[0003] Manufacturers have sought other quaternary ammonium compounds that can deliver conditioning performance without the drawbacks of BTAC and CETAC. Esterquat quaternary ammonium compounds (esterquats) have been used as a hair conditioning active. Such esterquats are typically made from fatty acids reacted with an amine, such as triethanolamine (TEA) or methyl diethanolamine (MDEA) and then quaternized. Use of fatty acids allows better control over the fatty acid chains reacting with the alkanolamine to make the esteramine, whose amine portion is then quaternized, and provides a "pure" molecule compared with oils containing fatty acids in triglyceride form. Although esterquats are less toxic than BTAC and CETAC from an environmental standpoint, they do not perform as well as BTAC and CETAC as a hair conditioning agent. Esterquats are also usually in a solid or paste form, and require heating/melting or dilution with a solvent, such as IPA or ethanol, which could release volatile organic compounds (VOCs) into the environment.

[0004] There is a need in the art for esterquat compositions that can deliver hair care performance that is better than CETAC and at least equal to BTAC, but also has a better environmental profile than BTAC and CETAC. There is also a need for an esterquat composition that is in a liquid form at higher active levels, such as 50% active or more.

SUMMARY

[0005] In one aspect, the present disclosure refers to a composition comprising: (a) 30% to 100% by weight, based on the weight of the composition, of a mixture comprising: one or more esterquats, wherein the esterquats comprise 55% to 75% by weight of the mixture, and wherein the esterquats are derived from a fatty acid source having at least 50% by weight of unsaturated fatty acid groups; and one or more glycerides, wherein the glycerides comprise 25% to 45% by weight of the mixture; and (b) optionally, 0% to 70% by weight of the composition of a solvent. In one example, the present technology is directed to a composition comprising:

(a) about 30% to about 100% by weight, based on the weight of the composition, of a mixture of one or more esterquats and one or more glycerides, wherein the esterquats comprise about 50% to about 80%, preferably about 55% to about 75% by weight of the mixture, and the glycerides comprise about 20% to about 50%, preferably about 25% to about 45% by weight of the mixture; and

(b) 0% to about 70% by weight, based on the weight of the composition, of a solvent suitable for personal care.

[0006] In some examples, the composition comprises about 30% to about 95%, alternatively about 30% to about 90% by weight of the mixture of one or more esterquats and one or more glycerides, and about 5% to about 70%, alternatively about 10% to about 70% by weight of solvent.

[0007] In another aspect, the present disclosure refers to a formulation comprising: (a) 0.01% to about 30% by weight of a composition active comprising: one or more esterquats in an amount of 55% to 75% by weight based on the weight of the composition active, wherein the esterquats are derived from a fatty acid source having at least 50% by weight of unsaturated fatty acid groups; and one or more glycerides in an amount of 25% to 45% by weight based on the weight of the composition active; (b) optionally, one or more additional components; and (c) diluent to balance the formulation to 100%. In another example, the present technology is directed to a composition that comprises 0.01% to about 30% by weight, based on the weight of the composition, of a composition active comprising one or more esterquats in an amount of about 50% to about 80%, preferably about 55% to about 75% by weight, based on the weight of the composition active, and one or more glycerides in an amount of about 20% to about 50%, preferably about 25% to about 45% by weight based on the weight of the composition active; optionally, one or more additional components; and diluent to balance the composition to 100%. In one example, the composition is a hair conditioning composition.

[0008] In another example, the present disclosure refers to a hair care composition comprising: (a) about 0.01% to about 30% by weight of a composition active, wherein the composition active comprises: at least one esterquat derived from a fatty acid source having C8-C32 carbon chains, wherein the at least one esterquat is derived from a fatty acid source having at least 50% by weight of unsaturated fatty acid groups; and optionally, a glyceride component derived from a fatty acid source having C8-C32 carbon chains, wherein the glyceride component comprises at least one monoglyceride, or diglyceride, or a combination thereof; (b) optionally, one or more additional components; and (c) diluent to balance the formulation to 100%. In a further example, the present technology is directed to a process for preparing a liquid esterquat composition wherein the process comprises (a) reacting a natural oil with an alkanolamine to obtain an intermediate mixture comprising monoesteramines, diesteramines, monoglycerides, diglycerides, glycerin, and free amines; (b) combining the intermediate mixture with an alkylating agent and, optionally, a solvent to form a reaction mixture; and (c) quaternizing the esteramines in the intermediate mixture with the alkylating agent to form esterquats, wherein the resulting composition comprises (i) about 30% to about 100% by weight, based on the weight of the composition, of a mixture of about 50% to about 80% by weight esterquats and about

20% to about 50% by weight glycerides, based on the weight of the mixture, and (ii) solvent in an amount of 0% to about 70% by weight based on the weight of the composition.

[0009] In some examples, the intermediate mixture comprises a solvent, and the esteramines are quaternized in the presence of the solvent to form a resulting composition which comprises about 30% to about 95%, alternatively about 30% to about 90% by weight, based on the weight of the composition, of a mixture of about 50% to about 80% by weight esterquats and about 20% to about 50% by weight glycerides, and solvent in an amount of about 5% to about 70%, alternatively about 10% to about 70% by weight, based on the weight of the composition.

[0010] In yet another example, the present disclosure refers to a composition comprising: (a) 10% to about 90% by weight of a composition active comprising: i. one or more esterquats in an amount of about 50% to about 80% by weight based on the weight of the composition active, wherein the one or more esterquats is derived from a fatty acid source having at least 50% by weight of unsaturated fatty acid groups; and ii. one or more glycerides in an amount of about 20% to about 50% by weight based on the weight of the composition active; (b) optionally, at least one fatty alcohol; and (c) diluent to balance the formulation to 100%, wherein the diluent comprises water, a solvent, or a combination thereof. In another example, the present technology is directed to a hair care composition that comprises 0.01% to about 30% by weight, based on the weight of the composition, of a composition active, wherein the composition active comprises (i) at least one esterquat derived from a fatty acid source having C8-C32 carbon chains, and (ii) optionally, a glyceride component derived from a fatty acid source having C8-C32 carbon chains, wherein the glyceride component comprises at least one monoglyceride, or diglyceride, or a combination thereof,

wherein at least 60% of the carbon chains in the composition active have at least one carbon-carbon double bond. In some examples, at least 50% of the carbon chains having carbon-carbon double bonds have at least two carbon-carbon double bonds.

Claims

1. A composition comprising:

(a) 30% to 100% by weight, based on the weight of the composition, of a mixture comprising:

i. one or more esterquats, wherein the esterquats comprise 55% to 75% by weight of the mixture, and wherein the esterquats are derived from a fatty acid source having at least 50% by weight of unsaturated fatty acid groups; and

ii. one or more glycerides, wherein the glycerides comprise 25% to 45% by weight of the mixture; and

(b) optionally, 0% to 70% by weight of the composition of a solvent.

2. The composition of claim 1, wherein the esterquats are the quaternized reaction product of the fatty acid source and an alkanolamine in a ratio of 1.5 to 3 moles of acyl groups per mole of alkanolamine.

3. The composition of claim 2, wherein the fatty acid source is a natural oil is selected from the group consisting of sunflower oil, canola oil, soybean oil, walnut oil, jojoba oil, palm oil, borage oil, rapeseed oil, safflower oil, and mixtures thereof.

4. The composition of claim 2, wherein the fatty acid source comprises fatty acid methyl esters.

5. The composition of any one of claims 1-4, wherein the fatty acid source has carbon chain lengths of 8 to 32 carbon atoms.

6. The composition of claim 5, wherein the fatty acid source has a saponification value of less than about 225 and an Iodine Value of 50 or greater.

7. The composition of any one of claims 2-6, wherein the alkanolamine is selected from the group consisting of triethanolamine (TEA), methyl diethanolamine (MDEA), ethyl diethanolamine, dimethyl amino-N-(2,3-propanediol), diethylamino-N-(2,3-propanediol), methylamino-N,-N,-bis(2,3-propanediol), ethylamino-N,N-bis(2,3-propanediol) and mixtures thereof.

8. The composition of any one of claims 2-7, wherein the quaternized reaction product is obtained by using an alkylating agent selected from the group consisting of dimethyl sulfate, methyl chloride, diethyl sulfate, benzyl chloride, ethyl benzyl chloride, methyl bromide, and epichlorohydrin.

9. The composition of any one of claims 1-8, wherein the glycerides comprise monoglycerides and/or diglycerides, wherein when the glycerides comprise monoglycerides and diglycerides the monoglycerides and diglycerides are in a ratio of 3:1 to 1:3.

10. The composition of any one of claims 1-9, wherein the solvent is selected from the group consisting of propylene glycol, caprylate/caprate glyceryl esters, glycerol monooleate, glycol ethers, glycerin, sunflower oil, jojoba oil, alkyl lactyl lactates, isopropyl alcohol, and combinations thereof.

11. The composition of claim 10, wherein the composition is a liquid.

12. The composition of claim 11, wherein the solvent is a mixture of alkyl lactyl lactate and glycerin.

13. The composition of claim 3, wherein the mixture is the direct esterification reaction product of sunflower oil reacted with methyl diethanolamine in a ratio of acyl groups to amine of 1.5:1 to 2:1.

14. A formulation comprising:

(a) 0.01% to about 30% by weight of a composition active comprising:

i. one or more esterquats in an amount of 55% to 75% by weight based on the weight of the composition active, wherein the esterquats are derived from a fatty acid source having at least 50% by weight of unsaturated fatty acid groups; and

ii. one or more glycerides in an amount of 25% to 45% by weight based on the weight of the composition active;

(b) optionally, one or more additional components; and

(c) diluent to balance the formulation to 100%.