liquid formulation composition of claim 1, wherein the solvent further comprises one of ethanol, glycerol, medical silicone oil and edible vegetable oil, or a combination thereof, and wherein the surface tension of the liquid formulation composition is less than about 40 mN/m and wherein the pH value of the liquid formulation composition is from about 6.0 to about 7.4.

3. The liquid formulation composition of claim 1 or 2, wherein the surfactant is a natural surfactant or a synthetic surfactant, or a combination thereof.

4. The liquid formulation composition of claim 3, wherein the surfactant comprises a natural phospholipid, or a combination thereof.

5. The liquid formulation composition of claim 3, wherein the surfactant comprises a pulmonary surfactant.

6. The liquid formulation composition of any of the preceding claims, further comprising an active pharmaceutical ingredient, wherein the active pharmaceutical ingredient is selected from one of medicines for treating rhinitis, sinusitis, lower respiratory tract inflammation, otitis media, otitis externa, xerostomia, xerophthalmia, xeromycteria, or a combination thereof.

7. The liquid formulation composition of any one of the preceding claims, further comprising one of bacteriostatic agent, flavoring agent, stabilizer, antioxidant, or a combination thereof.

8. The liquid formulation composition of claim 7, wherein

the bacteriostatic agent comprises one of parabens or its salts, benzoic acid or its salts, benzyl alcohol, phenylethanol, phenylacetic acid, phenoxyethanol, lauric acid monoglyceride, chlorobutanol, sorbic acid or its salts, calcium propionate, sodium propionate, dehydroacetic acid or its salts, sodium diacetate, benzalkonium chloride, benzalkonium bromide, cetrimide, chlorhexidine acetate, propanediol, carbon dioxide, nisin, natamycin, momordicin, thimerosal, mercuric nitrate, or a combination thereof;

the flavoring agent comprises one of menthol, borneol, lemon oil, patchouli oil, cinnamon oil, jujube tincture, vanillin, peppermint oil, rose oil, eucalyptus oil, spearmint oil, eugenol, citral, jasmine extract, chrysanthemum extract, osmanthus extract, benzyl alcohol, phenylethanol, terpineol, methyl cyclopentenolone, α-amyl cinnamic aldehyde, butyric acid, hexanoic acid, isoamyl acetate, benzyl acetate, linalyl acetate, ethyl propionate, ethyl butyrate, isoamyl butyrate, benzyl butyrate, isoamyl isovalerate, ethyl hexanoate, ethyl heptanoate, ethyl lactate, allyl hexanoate, γ-nonalactone, ethyl maltol, allyl cyclohexyl propionate, maltol, γ-undecalactone, raspberry ketone, benzyl propionate, butyl butyrate, ethyl isovalerate, ethyl formate, benzyl benzoate, methyl pyrazine, 2,3-dimethyl pyrazine, trimethyl pyrazine, 2-acetyl pyrazine, 4-methyl-5-(β-hydroxyethyl) thiazole, 2-acetyl thiazole, 2,3,5,6-tetramethyl pyrazine, hexadecanal, ethyl vanillin, hydroxyl citronellal, or a combination thereof;

the stabilizer comprise one of lecithin, poloxamer, saponin, tannin, glycerin fatty acid ester, sucrose fatty acid ester, propanediol fatty acid ester, cholesterol, cholesterol ester, polyethylene glycol, cellulose or its derivatives, dextrin, Arabic gum, tragacanth gum, pectin cellulose cheese, gelatin, alginic acid, or a combination thereof; and

the antioxidant comprises one of tert-butyl hydroxy anisole, butylated hydroxytoluene, tert-butyl hydroquinone, propyl gallate, ascorbyl palmitate, dilauryl thiodipropionate, 4-hexyl resorcinol, tocopherol, L-ascorbic acid, D-sodium erythorbate, tea polyphenols, rosemary extract, ginger extract, sugar alcohols, amino acids, or a combination thereof.

9. The liquid formulation composition of claim 8, wherein

the content of the surfactant is in the range from about 0.0001 wt% to about 25.0 wt%,

the content of the solvent is in the range from about 63.0 wt% to about 99.9879 wt%,

the content of the bacteriostatic agent is in the range from about 0.001 wt% to about 2.0 wt%,

the content of the flavoring agent is in the range from about 0.01 wt% to about 5.0 wt%, and

the content of the antioxidant is in the range from about 0.001 wt% to about 5.0 wt%.

10. A liquid formulation composition, comprising

a solvent comprising water; and

liquid particles dispersed in the solvent, the liquid particles comprising a surfactant, wherein the surfactant comprises a phospholipid,

wherein

the liquid formulation composition is an emulsion;

the volume average particle size of the liquid particles is less than about 100 μm; and

the liquid formulation composition is characterized by a surface tension of less than about 60 mN/m and an absolute value of zeta potential of greater than about 15 mV.

11. The liquid formulation composition of claim 10, wherein the solvent further comprises ~~is~~ one of ~~water,~~ ethanol, glycerol, medical silicone oil and edible vegetable oil, or a combination thereof.

12. The liquid formulation composition of claim 10 or 11, wherein the absolute value of zeta potential of the liquid formulation composition is greater than about 20 mV and wherein the pH value of the liquid formulation composition is from about 5.0 to about 7.4.

13. The liquid formulation composition of any one of claims 10-12, wherein the

surfactant is a natural surfactant or a synthetic surfactant, or a combination thereof.

14. The liquid formulation composition of any one of claims 10-13, wherein the liquid formulation composition further comprises one of bacteriostatic agent, flavoring agent, stabilizer, antioxidant, or a combination thereof.

15. The liquid formulation composition of claim 14, wherein

the bacteriostatic agent comprises one of parabens or its salts, benzoic acid or its salts, benzyl alcohol, phenylethanol, phenylacetic acid, phenoxyethanol, lauric acid monoglyceride, chlorobutanol, sorbic acid or its salts, calcium propionate, sodium propionate, dehydroacetic acid or its salts, sodium diacetate, benzalkonium chloride, benzalkonium bromide, cetrimide, chlorhexidine acetate, propanediol, carbon dioxide, nisin, natamycin, momordicin, thimerosal, mercuric nitrate, or a combination thereof;

the flavoring agent comprises one of menthol, borneol, lemon oil, patchouli oil, cinnamon oil, jujube tincture, vanillin, peppermint oil, rose oil, eucalyptus oil, spearmint oil, eugenol, citral, jasmine extract, chrysanthemum extract, osmanthus extract, benzyl alcohol, phenylethanol, terpineol, methyl cyclopentenolone, α-amyl cinnamic aldehyde, butyric acid, hexanoic acid, isoamyl acetate, benzyl acetate, linalyl acetate, ethyl propionate, ethyl butyrate, isoamyl butyrate, benzyl butyrate, isoamyl isovalerate, ethyl hexanoate, ethyl heptanoate, ethyl lactate, allyl hexanoate, γ-nonalactone, ethyl maltol, allyl cyclohexyl propionate, maltol, γ-undecalactone, raspberry ketone, benzyl propionate, butyl butyrate, ethyl isovalerate, ethyl formate, benzyl benzoate, methyl pyrazine, 2,3-dimethyl pyrazine, trimethyl pyrazine, 2-acetyl pyrazine, 4-methyl-5-(β-hydroxyethyl) thiazole, 2-acetyl thiazole, 2,3,5,6-tetramethyl pyrazine, hexadecanal, ethyl vanillin, hydroxyl citronellal, or a combination thereof;

the stabilizer comprises one of lecithin, poloxamer, saponin, tannin, glycerin fatty acid ester, sucrose fatty acid ester, propanediol fatty acid ester, cholesterol, cholesterol ester, polyethylene glycol, cellulose or its derivatives, dextrin, Arabic gum, tragacanth gum, pectin cellulose cheese, gelatin, alginic acid, or a combination thereof; and

the antioxidant comprises one of tert-butyl hydroxy anisole, butylated

hydroxytoluene, tert-butyl hydroquinone, propyl gallate, ascorbyl palmitate, dilauryl thiodipropionate, 4-hexyl resorcinol, tocopherol, L-ascorbic acid, D-sodium erythorbate, tea polyphenols, rosemary extract, ginger extract, sugar alcohols, amino acids, or a combination thereof.

16. The liquid formulation composition of claim 15, wherein

the content of the surfactant is in the range from about 0.1 wt% to about 25.0 wt%,

the content of the solvent is in the range from about 58.0 wt% to about 99.877 wt%,

the content of the bacteriostatic agent is in the range from about 0.001 wt% to about 2.0 wt%,

the content of the flavoring agent is in the range from about 0.01 wt% to about 5.0 wt%,

the content of the stabilizer is in the range from about 0.01 wt% to about 5.0 wt%, and

the content of the antioxidant is in the range from about 0.001 wt% to 5.0 wt%.

17. A liquid formulation composition, comprising

an active pharmaceutical ingredient;

a solvent comprising water; and

liquid particles dispersed in the solvent, the liquid particles comprising a surfactant, wherein the surfactant comprises a phospholipid,

wherein

the liquid formulation composition is an emulsion;

the volume average particle size of the liquid particles is less than about 100 μm;

the active pharmaceutical ingredient is selected from one of medicines for treating rhinitis, sinusitis, lower respiratory tract inflammation, otitis media, otitis externa, xerostomia, xerophthalmia, xeromycteria, or a combination thereof; and

the liquid formulation composition is characterized by a surface tension of less than about 60 mN/m and an absolute value of zeta potential of greater than about 15 mV.

18. A medicament delivery device, comprising

a containment vessel for holding a liquid comprising an outlet; and

a liquid formulation composition held in the containment vessel,

wherein

the containment vessel is configured to function as a spraying or dropping device, allowing controlled spraying or dropping of the liquid formulation composition out of the outlet;

the liquid formulation composition is an emulsion or a solution and comprises a solvent and, a surfactant dissolved therein, wherein the surfactant comprises a phospholipid; and

the liquid formulation composition is characterized by a surface tension of less than about 60 mN/m and a pH value from about 5.0 to about 7.4.

19. The medicament delivery device of claim 18, wherein the containment vessel is configured to function as a sprayer, allowing controlled spraying of the liquid formulation composition out of the outlet.

20. The medicament delivery device of claim 18, wherein the containment vessel is configured to function as a dropping device, allowing controlled dropping of the liquid formulation composition out of the outlet.

21. The medicament delivery device of claim 18-20, wherein the pH value of the liquid formulation composition is from about 6.0 to about 7.4 and the surface tension of the liquid formulation composition is less than about 40 mN/m.

22. The medicament delivery device of any of claims 18-21, wherein the surfactant is a natural surfactant or a synthetic surfactant, or a combination thereof.

23. The medicament delivery device of claim 22, wherein the surfactant comprises one of natural phospholipid, sterol, pulmonary surfactant, stearic acid, oleic acid, lauric acid, benzalkonium chloride, benzalkonium bromide, cetrimide, sorbitan fatty acid,

polysorbate, polyoxyethylene stearate, polyoxyethylene-fatty alcohol ether, poloxamer, dipalmitoyl phosphatidylcholine, cholesterol, cholesteryl ester, phosphatidyl ethanolamine, phosphatidylglycerol, phosphatidylserine, polyethylene glycol, or a combination thereof.

24. The medicament delivery device of claim 22, wherein the surfactant comprises one of lecithin, sterol, pulmonary surfactant, poloxamer, dipalmitoyl phosphatidylcholine, cholesterol, cholesteryl ester, phosphatidyl ethanolamine, phosphatidylglycerol, phosphatidylserine, polyethylene glycol, or a combination thereof.

25. The medicament delivery device of any of claims 18-24, wherein the liquid formulation composition further comprises an active pharmaceutical ingredient, wherein the active pharmaceutical ingredient is selected from one of medicines for treating rhinitis, sinusitis, lower respiratory tract inflammation, otitis media, otitis externa, xerostomia, xerophthalmia, xeromycteria, or a combination thereof.

26. A medicament delivery device, comprising

a containment vessel for holding a liquid comprising an outlet; and

a liquid formulation composition held in the containment vessel,

wherein

the containment vessel is configured to function as a spraying or dropping device, allowing controlled spraying or dropping of the liquid formulation composition out of the outlet;

the liquid formulation composition is an emulsion or a solution and comprises a solvent and, dispersed therein, liquid particles comprising a surfactant, wherein the surfactant comprises a phospholipid;

the volume average particle size of the liquid particles is less than about 100 μm; and

the liquid formulation composition is characterized by a surface tension of less than about 60 mN/m and an absolute value of zeta potential of greater than about 15 mV.

27. A method for preparing a liquid formulation composition, comprising:

(S1) dissolving or dispersing a surfactant in a solvent to form a solution or stable suspension, wherein the surfactant comprises a phospholipid; and

(S2) adjusting the solution to form a liquid formulation composition characterized by

a surface tension of less than about 60 mN/m, and

a pH value from about 5.0 to about 7.4.

28. A method for preparing a liquid formulation composition, comprising:

(S1) dissolving or dispersing a surfactant in ultrasound of about 40 KHz to about 60 KHz for about 1 minute to about 3 minutes, wherein the surfactant comprises a phospholipid;

(S2) uniformly mixing an active pharmaceutical ingredient, the surfactant and a solvent under a stirring condition characterized by a rotational speed of more than 3000 rpm to form a liquid formulation composition characterized by a surface tension of less than about 60 mN/m and an absolute value of zeta potential of greater than about 15 mV.

29. A method for preparing the liquid formulation composition, comprising:

(S1) dissolving or dispersing a surfactant in a solvent with ultrasound of about 40 KHz to about 60 KHz for about 1 minute to about 3 minutes;

(S2) uniformly mixing an active pharmaceutical ingredient, the surfactant and a solvent under a stirring condition characterized by a rotational speed of more than 3000 rpm to form a liquid formulation composition in the form of an emulsion, wherein

the liquid formulation composition comprises a solvent and, dispersed therein, liquid particles comprising a surfactant, wherein the surfactant comprises a phospholipid;

the volume average particle size of the liquid particles is less than about 100 μm;

the liquid formulation composition is characterized by a surface tension of less than about 60 mN/m and an absolute value of zeta potential of more

than about 15 mV; and

the active pharmaceutical ingredient is selected from one of medicines for treating rhinitis, sinusitis, lower respiratory tract inflammation, otitis media, otitis externa, xerostomia, xerophthalmia, xeromycteria, or a combination thereof.

30. A method for preparing the medicament delivery device, comprising

(S1) dissolving or dispersing a surfactant in a solvent to form a solution; and

(S2) adjusting the solution to form a liquid formulation composition, wherein

the liquid formulation composition is a solution or a stable emulsion and comprises a solvent and, a surfactant dissolved therein, wherein the surfactant comprises a phospholipid;

the liquid formulation composition is characterized by a surface tension of less than about 60 mN/m and a pH value from about 5.0 to about 7.4, and

(S3) filling the liquid formulation composition into a containment vessel.

31. A method for preparing the medicament delivery device, comprising:

(S1) dispersing a surfactant in ultrasound of about 40 KHz to about 60 KHz for about 1 minute to about 3 minutes;

(S2) uniformly mixing the surfactant with a solvent under a stirring condition characterized by a rotational speed of more than 3000 rpm to form a liquid formulation, wherein

the liquid formulation composition is an emulsion and comprises a solvent and, dispersed therein, liquid particles comprising a surfactant, wherein the surfactant comprises a phospholipid;

the volume average particle size of the liquid particles is less than about 100 μm; and

the liquid formulation composition is characterized by a surface tension of less than about 60 mN/m and an absolute value of zeta potential of more than about 15 mV; and

(S3) filling the liquid formulation composition into a containment vessel.

32. A method for treating, reducing, or preventing one or more diseases or disorders,

comprising

administering to a subject in need thereof the liquid formulation composition of any of claims 1-17, in an amount effective to treat, prevent, or reduce one or more diseases or disorders selected from rhinitis, sinusitis, lower respiratory tract inflammation, otitis media, otitis externa, xerostomia, xerophthalmia and xeromycteria.

33. A method for treating, reducing, or preventing one or more diseases or disorders, comprising

administering to a subject in need thereof a liquid formulation composition, using the medicament delivery device of any of claims 18-26, in an amount effective to treat, prevent, or reduce one or more diseases or disorders selected from rhinitis, sinusitis, lower respiratory tract inflammation, otitis media, otitis externa, xerostomia, xerophthalmia and xeromycteria.