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CONCENTRATED AQUEOUS SOAP SOLUTION
OF LOW VISCOSITY

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This invention relates to soap compositions and relates more particularly to soap compositions that will form highly concentrated aqueous solutions having a low viscosity and to the highly concentrated aqueous solutions formed from said soap compositions.

Concentrated aqueous soap solutions are useful as stock solutions for the compounding of baths containing a small proportion of soap, such as, for example, scouring baths employed in the finishing of certain types of textile fabrics, as well as for many other applications. However, when the quantity of soap in the concentrated aqueous solutions is raised to above about 15% by weight, the solutions become extremely viscous and stringy and show a tendency to gel, particularly at room temperatures or lower. Frequently, the viscosity of these solutions rise to 5000 or more centipoises. As a result, the handling of these concentrated aqueous soap solutions entails many difficulties which markedly reduce their usefulness.

It is an important object of this invention to provide novel soap compositions which will be free from the foregoing and other disadvantages and which will form highly concentrated aqueous solutions having a low viscosity.

A further object of this invention is to provide soap compositions containing a soap, a mineral oil and an emulsifying agent which will form highly concentrated aqueous solutions having a low viscosity.

Another object of this invention is to provide soap compositions containing a soap and an alkyl oleate which will form highly concentrated aqueous solutions having a low viscosity.

Other objects of this invention will be apparent from the following detailed description and claims.

We have discovered that the viscosity of concentrated aqueous soap solutions, containing more than about 15% by weight of soap, may be reduced to a minimum by the incorporation in said solutions of certain substances or mixtures of substances which function as viscosity depressants. Thus, in accordance with this invention, there is prepared a concentrated aqueous soap solution containing more than about 15% by weight, and preferably between about 15 and 25% by weight, of soap, a mineral oil, preferably in amounts ranging from about 2 to 10% by weight based on the weight of the soap, and an emulsifying agent, preferably in amounts ranging from about 2 to 10% by weight based on the weight of the soap. When the soap employed

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is an oleate such as sodium or potassium oleate, a similar reduction in viscosity may be obtained by adding to the concentrated aqueous soap solution an alkyl oleate, wherein the alkyl group contains from 3 to 10 carbon atoms, preferably in an amount ranging from about 2 to 10% by weight based on the weight of soap. The concentrated aqueous soap solutions prepared in this manner exhibit a viscosity of below 1000 centipoises and frequently exhibit a viscosity of below 100 or even below 50 centipoises so that they may be handled without difficulty.

Suitable emulsifying agents that may be employed in preparing the concentrated aqueous soap solutions include, for example, the polyethylene glycol esters of fatty acids such as lauric, oleic or stearic acids, sulfonated long chain petroleum hydrocarbons, sodium salt of mahogany acid, alkyl aryl sulfonates, sorbitan monolaurate, sorbitan monopalmitate, sorbitan monostearate, sorbitan tristearate, sorbitan monooleate, diethylene glycol monolaurate, polyoxyethylene ethers, alkylated aryl poly-ether alcohols, sulfated fatty acid esters, and Turkey red oil. Although any mineral oil may be employed for preparing the concentrated aqueous soap solutions, it is preferred to employ for this purpose mineral oils having a viscosity of between about 40 and 100 Saybolt Universal units at 100° F.

The following examples are given to illustrate this invention further:

Example I

To an aqueous soap solution containing 20% by weight of sodium oleate and having a viscosity of 6240 centipoises at room temperature, there is added 5% by weight, based on the weight of the soap, of a mineral oil having a viscosity of 50 Saybolt Universal units at 100° F. and 5% by weight, based on the weight of the soap, of a polyethylene glycol ester of stearic acid. After stirring for 10 minutes at 110° C., the solution is cooled to room temperature. The solution formed exhibits a viscosity of only 46 centipoises.

Example II

To an aqueous soap solution containing 20% by weight of sodium oleate and having a viscosity of 6240 centipoises at room temperature, there is added 7.0% by weight, based on the weight of the soap, of a mineral oil having a viscosity of 50 Saybolt Universal units at 100° F. and 3.0% by weight, based on the weight of the soap, of the sodium salt of sulfonated petroleum hydrocarbon. After stirring for 10 minutes at 110° C.,

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the solution is cooled to room temperature. The solution formed exhibits a viscosity of only 18 centipoises.

Example III

To an aqueous soap solution containing 20% by weight of sodium oleate and having a viscosity of 6240 centipoises, there is added 10% by weight of n-butyl oleate based on the weight of the soap. After stirring for 10 minutes at 110° C., the solution is cooled to room temperature. The solution formed exhibits a viscosity of only 41 centipoises.

A similar solution prepared with n-hexyl oleate in place of n-butyl oleate exhibits a viscosity of 38 centipoises at room temperature, and a solution prepared with n-octyl oleate in place of n-butyl oleate exhibits a viscosity of 38 centipoises.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of our invention.

Having described our invention, what we desire to secure by Letters Patent is:

1. A soap composition comprising a concentrated aqueous solution containing from about 15 to 25% by weight of a soap selected from the group consisting of sodium and potassium soaps and, as a viscosity reducing agent therefor, between about 2 to 10% by weight, based on the

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weight of the soap, of an alkyl oleate wherein the alkyl group contains from 3 to 10 carbon atoms.

2. A concentrated aqueous soap solution of low viscosity, comprising an aqueous solution of from about 15 to 25% by weight of an alkali metal oleate, selected from the group consisting of sodium and potassium oleates, and from about 2 to 10% by weight, based on the weight of the soap, of an alkyl oleate wherein the alkyl group contains from 3 to 10 carbon atoms.

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