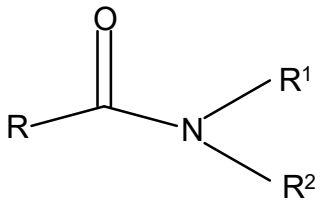
SUMMARY OF THE DISCLOSURE

[0006a] In one aspect, the present technology provides a clear, stable composition comprising:

(A) from about 30% to about 80% by weight, based on the weight of the composition, of one or more esterquats, wherein the one or more esterquats are the quaternized reaction product of a fatty acyl group having an Iodine Value of 40 to 130, and an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1;

(B) from about 20% to about 50% by weight, based on the weight of the composition, of a solvent system, wherein the solvent system comprises a mixture of one or more polyethylene glycols having a number average molecular weight between 130 and 700, and one or more fatty amides having the following general structure:



wherein R has from 6 to 20 carbon atoms, is branched or straight, saturated or has one or more double bonds, optionally containing one or more hydroxyl groups;

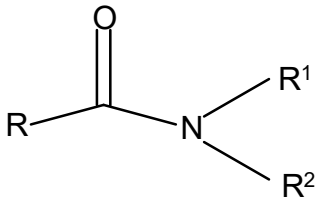
and R^1 and R^2 are independently hydrogen, a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups and can optionally be branched when 3 or more carbon atoms are present;

(C) optionally, 0 up to 30% by weight water;

wherein, the composition has a measured viscosity of less than 5000 cP at 25ºC.

[0007] In a first example, the present technology provides a clear, stable liquid composition comprising: (A) from about 30% to about 80% by weight, based on the weight of the composition, of one or more esterquats, wherein the one or more esterquats are the quaternized reaction product of a fatty acyl source having an Iodine Value of 40 to 130, reacted with an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1; (B) from about 20% to about 50% by weight, based on the weight of the composition, of a solvent system, wherein the solvent system comprises a mixture of one or more polyethylene glycols having a number average molecular weight between 130 and 700, and one or more fatty amides having the following general structure:

[0008]

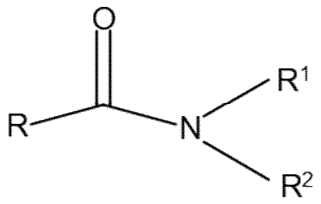


wherein R has from 6 to 20 carbon atoms, is branched or straight, saturated or has unsaturated double bonds, optionally containing one or more hydroxyl groups (a hydroxyl group is an -OH group);

and R^1 and R^2 are independently hydrogen, a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups and can optionally be branched when 3 or more carbon atoms are present; and (C) optionally, 0 up to 30% by weight water; wherein the composition has a measured viscosity of less than 5000 cP at 25ºC.

[0009] In another example, the present technology provides a clear, stable liquid composition comprising (A) from about 30% to about 90% by weight, based on the weight

of the composition, of one or more esterquats, wherein the one or more esterquats are the quaternized reaction product of a fatty acyl source having an Iodine Value of 40 to 130, reacted with an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1; (B) from about 10% to about 50% by weight, based on the weight of the composition, of a solvent system comprising a mixture of one or more glycol ethers selected from the group consisting of 2-butoxyethanol, 2-phenoxyethanol, 2-benzyloxyethanol, 2(2-methoxyethoxy) ethanol, 2(2-ethoxyethoxy) ethanol, dipropylene glycol monomethyl ether, dibutoxyethane, and combinations thereof, and one or more fatty amides having the following general structure:

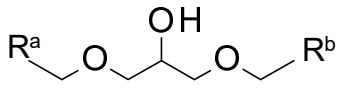


wherein R has from 6 to 20 carbon atoms, is branched or straight, saturated or has unsaturated double bonds, optionally containing one or more hydroxyl groups;

and R^1 and R^2 are independently hydrogen, a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups and can optionally be branched when 3 or more carbon atoms are present; and (C) optionally, 0 up to 30% by weight water; wherein, the composition has a measured viscosity of less than 5000 cP at 25ºC.

[0010] In another example, the present technology provides a clear, stable composition comprising (A) from about 30% to about 90% by weight, based on the weight of the composition, of one or more esterquats, wherein the one or more esterquats are the quaternized reaction product of a fatty acyl source having an Iodine Value of 40 to 130,

and an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1; (B) from about 10% to about 50% by weight, based on the weight of the composition, of a solvent system, wherein the solvent system comprises one or more 1,3-dialkoxy-2-propanols having the following general formula:



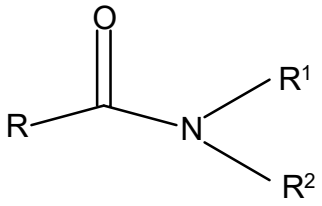
wherein R^a and R^b are independently a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups, and can optionally be branched when 3 or more carbon atoms are present; and (C) optionally, 0 up to 30% by weight water;

wherein, the composition has a measured viscosity of less than 5000 cP at 25ºC.

[0010a] In another aspect, the present technology provides a clear, stable composition comprising:

(A) from about 55% to about 85% by weight, based on the weight of the composition, of one or more esterquats, wherein the one or more esterquats are the quaternized reaction product of a fatty acyl group having an Iodine Value of 40 to 130, and an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1;

(B) from about 15% to about 45% by weight, based on the weight of the composition, of a solvent system comprising one or more fatty amides having the following general structure:



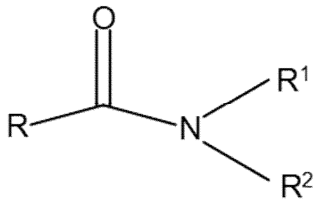
wherein R has from 6 to 20 carbon atoms, is branched or straight, saturated or has one or more double bonds, optionally containing one or more hydroxyl groups;

and R^1 and R^2 are independently hydrogen, a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups and can optionally be branched when 3 or more carbon atoms are present; and

(c) optionally, 0 up to 10% by weight water;

wherein, the composition has a measured viscosity of less than 5000 cP at 25ºC.

[0011] In another example, the present technology provides a clear, stable composition comprising (A) from about 55% to about 85% by weight, based on the weight of the composition, of one or more esterquats, wherein the one or more esterquats are the quaternized reaction product of a fatty acyl source having an Iodine Value of 40 to 130, and an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1; and (B) from about 15% to about 45% by weight, based on the weight of the composition, of a solvent system comprising one or more fatty amides having the following general structure:



wherein R has from 6 to 20 carbon atoms, is branched or straight, saturated or has unsaturated double bonds, optionally containing one or more hydroxyl groups;

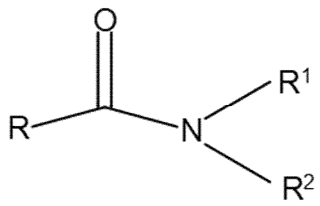
and R^1 and R^2 are independently hydrogen, a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups and can optionally be branched when 3 or more carbon atoms are present, and (C) optionally, 0 up to 10% by weight water, wherein the composition has a measured viscosity of less than 5000 cP at 25ºC.

[0011a] In another aspect, the present technology relates to a fabric softener composition comprising water and the clear stable composition as described above, wherein the one or more esterquats is present in the composition at an actives amount in the range of 2 to 22 weight percent.

[0011b] In another aspect, the present technology relates to a method of making a fabric softener composition comprising the steps of:

(A) providing a concentrated fabric softening composition, wherein the concentrated fabric softening composition comprises (i) from about 30% to about 80% by weight, based on the weight of the concentrated fabric softening composition, of one or more esterquat actives, wherein the one or more esterquat actives are the quaternized reaction product of a fatty acyl source having an Iodine Value of 40 to 130, reacted with an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1;

(ii) from about 20% to about 50% by weight, based on the weight of the concentrated fabric softening composition, of a solvent system, wherein the solvent system comprises a mixture of one or more polyethylene glycols having a number average molecular weight between 130 and 700, and one or more fatty amides having the following general structure:



wherein R has from 6 to 20 carbon atoms, is branched or straight, saturated or has unsaturated double bonds, optionally containing one or more hydroxyl groups;

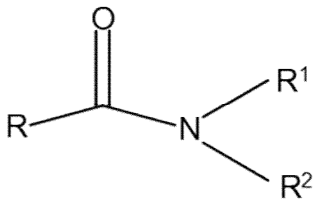
and R^1 and R^2 are independently hydrogen, a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups and can optionally be branched when 3 or more carbon atoms are present and;

(iii) optionally, 0 up to 30% by weight water;

wherein, the concentrated fabric softening composition has a measured viscosity of less than 5000 cP at 25º C; and

(B) mixing the concentrated fabric softening composition in water to form a stable aqueous dispersion comprising from 2% to 22% by weight esterquat actives, based on the total weight of the dispersion, thereby forming the fabric softener composition.

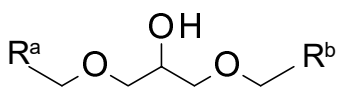
[0012] In a further example, the present technology relates to a method of forming a fabric softener composition, comprising the steps of: (A) providing a concentrated fabric softening composition, wherein the concentrated fabric softening composition comprises (i) from about 30% to about 80% by weight, based on the weight of the concentrated fabric softening composition, of one or more esterquat actives, wherein the one or more esterquat actives are the quaternized reaction product of a fatty acyl source having an Iodine Value of 40 to 130, reacted with an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1; (ii) from about 20% to about 50% by weight, based on the weight of the concentrated fabric softening composition, of a solvent system, wherein the solvent system comprises a mixture of one or more polyethylene glycols having a number average molecular weight between 130 and 700, and one or more fatty amides having the following general structure:



wherein R has from 6 to 20 carbon atoms, is branched or straight, saturated or has unsaturated double bonds, optionally containing one or more hydroxyl groups;

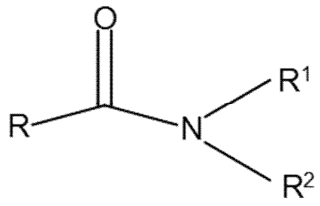
and R^1 and R^2 are independently hydrogen, a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups and can optionally be branched when 3 or more carbon atoms are present; and (iii) optionally, 0 up to 30% by weight water; wherein, the concentrated fabric softening composition has a measured viscosity of less than 5000 cP at 25º C; and (B) mixing the concentrated fabric softening composition in water to form a stable aqueous dispersion comprising from 2% to 22% by weight esterquat actives, based on the total weight of the dispersion, thereby forming the fabric softener composition.

[0013] In a still further example, the present technology provides a method of forming a fabric softener composition, comprising the steps of: (A) providing a concentrated fabric softening composition, wherein the concentrated fabric softening composition comprises (i) from about 30% to about 90% by weight, based on the weight of the concentrated fabric softening composition, of one or more esterquat actives, wherein the one or more esterquat actives are the quaternized reaction product of a fatty acyl source having an Iodine Value of 40 to 130, reacted with an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1; (ii) from about 10% to about 50% by weight, based on the weight of the concentrated fabric softening composition, of a solvent system, wherein the solvent system comprises one or more 1,3-dialkoxy-2-propanols having the following general formula:



wherein R^a and R^b are independently a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups, and can optionally be branched when 3 or more carbon atoms are present; and (C) optionally, 0 up to 30% by weight water; wherein, the concentrated fabric softening composition has a measured viscosity of less than 5000 cP at 25º C; and (B) mixing the concentrated fabric softening composition in water to form a stable aqueous dispersion comprising from 2% to 22% by weight esterquat actives, based on the total weight of the dispersion, thereby forming the fabric softener composition.

[0014] In a still further example, the present technology provides a method of forming a fabric softener composition, comprising the steps of: (A) providing a concentrated fabric softening composition, wherein the concentrated fabric softening composition comprises (i) from about 30% to about 90% by weight, based on the weight of the concentrated fabric softening composition, of one or more esterquat actives, wherein the one or more esterquat actives are the quaternized reaction product of a fatty acyl source having an Iodine Value of 40 to 130, reacted with an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1; (ii) from about 10% to about 50% by weight, based on the weight of the concentrated fabric softening composition, of a solvent system, wherein the solvent system comprises comprising a mixture of one or more glycol ethers selected from the group consisting of 2-butoxyethanol, 2-phenoxyethanol, 2-benzyloxyethanol, 2(2-methoxyethoxy) ethanol, 2(2-ethoxyethoxy) ethanol, dipropylene glycol monomethyl ether, dibutoxyethane, and combinations thereof, and one or more fatty amides having the following general structure:



wherein R has from 6 to 20 carbon atoms, is branched or straight, saturated or has unsaturated double bonds, optionally containing one or more hydroxyl groups;

and R^1 and R^2 are independently hydrogen, a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups and can optionally be branched when 3 or more carbon atoms are present; and (C) optionally, 0 up to 30% by weight water; wherein, the composition has a measured viscosity of less than 5000 cP at 25ºC, and (B) mixing the concentrated fabric softening composition in water to form a stable aqueous dispersion comprising from 2% to 22% by weight esterquat actives, based on the total weight of the dispersion, thereby forming the fabric softener composition.

[0015] In an additional example, the present technology relates to a method of forming a fabric softener composition, comprising the steps of: (A) providing a concentrated fabric softening composition, wherein the concentrated fabric softening composition comprises (i) from about 55% to about 85% by weight, based on the weight of the concentrated fabric softening composition, of one or more esterquat actives, wherein the one or more esterquat actives are the quaternized reaction product of a fatty acyl source having an Iodine Value of 40 to 130, reacted with an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1; (ii) from about 15% to about 45% by weight, based on the weight of the concentrated fabric softening composition, of a solvent system comprising one or more fatty amides having the following general structure:

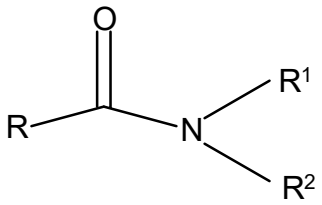
CLAIMS

WHAT IS CLAIMED IS:

1. A clear, stable composition comprising:

(A) from about 30% to about 80% by weight, based on the weight of the composition, of one or more esterquats, wherein the one or more esterquats are the quaternized reaction product of a fatty acyl group having an Iodine Value of 40 to 130, and an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1;

(B) from about 20% to about 50% by weight, based on the weight of the composition, of a solvent system, wherein the solvent system comprises a mixture of one or more polyethylene glycols having a number average molecular weight between 130 and 700, and one or more fatty amides having the following general structure:



wherein R has from 6 to 20 carbon atoms, is branched or straight, saturated or has one or more double bonds, optionally containing one or more hydroxyl groups;

and R^1 and R^2 are independently hydrogen, a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups and can optionally be branched when 3 or more carbon atoms are present;

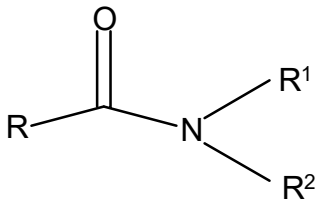
(C) optionally, 0 up to 30% by weight water;

wherein, the composition has a measured viscosity of less than 5000 cP at 25ºC.

2. A clear, stable composition comprising:

(A) from about 55% to about 85% by weight, based on the weight of the composition, of one or more esterquats, wherein the one or more esterquats are the quaternized reaction product of a fatty acyl group having an Iodine Value of 40 to 130, and an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1;

(B) from about 15% to about 45% by weight, based on the weight of the composition, of a solvent system comprising one or more fatty amides having the following general structure:



wherein R has from 6 to 20 carbon atoms, is branched or straight, saturated or has one or more double bonds, optionally containing one or more hydroxyl groups;

and R^1 and R^2 are independently hydrogen, a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups and can optionally be branched when 3 or more carbon atoms are present; and

(c) optionally, 0 up to 10% by weight water;

wherein, the composition has a measured viscosity of less than 5000 cP at 25ºC.

3. The composition of any one of claims 1-2, wherein the fatty acyl source is derived from sunflower oil, canola oil, corn oil, cottonseed oil, flaxseed oil, peanut oil, meadowfoam oil, soybean oil, walnut oil, jojoba oil, palm oil, borage oil, safflower oil, or rapeseed oil, or mixtures thereof, preferably canola oil, LEAR rapeseed oil, or a combination thereof.

4. The composition of any one of claims 1-3, wherein the alkanolamine is TEA, and the fatty acyl chain to alkanolamine ratio is about 1.3:1 to about 2.2:1.

5. The composition of any one of claims 1-3, wherein the alkanolamine is MDEA, and the fatty acyl chain to alkanolamine ratio is about 1.0:1 to about 2.0:1.

6. The composition of any one of claims 1-5, wherein the Iodine Value is 60 to 130.

7. The composition of any one of claims 1-6, wherein the esterquat has a Hansen polarity parameter of greater than about 5.

8. The composition of any one of claims 1-7, wherein the composition has a Volatile Organic Compound (VOC) content of less than 5% by weight, preferably less than 2% by weight.

9. The composition of any one of claims 1-8, wherein the viscosity is less than 3000 cP at 25ºC , preferably less than 1000 cP at 25ºC.

10. The composition of any one of claims 1 and 3-9, wherein the polyethylene glycol comprises polyethylene glycol 200 (PEG 200).

11. The composition of any one of claims 1-10, wherein the fatty amide comprises dimethyl lauramide/dimethyl myristamide.

12. The composition of claim 11, wherein PEG 200 and dimethyl lauramide/dimethyl myristamide are present in the mixture at a weight ratio of 1:3 to 3:1, preferably at a weight ratio of 1:2 to 2:1.

13. The composition of any one of claims 1 and 3-12, wherein the esterquat comprises about 50% by weight, and the solvent system comprises about 30% by weight, based on the weight of the composition.

14. The composition of any one of claims 1, and 3-13, wherein the solvent system has a total Biorenewable Carbon Index (BCI) of at least 90.

15. A fabric softener composition comprising water and the clear stable composition of any one of claims 1-14, wherein the one or more esterquats is present in the composition at an actives amount in the range of 2 to 22 weight percent.

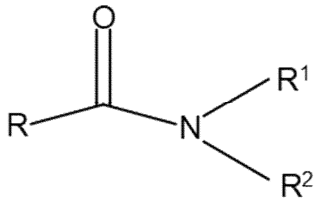
16. The fabric softener composition of claim 15, further comprising at least one ionizable salt.

17. A method of making a fabric softener composition comprising the steps of:

(A) providing a concentrated fabric softening composition, wherein the concentrated fabric softening composition comprises (i) from about 30% to about 80% by weight, based on the weight of the concentrated fabric softening composition, of one or more esterquat actives, wherein the one or more esterquat actives are the quaternized

reaction product of a fatty acyl source having an Iodine Value of 40 to 130, reacted with an alkanolamine at a fatty acyl to alkanolamine molar ratio of about 1.0:1 to about 2.2:1;

(ii) from about 20% to about 50% by weight, based on the weight of the concentrated fabric softening composition, of a solvent system, wherein the solvent system comprises a mixture of one or more polyethylene glycols having a number average molecular weight between 130 and 700, and one or more fatty amides having the following general structure:



wherein R has from 6 to 20 carbon atoms, is branched or straight, saturated or has unsaturated double bonds, optionally containing one or more hydroxyl groups;

and R^1 and R^2 are independently hydrogen, a C1 to C6 alkyl group, or a C2 to C6 alkenyl group, optionally containing one or more hydroxyl groups and can optionally be branched when 3 or more carbon atoms are present and;

(iii) optionally, 0 up to 30% by weight water;

wherein, the concentrated fabric softening composition has a measured viscosity of less than 5000 cP at 25º C; and

(B) mixing the concentrated fabric softening composition in water to form a stable aqueous dispersion comprising from 2% to 22% by weight esterquat actives, based on the total weight of the dispersion, thereby forming the fabric softener composition.

18. The method of claim 17, further comprising the step of adding an ionizable salt.

19. The method of claim 17 or 18, wherein the polyethylene glycol comprises PEG 200.

20. The method of any one of claims 17-19, wherein the fatty amide comprises dimethyl lauramide/dimethyl myristamide.

21. The method of any one of claims 17-20, wherein the viscosity is less than 3000 cP at 25ºC , preferably less than 1000 cP at 25ºC.