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STABILIZED AMMONIUM MAHOGANY SULFONATES

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This invention relates to mineral oil compositions and, more particularly, to improvements in compositions consisting essentially of such mineral oil fractions containing a minor proportion of ammonium mahogany sulfonate.

Effective rust-inhibiting mineral oil compositions have previously been prepared by incorporating in a mineral oil fraction a minor proportion of a petroleum ammonium sulfonate, obtained by the reacting of ammonia with a sulfuric acid-treated hydrocarbon oil, i. e. by the amination of mahogany acids. Rust-inhibiting, lubricating, slushing and needle oils, and the like, may be compounded by blending concentrates so prepared with a suitable base oil.

It has been found, however, that, while the compounding of the sulfonates with the mineral oil fraction effectively retards rusting, the concentrate of the sulfonate in the mineral oil, for instance a 10% concentrate of ammonium mahogany sulfonate in neutral oil, is not completely stable over periods of prolonged storage. It has been observed that, on long standing, a yellowish-white gelatinous precipitate frequently forms in the composition, causing turbidity. Further, upon formation of this precipitate, the rust-inhibiting properties of the composition are somewhat impaired.

We have found that the formation of this precipitate may be prevented and the composition made to remain clear and homogeneous over long periods of time by including in the mineral oil composition, containing the ammonium mahogany sulfonates, a minor proportion of an oil-soluble alcohol. Alcohols suitable for this purpose are those containing three or more carbon atoms per molecule and may be either aliphatic or aromatic in nature. For instance, alcohols of the aliphatic type, which have been used effectively, included amyl alcohol, isopropyl alcohol and lauryl alcohol. Alcohols of the aromatic type which have been effectively used include the oil-soluble phenylic alcohols, oil soluble alkylated phenols, for instance, di-amyl phenol. The monobenzyl ether of ethylene glycol is a further example of an alcohol which has been found highly effective for this purpose.

We have found that where a minor proportion of an alcohol of the type described is included in the oil concentrate, formation of the precipitate does not occur. Even after the formation of the precipitate in the mineral oil composition, the composition may be clarified, the precipitate being completely dissolved, by the addition of 1 to 2% by volume of isopropyl alcohol for instance and, thereafter, the composition has been found to remain clear and bright over periods of storage at room temperature in excess of 200 days and to remain entirely free of haze after it has been brought back to room temperature following a chilling to 0° F.

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In further tests, 2% by volume of amyl alcohol, lauryl alcohol, di-amyl phenol and the monobenzyl ether of ethylene glycol, respectively, were added to separate samples of an oil composition, consisting of acid treated 210 neutral oil containing 10% by volume of ammonium mahogany sulfonate which, upon standing, had developed considerable turbidity. Before taking the samples, the precipitate was evenly suspended in the oil by agitation. Upon adding the alcohol, the respective samples completely cleared and remained clear after a storage period of over two months. A blank sample of the oil composition, originally turbid, remained turbid over the test period. Further, the rust-inhibiting characteristics of the mineral oil composition were not deleteriously affected by the addition of the alcohol.

In a further series of tests, 1% by volume of amyl alcohol, di-amyl phenol, lauryl alcohol and the monobenzyl ether of ethylene glycol, respectively, were added to separate samples of a freshly prepared concentrate consisting of approximately 10% by volume of ammonium mahogany sulfonate in acid treated 210 neutral stock. A sample of the stock to which no alcohol was added became turbid and developed a precipitate in 13 days, whereas each of the samples to which the respective alcohols were added, remained clear and developed no precipitate after a storage period at room temperature in excess of two months.

The improved concentrates are useful for preparing mineral oil blends whether the mineral oil constituent is of the lubricating, gasoline, kerosene, Diesel fuel, fuel oil, or slushing or needle oil type. The proportion of alcohol added may, with advantage, vary from as low as 0.1 to 2% by volume. The optimum proportion of alcohol to be used will depend somewhat upon the characteristics of the particular mineral oil fraction and the proportion of the sulfonate incorporated therein. A concentrate which has been found particularly advantageous, both with respect to rust-inhibiting characteristics and stability, is one containing 88% of Mid-Continent neutral, 10% ammonium mahogany sulfonate, and 2% of the alcohol, each by volume. The proportion of the sulfonate in the concentrate is subject to

variation and the proportion of the alcohol may with advantage be varied within the above indicated range.

A particularly desirable lubricating oil composition may be prepared by blending the above described concentrate with a suitable lubricating oil fraction in such proportions that the lubricating oil blend contains about 0.05 to about 1% by volume of the ammonium mahogany sulfonate.

Ammonium mahogany sulfonates which have been used, with advantage, in the preparation of our improved mineral oil composition, are those described in the copending application of Franklin M. Watkins, Ser. No. 638,581, filed December 31, 1945, now abandoned.

We claim:

1. A mineral oil composition consisting essentially of a neutral oil solution of ammonium mahogany sulfonate containing 10% by volume of ammonium mahogany sulfonate and which has been stabilized against the formation of a precipitate on storage by the addition of 0.1% to 2% by volume of an oil soluble alcohol containing not less than three carbon atoms per molecule.

2. A mineral oil composition consisting essentially of a neutral oil solution of ammonium mahogany sulfonate containing 10% by volume of ammonium mahogany sulfonate and which has been stabilized against the formation of a precipitate on storage by the addition of 0.1% to 2% by volume of isopropyl alcohol.

3. A mineral oil composition consisting essentially of a neutral oil solution of ammonium mahogany sulfonate containing 10% by volume of ammonium mahogany sulfonate and which has been stabilized against the formation of a precipitate on storage by the addition of 0.1% to 2% by volume of amyl alcohol.

4. A mineral oil composition consisting essentially of a neutral oil solution of ammonium mahogany sulfonate containing 10% by volume of ammonium mahogany sulfonate and which has been stabilized against the formation of a precipitate on storage by the addition of 0.1% to 2% by volume of lauryl alcohol.

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