only example illustrating the low-solvent fabric softener active composition has a solvent amount of 8% by weight.

[08] In Italian patent application number 2008/1859A, a fabric softening composition is described which does not use solvent. However, it is provided in solid (flake) form which is added directly to water without melting it first and therefore has the drawback of having to use special solid handling equipment for the fabric softener active material.

[09] Thus, there is a need for a fabric softener active system which has reduced or no added solvent. There is also a need that the fabric softener active can flow without having to heat it to very high temperatures. There is also a need that stable, low-viscosity, liquid fabric softener dispersions made from the fabric softener active can be made using standard existing processes known to those skilled in the art.

SUMMARY

[10] It has surprisingly been found that stable, low-viscosity liquid fabric softener compositions can be formulated using fabric softener active systems containing less than 8% added solvent. In one aspect, there is disclosed herein a liquid fabric softening composition comprising:

a. from 1% to 30% by weight of a fabric softening active system comprising at least one quaternary ammonium fabric softening compound and less than 8% added solvent, wherein the quaternary ammonium fabric softening compound is an esterquat that is the quaternized reaction product of triethanolamine reacted with a triglyceride, and wherein the solvent is selected from ethanol, isopropanol, glycerol, other C1 - C6 alcohols, monoglycerides, diglycerides, triglycerides, fatty acids and combinations thereof;

b. from 0% to 2% of an electrolyte concentration aid; and

c. a liquid carrier selected from water or a mixture of greater than 80% water mixed with one or more alcohols having a molecular weight of less than 100 Daltons ;

wherein, the liquid fabric softening composition has a Dispersion Parameter that is less than 100, provided that the fabric softener active system has a viscosity of less than 2000 cP at 80°C, and the fabric softening composition has an initial viscosity that is less than 400 cP; and, the temperature of the liquid carrier during production of the composition is maintained at 65° C or less.

[11] In one example, the liquid fabric softening composition comprises:

the temperature of the liquid carrier during production of the composition is maintained at 65° C or less.

[12] In another aspect, there is disclosed herein a method for conditioning textiles comprising the steps of:

a. providing a liquid fabric softener composition as disclosed herein in a concentration sufficient to soften and condition fabrics under predetermined laundering conditions;

b. contacting one or more fabric articles with the liquid fabric softener composition at one or more points during a laundering process; and

c. allowing the fabric articles to dry or mechanically tumble-drying them.

In a further aspect, there is disclosed herein a method of making a liquid fabric softening composition comprising the steps of:

a. providing a molten quaternary ammonium fabric softener active system comprising at least one esterquat quaternary ammonium fabric softening compound that is the quaternized reaction product of triethanolamine reacted with a triglyceride, and less than 8% by weight of added solvent, based on the weight of the fabric softener active system the solvent being selected from ethanol, isopropanol, glycerol, other C1 - C6 alcohols, monoglycerides, diglycerides, triglycerides, fatty acids and combinations thereof;

b. heating a liquid carrier selected from water or a mixture of greater than 80% water mixed with one or more alcohols having a molecular weight of less than 100 Daltons to a temperature in the range of about 30° C to about 65° C;

c. mixing 1 to 30% by weight of the molten fabric softener active system into the heated liquid carrier; and

d. allowing the mixture to cool.

In one example the present technology is directed to a method for conditioning textiles comprising the steps of:

a. providing a liquid fabric softener composition comprising a fabric softener active system that comprises less than 8% by weight added solvent, wherein the composition is provided in a concentration sufficient to soften and condition fabrics under predetermined laundering conditions;

b. contacting one or more articles with the composition at one or more points during a laundering process; and

c. allowing the articles to dry or mechanically tumble-drying them.

[13] In yet another ~~aspect~~example, there is disclosed herein a liquid fabric softener composition comprising:

CLAIMS

WHAT IS CLAIMED IS:

1. A liquid fabric softening composition comprising:

a. from 1% to 30% by weight of a fabric softening active system comprising at least one quaternary ammonium fabric softening compound and less than 8% added solvent, wherein the quaternary ammonium fabric softening compound is an esterquat that is the quaternized reaction product of triethanolamine reacted with a triglyceride, and wherein the solvent is selected from ethanol, isopropanol, glycerol, other C1 - C6 alcohols, monoglycerides, diglycerides, triglycerides, fatty acids and combinations thereof;

b. from 0% to 2% of an electrolyte concentration aid; and

c. a liquid carrier selected from water or a mixture of greater than 80% water mixed with one or more alcohols having a molecular weight of less than 100 Daltons; wherein,

the liquid fabric softening composition has a Dispersion Parameter that is less than 100, provided that the fabric softener active system has a viscosity of less than 2000 cP at 80°C, and the fabric softening composition has an initial viscosity that is less than 400 cP; and,

the temperature of the liquid carrier during production of the composition is maintained at 65° C or less.

2. The composition of claim 1, wherein the fabric softener active system contains 5% or less added solvent.

3. The composition of claim 1, wherein the fabric softener active system contains 3% or less added solvent.

4. The composition of claim 1, wherein no solvent is added.

5. A method for conditioning textiles comprising the steps of:

a. providing a liquid fabric softener composition according to claim 1 in a concentration sufficient to soften and condition fabrics under predetermined laundering conditions;

b. contacting one or more fabric articles with the liquid fabric softener composition at one or more points during a laundering process; and

c. allowing the fabric articles to dry or mechanically tumble-drying them.

6. A method of making a liquid fabric softening composition comprising the steps of:

a. providing a molten quaternary ammonium fabric softener active system comprising at least one esterquat quaternary ammonium fabric softening compound that is the quaternized reaction product of triethanolamine reacted with a triglyceride, and less than 8% by weight of added solvent, based on the weight of the fabric softener active system the solvent being selected from ethanol, isopropanol, glycerol, other C1 - C6 alcohols, monoglycerides, diglycerides, triglycerides, fatty acids and combinations thereof;

b. heating a liquid carrier selected from water or a mixture of greater than 80% water mixed with one or more alcohols having a molecular weight of less than 100 Daltons to a temperature in the range of about 30° C to about 65° C;

c. mixing 1 to 30% by weight of the molten fabric softener active system into the heated liquid carrier; and

d. allowing the mixture to cool.

7. The method of claim 6, wherein the fabric softener active system comprises 5% or less added solvent.

8. The method of claim 6, wherein the fabric softener active system comprises 3% or less added solvent.

9. The method of claim 6, wherein the fabric softener active system comprises no added solvent.

10. The liquid fabric softening composition of claim 1, wherein the esterquat is made from a triethanolamine reacted with a triglyceride, at a ratio of 1.55 parts fat to one part triethanolamine, where fat is defined as one hydrocarbon chain on the triglyceride, followed by quaternization.

11. The liquid fabric softening composition of claim 1, wherein the esterquat is made by quaternizing the reaction product of a triglyceride reacted with triethanolamine at a molar ratio of fat to triethanolamine in the range of 1.55 to 1.75.

CLAIMS

WHAT IS CLAIMED IS:

1. A liquid fabric softening composition comprising:

a. from 1% to 30% by weight of a fabric softening active system comprising at least one quaternary ammonium fabric softening compound and less than 8% added solvent;

b. from 0% to 2% of an electrolyte concentration aid; and

c. a liquid carrier;

wherein,

the liquid fabric softening composition has a Dispersion Parameter that is less than 100, provided that the fabric softener active system has a viscosity of less than 2000 cP at 80°C, and the fabric softening composition has an initial viscosity that is less than 400 cP; and,

the temperature of the liquid carrier during production of the composition is maintained at 65° C or less.

2. The composition of claim 1, wherein the fabric softening ammonium compound is an esterquat.

3. The composition of claim 2, wherein the esterquat is an esterquat made from triethanolamine.

4. The composition of claim 1, wherein the fabric softening ammonium compound is an amidoamine.

5. The composition of claims 1-4, wherein the fabric softener active system contains 5% or less added solvent.

6. The composition of claims 1-4, wherein the fabric softener active system contains 3% or less added solvent.

7. The composition of claims 1-4, wherein no solvent is added.

8. The composition of claims 1-7 wherein the liquid carrier is water or greater than 80% water mixed with one or more low molecular weight alcohols.

9. A method for conditioning textiles comprising the steps of:

a. providing a liquid fabric softener composition according to claim 1 in a concentration sufficient to soften and condition fabrics under predetermined laundering conditions;

b. contacting one or more fabric articles with the liquid fabric softener composition at one or more points during a laundering process; and

c. allowing the fabric articles to dry or mechanically tumble-drying them.

10. A method of making a liquid fabric softening composition comprising the steps of:

a. providing a molten quaternary ammonium fabric softener active system comprising at least one quaternary ammonium fabric softening compound and less than 8% by weight of added solvent, based on the weight of the fabric softener active system;

b. heating a liquid carrier to a temperature in the range of about 30° C to about 65° C;

c. mixing 1 to 30% by weight of the molten fabric softener active system into the heated liquid carrier; and

d. allowing the mixture to cool.

11. The method of claim 10, wherein the at least one quaternary ammonium fabric softening compound is an esterquat.

12. The method of claim 11, wherein the esterquat is made from triethanolamine.

13. The method of claim 10, wherein the quaternary ammonium fabric softening compound is an amidoamine.

14. The method of claims 10-13, wherein the fabric softener active system comprises 5% or less added solvent.

15. The method of claims 10-13, wherein the fabric softener active system comprises 3% or less added solvent.

16. The method of claims 10-13, wherein the fabric softener active system comprises no added solvent.

17. The method of claims 10-16, wherein the liquid carrier is water or greater than 80% water mixed with one or more low molecular weight alcohols.

18. A liquid fabric softener composition comprising:

a. from 1% to 30% by weight of a fabric softening active system comprising an esterquat fabric softening ammonium compound made from triethanolamine, wherein the fabric softening active system comprises less than 8% solvent;

b. from 0 to 2% of an electrolyte concentration aid; and

c. a liquid carrier;

wherein the liquid fabric softening composition has a Dispersion Parameter that is less than 100, provided that the fabric softener active system has a viscosity of less than

2000 cP at 80° C, and the fabric softening composition has an initial viscosity that is less than 400 cP.

19. The liquid fabric softening composition of claim 1, wherein the quaternary ammonium fabric softening compound is an esterquat made from a triethanolamine reacted with a fatty acid or fat, at a ratio of 1.55 parts fatty acid or fat to one part triethanolamine, where fat is defined as one hydrocarbon chain on the triglyceride, followed by quaternization.

20. The liquid fabric softening composition of claim 1, wherein the quaternary ammonium fabric softening compound is an esterquat made by quaternizing the reaction product of a fatty acid or fat reacted with an alkanolamine at a molar ratio of fatty acid/fat to alkanolamine in the range of 1.55 to 1.75.