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<p>(54) Title: SHAMPOOS WITH INSOLUBLE SILICONE CONDITIONING AGENT AND CATIONIC POLYMER</p> <p>(57) Abstract</p> <p>Provided is an anti-dandruff shampoo composition comprising: (a) from about 8 % to about 40 %, by weight, of deterative surfactant, said composition comprising from about 5 % to about 40 % of anionic deterative surfactant; (b) from about 0.05 % to about 5 %, by weight, of a dispersed, insoluble silicone conditioning agent; (c) from about 0.01 % to about 1.0 %, by weight, of a stabilizing agent for the silicone conditioning agent, said stabilizing agent being a shampoo soluble cationic polymer; (d) from about 50 % to about 91.5 %, by weight, water; wherein said shampoo composition is substantially free of suspending agents selected from the group consisting of crystalline suspending agents and anionic, nonionic, and amphoteric polymeric thickening agents.</p>		

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## SHAMPOOS WITH INSOLUBLE SILICONE CONDITIONING AGENT AND CATIONIC POLYMER

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### Technical Field

The present invention relates to shampoo compositions containing an insoluble silicone conditioning agent. In particular, the present invention relates to shampoo compositions containing an insoluble silicone conditioning agent stably suspended with a low level of cationic polymer.

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### Background of the Invention

Shampoo compositions which both cleanse the hair and condition the hair with insoluble silicone conditioning agents are well known. Among the preferred types of insoluble silicone conditioning agents are nonvolatile polydimethyl siloxanes, which are typically dispersed in the shampoo as an emulsion, wherein the silicone is present as a dispersed phase of droplets in the aqueous shampoo formula. In order for these types of shampoos to be effective and to provide a consistent level of performance, without requiring vigorous shaking of the package in which they are contained, it is conventional practice to suspend them in the composition with the aid of a suspending agent. Since shampoos are likely to remain on shelves or in storage for long periods of time, it is important for the suspending agents to keep the insoluble conditioning agent well suspended for relatively long periods of time. The suspending agents which have become preferred for suspension of insoluble silicone conditioning agents are those which form a crystalline network in the shampoo when the shampoo is stationary, but which allow the composition to readily flow when shear is applied, such as when a user pours it out of a bottle. Examples of such crystalline suspending agents include ethylene glycol distearate and N, N- di-

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(hydrogenated tallow) amido benzoic acid.

Another drawback of crystalline suspending agent is that they require costly heating and cooling steps in the manufacture of the compositions in order to make high quality stable suspensions.

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Yet another important parameter in the formulation of shampoos is lathering. The consuming public often associates high lathering with effective cleaning, and typically prefers high lathering shampoos to low

lathering shampoos from an aesthetic standpoint. Unfortunately, crystalline suspending agents tend to adversely affect lathering performance.

5 Other suspending agents which are known include hydrophilic polymeric thickening agents such as cellulosic gums and crosslinked acrylic acid/acrylate polymers, the latter of which are commonly referred to as carbomers. Although these materials can be effective for suspending insoluble silicone they can impart an undesirable, slimy feel.

10 It is well known in the art to add foaming agents to help compensate for lather reductions caused by suspending agents. Examples of such foaming agents include cocomono- and di-ethanol amide, betaine surfactants soluble longer chain alcohols such as C<sub>12</sub>-C<sub>14</sub> monohydric alcohols, amine oxides, and cationic polymers such as cationic modified xanthan gum and hydroxy-ethyl cellulose. However, the addition of these ingredients does not overcome the other disadvantages of conventional  
15 suspending agents, adds further cost to the shampoo, and in certain cases may also increase harshness of the shampoo.

20 It would be desirable to provide liquid shampoo composition with a stable dispersed insoluble silicone conditioning agent, which also did not require the use of conventional suspending agents such as crystalline suspending agents or polymeric thickening agents to suspend the silicone.

It is therefore an object of this invention to provide shampoos containing insoluble silicone conditioning agents that are suspended without the need for crystalline suspending agents.

25 It is yet another object of this invention to provide shampoos containing insoluble silicone conditioning agents that are suspended without the need for conventional, hydrophilic polymeric thickening agents.

30 It is still another object of this invention to provide compositions, as set forth above, which can be made without the need for costly heating and cooling steps, as conventionally utilized when crystalline suspending agents are employed.

35 It is yet another object of this invention to provide a process for making conditioning shampoos meeting the above objects. These and other benefits as may be apparent or otherwise realized can be obtained according to the present invention, which is described below. Unless otherwise indicated, all percentages are calculated by weight of the total composition, and all ratios are calculated on a weight basis. Unless otherwise indicated, ingredients are based on the active level and therefore

do not include carriers or by-products that may be included in commercially available materials. The present invention may comprise, consist of, or consist essentially of any of the essential and various optional and/or preferred ingredients and elements described herein. The terms "soluble" and "insoluble" shall refer to the solubility characteristics of a particular ingredient in the shampoo composition, unless otherwise specifically indicated. All viscosities and solubilities are determined at 25°C, unless otherwise specifically indicated.

#### SUMMARY OF THE INVENTION

It has now been found that conditioning shampoos meeting the above objects can be achieved. In particular, it has been found that insoluble silicone conditioning agents in the form of dispersed droplets can be suspended in shampoo compositions containing anionic surfactants and relatively low levels of a shampoo-soluble cationic polymer, without the need for crystalline suspending agents or polymeric thickening agents for suspending the particles. By way of theory, and without intending to necessarily limit the invention, it is believed that the cationic polymers hereof form a net-like suspension by bridging micelles of the anionic surfactant. The droplets of insoluble silicone become suspended within this network. It has been found that low levels of cationic polymer can be highly effective for providing stability.

More specifically, the present invention provides a conditioning shampoo composition comprising:

- (a) from about 8% to about 40%, by weight, of detergent surfactant, said composition containing at least about 5%, by weight, of anionic detergent surfactants;
- (b) from about 0.05% to about 5%, by weight, of dispersed droplets of insoluble silicone;
- (c) from about 0.01% to about 1.0%, by weight, of a stabilizing agent for said insoluble silicone, said stabilizing agent being a soluble cationic polymer;
- (d) from about 50% to about 94.5%, by weight, water;

wherein said shampoo composition is substantially free of suspending agents selected from the group consisting of crystalline suspending agents and anionic, nonionic, and amphoteric polymeric thickening agents.

The present invention can provide shampoos with excellent conditioning efficacy, cleansing, and lathering. In addition, the present

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