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SOLUBLE OIL

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This invention relates to a novel soluble oil and methods of preparing and using same.

Broadly, the invention consists in preparing a soluble oil by blending together an oil, oil-soluble sulfonates derived from petroleum hydrocarbons, alcohol amines and carboxylic acids.

In co-pending application Serial No. 725,086, filed May 11, 1934 by Karl T. Steik and Stewart C. Fulton, there is disclosed and claimed broadly, an emulsifying agent comprising a major proportion of oil-soluble sulfonates and a minor proportion of alcohol amine soap. That application also contains specific claims on an emulsifying agent comprising a major proportion of oil-soluble sulfonate and a minor proportion of alcohol amine sulfonate.

One object of the present invention is to claim one of the other species, a composition comprising an alcohol amine soap of a carboxylic acid, disclosed in the co-pending application.

It is a further object of the present invention to disclose and claim a method of stabilizing soluble oils or emulsions prepared by use of either of the species referred to, namely, the combination of oil-soluble sulfonates with either an alcohol amine sulfonate or with an alcohol amine soap of a carboxylic acid. According to the present invention, this stabilization is accomplished by the use of a slight excess of the alcohol amine over the stoichiometric amount required to combine with the carboxylic or sulfonic acid used.

It is known in the prior art that soluble oils, capable of forming emulsions when subsequently mixed with water, can be formed by dissolving in a suitable oil, such as a mineral lubricating oil or a mineral white oil, the oil-soluble alkali soaps of sulfonic acids derived from petroleum hydrocarbons, as for instance the so-called "mahogany" soaps, obtained as a result of treating a mineral lubricating oil fraction with strong sulfuric acid for the preparation of white oil. However, in preparing soluble oils of that type, a relatively large amount of oil-soluble sulfonates must be used and, according to the present invention, this amount may be greatly reduced by substituting in part therefor, a small amount of an alcohol amine soap of a carboxylic acid, or a mixture of an alcohol amine and a carboxylic acid. The oil-soluble sulfonates may be obtained or purified by any of the known methods, but it is particularly preferred, for the present invention, to use oil-soluble sulfonates prepared according to the method described and claimed in co-pending application Serial No. 626,233 filed July 29, 1932 by Hyym E. Buc, now Patent

1,981,799 which comprises isolating oil-soluble sulfonates directly from the alcoholic aqueous solution (resulting from the extraction of the acid-treated oil with alcohol) by agitating with alkali carbonates, drawing off and filtering the upper layer and evaporating the filtrate to dryness. Instead of, or in addition to, the pure or impure mahogany soap, any variety of related sulfonates, which are reasonably soluble in the oil base, may be used, such as sulfonated lard oil, Turkey red oil, sulfated higher fatty alcohols, etc.

Triethanolamine is the preferred alcohol amine as it is available commercially. The product on the market usually consists of a mixture of mono-, di-, and triethanolamine, although pure triethanolamine may be used if desired. Also, other alcohol amines and their mixtures may be used; for instance, propanolamines, etc. One feature of the present invention is the use of a slight excess of alcohol amine over the amount required to neutralize or combine with the carboxylic acid. This excess amine produces more stable emulsions.

Of the carboxylic acids, oleic is generally the most satisfactory, and for a high grade product, the better grades of oleic acid are preferred. Other fatty acids of similar molecular weight (palmitic, lauric, stearic, behenic, etc., linoleic, linolenic, etc.) may be used, also naphthenic acids, rosin acids, or acids formed by the oxidation of oils and waxes, but, in general, it is preferred to use acids having more than 6 carbon atoms and, better still, more than 12 carbon atoms if a single acid is used. Low melting point acids are preferred when fluid products are desired. Highly unsaturated acids are to be avoided where an extra high resistance to oxidation is desired. Mixed acids may also be used, such as those obtained by the oxidation of high molecular weight oils and waxes, particularly paraffin wax. These fatty acids may be used in the free stage or chemically combined with the alcohol amines.

The oil to be used as a base in preparing the soluble oils, according to the present invention, may be a mineral oil or fatty oil, such as vegetable, animal or fish oil of proper viscosity (generally between that of a very light spindle oil and a heavy lubricating oil). The mineral oil may be either lightly refined as by distillation, solvent extraction, clay treating or treatment with dilute acid, or other chemical treating agent, or it may be a highly refined or so-called white oil, such as the products on the market known as Nujol and Marcol. These oils may be used as such or to-

gether with small amounts of addition agents, such as anti-oxidants, dyes, etc.

The proportions of the various ingredients used in this invention are quite flexible and may be varied at will, according to the particular properties desired in the finished product. Ordinarily, however, the soluble oil will contain about 80-95% of the mineral or fatty oil base, from 5-10% of mineral oil sulfonates, 0.5-2.0% of an alcohol amine, 0.5 to 3% of carboxylic acid and 0.01 to 5.0% of homogenizer if desired, although it is not intended that the invention should be limited to the above proportions.

For the sake of illustration, a number of examples of the invention are given herewith:

Example 1

	Percent
Oil-soluble sulfonate	7.0
Triethanolamine oleate	1.5
Oil	Balance
	100.0

This soluble oil was found to have an emulsifying power equivalent to that of a similar oil containing 14% of oil-soluble sulfonate, but containing no triethanolamine oleate.

Example 2

	Percent
Oil-soluble sulfonate	7.0
Triethanolamine oleate	1.5
Excess (free) triethanolamine	0.2
Oil (mineral white oil called Marcol)	Balance
	100.0

This soluble oil was found to produce emulsions which were even more stable than those produced in Example 1.

Example 3

About .03% of water was thoroughly mixed into the soluble oil prepared in Example 2. The product was uniform and showed no tendency to gel.

Example 4

	Percent
Sulfonated lard oil	20
Triethanolamine oleate	2
Oil	Balance
	100

Soluble oils prepared according to this invention may be used for any known uses, such as wool oils or other textile oils, for making cutting oils and as a stock solution for preparing emulsions by dilution or addition of water.

It is not intended that the invention be limited by any of the examples given, nor by any theories suggested for the operation of the invention, but only by the appended claims in which it is

intended to claim all novelty inherent in the invention as broadly as the prior art permits.

We claim:

1. A non-gelling emulsifiable textile oil composition consisting of at least 80% of a mineral oil, an oil soluble sulfonate emulsifier, a lower aliphatic alcohol amine having less than 7 carbon atoms, and a carboxylic acid having more than 6 carbon atoms.

2. Composition according to claim 1 in which the amine is triethanolamine and the acid is oleic acid.

3. Composition according to claim 1 in which the acid is a fatty acid having more than 12 carbon atoms.

4. Composition according to claim 1 in which the amine is present in quantity slightly more than sufficient to combine with the carboxylic acid.

5. A non-gelling emulsifiable textile oil composition consisting of at least 80% of a mineral oil, an oil-soluble sulfonate emulsifier, a fatty acid having more than 6 carbon atoms and triethanolamine, the amount of the latter being slightly in excess of the stoichiometric amount required to combine with the fatty acid.

6. A non-gelling emulsifiable textile oil composition consisting of 85 to 95% of a mineral oil, 5 to 10% of the sodium soaps of oil-soluble sulfonic acids derived from treatment of petroleum lubricating oil with strong sulfuric acid, 0.1 to 2% of a lower aliphatic alcohol amine having less than 7 carbon atoms and 0.1 to 5% of a fatty acid having more than 6 carbon atoms, the amount of the alcohol amine being at least the stoichiometric amount required to combine with the fatty acid.

7. A non-gelling emulsifiable textile oil composition consisting essentially of a mineral oil, about 7% of oil-soluble sulfonate emulsifier derived from petroleum hydrocarbons and about 1.5% of triethanolamine oleate.

8. A non-gelling emulsifiable textile oil composition consisting essentially of a mineral oil, about 7% of oil-soluble sulfonate emulsifier derived from petroleum hydrocarbons, about 1.5% of triethanolamine oleate and about 0.2% of free triethanolamine.

9. An emulsion comprising a major proportion of water and a minor proportion of a non-gelling emulsifiable textile oil composition consisting of at least 80% of a mineral oil, oil-soluble sulfonates derived from petroleum hydrocarbons and present in an amount insufficient to maintain a stable emulsion if used as sole emulsifier, a small amount of a carboxylic acid having more than 6 carbon atoms and a lower aliphatic alcohol amine having less than seven carbon atoms.

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