

UNITED STATES PATENT OFFICE

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MINERAL-OIL AMINO SULPHONATES

No Drawing.

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This invention relates to a new composition of matter. This new composition of matter comprises a complex molecule consisting of a plurality of organic radicals possessed of dissimilar physical affinities for other substances.

This new composition of matter, therefore, has the primary characteristics of effecting or accelerating the physical or chemical association of other substances slow, difficult or impossible to associate by themselves. For instance, one of the characteristic properties of this new composition of matter is its excellence as a detergent. This new composition of matter is the reaction product of mineral oil sulphonic acid and stable amines such as the mono, di or tri alkyl and/or aryl hydroxy amines.

In view of the fact that the chemical formula for the mineral oil sulphonic acids has never been satisfactorily demonstrated a minute description of these products is offered.

These sulphonic acids are formed by treating certain oils with sulphuric acid. These oils include those hydrocarbon oils characterized by the presence of certain components susceptible to modification by the action of sulphuric acid and certain components not susceptible. Oils such as petroleum, shale oil and coal tar oil, gilsonitic distillates and many other fractions or distillates of mineral oils or hydrocarbon deposits usually exemplify this characteristic.

Since petroleum is commercially available at present in large quantities, the following disclosure is made in relation thereto.

When petroleum or fractions thereof, such as lubricating stock, are treated with sulphuric acid, certain components of the oil are modified. The theory chemically accepted at present explains this modification as sulphonation, i. e., the sulphuric acid reacts with components of the mineral oil to form mineral oil sulphonic acids. The yield of sulphonic acids is higher when the oil is treated with fuming sulphuric acid, so this disclosure is also made in relation to this fuming sulphuric acid treatment.

This above described sulphonating treatment is practiced on a large commercial scale

in the refining of medicinal white oil. In this refining operation the sulphonated components are the by-products and are commercially available as such at present. These sulphonated components are usually available in the form of alkaline salts since the sulphonated components in the acid state have a corrosive action on iron or steel pipes or containers and there is an advantage in shipping and handling these sulphonated components in a neutral state.

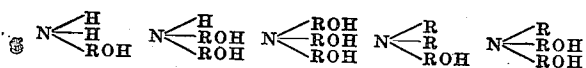
In commercial practice a mineral oil fraction such as a lubricating stock is treated with fuming sulphuric acid. Two layers are formed. The upper layer is known as the A layer or oil layer because of its characteristic oil solubility and the lower layer as the B layer or sludge layer.

The process of refining the white oil and extracting the mineral oil sulphonates of the oil layer, known as mahogany sulphonates, is described and claimed in United States Letters Patent No. 1,087,888 to Grigori Petroff, issued February 17, 1914; United States Letters Patent No. 1,233,700 to Grigori Petroff, issued July 17, 1917; United States Letters Patent No. 1,196,274 to Grigori Petroff, issued August 29, 1916, and a specific process in United States Letters Patent No. 1,286,179 to Robert E. Humphreys, issued November 26, 1918.

Some of the pertinent sulphonic sludge layer acids and salts, and the processes of extracting or making them are described in the patents to Robert E. Divine, namely: No. 1,301,662 of April 22, 1919; No. 1,301,663 of April 22, 1919; No. 1,303,779 of May 13, 1919; No. 1,319,027 of Oct. 14, 1919; No. 1,330,624 of Feb. 10, 1920; No. 1,438,101 of Dec. 5, 1922.

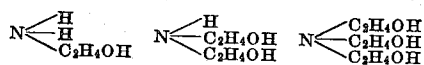
The alkyl and/or aryl hydroxy amines are commercially new products. They are relatively stable liquids and quite water soluble. They comprise the nitrogen atom to which is attached one or more alkyl or aryl groups or radicals containing one or more hydroxyl groups. The other nitrogen variances may be satisfied by hydrogen atoms or by alkyl or aryl groups or radicals which may contain or may be devoid of hydroxyl groups. The

following formulas are given for purpose of illustration and to identify the members of this general class:



in which R represents an alkyl or aryl group. Some of the members of this class which have been used with the sulphonic acids to advantage are the mono, di and tri ethanol amines.

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In practicing this invention a quantity of the mineral oil sulphonic acid from either layer or both is taken and mixed with a predetermined quantity of the hydroxy amines, said quantities being determined in relation to the molecular weights to permit complete reaction of all sulphonic acids and hydroxy amines.

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Since the molecular weights of the sulphonic acids varies with the individual batch according to the refining and purifying process and the oil treated, and since a given batch of hydroxy amines usually contains several members of the class in variable proportions according to the process of manufacture it is requisite to determine the characteristics of each batch of components in order to calculate the correct combining weights.

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The general process of making this new composition of matter is to simply thoroughly mix the hydroxy amines and the sulphonic acid usually reconstituted from the sodium salt by treatment with a mineral acid, in a mixing vessel in the presence of sufficient heat to render the sulphonic acid readily mixable, an appropriate temperature being 80° F. The resulting product is quite unusual in that there is combined in one molecule an amino radical more stable, more water soluble and more penetrating than ammonia, the sulphonic group usually indicative of water solubility or water affinity and an oil radical of high molecular weight and complex structure possessed of an affinity for oils, grease, fats, waxes, etc., said oil radical also having an affinity for or a tendency to form absorption compounds with colloidal substances such as rubber, gelatine, glue, starch, etc. This new composition of matter is highly soluble in oil, water, alcohol, ketones, as well as in others.

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This mineral oil sulpho amine is recommended for use as a surface tension depression in breaking emulsions as a soap, and also as an emulsifier in making emulsions of water with oils, fats, greases, waxes and the like.

Having described my invention, I claim:

1. A new composition of matter comprising the reaction product of mineral oil sulphonic acid and a hydroxy amine.

2. A new composition of matter, comprising, an amine combined chemically with a member of the mineral oil sulphonic acid

group of the type produced in the refining of medicinal white oils and the like.

3. A new composition of matter, comprising, a chemical combination of a water soluble hydroxy amine and an oil soluble member of the mineral oil sulphonic acid group.

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4. A new composition of matter, comprising, a reaction product of a member of the mineral oil sulphonic acid group and a member of the group consisting of mono, di and tri ethanol amine.

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5. A new composition of matter comprising the reaction product of mahogany sulphonic acid and an ethanol amine.

6. A new composition of matter, comprising, tri-ethanol amine and mineral oil sulphonic acid chemically combined.

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7. A detergent, comprising, an oil soluble mineral oil sulphonic acid chemically combined with a stable water soluble amine.

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8. A new composition of matter, comprising, a reaction product of a member of the mineral oil sulphonic acid group and a stable water soluble amine.

In witness whereof, I hereunto subscribe my name.

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WARREN T. REDDISH.

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