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HIGHER ALKYL HYDROXY-AMINES

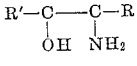
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5 Claims. (Cl. 260—584)

This invention relates to oil blending agents and relates especially to the preparation of improved oil soluble aliphatic hydroxy amines, which materials are excellent as addition agents to lubricants and other oils in order to improve their stability and other properties. The application is a continuation in part of my application No. 746,981, filed October 5, 1934, entitled "Oil blending agent."

The invention particularly relates to the process of preparing primary hydroxy amines of high molecular weight which contain the hydroxy and amino group, preferably on adjacent carbon atoms, as exemplified by the following formula:



in which R and R' may represent any organic radical as, for example, alkyl, aryl, aralkyl, or one of these radicals may represent hydrogen.

The invention is also concerned with the economic preparation of aliphatic hydroxy amino compounds from particular types of feed material, as, for example, from high molecular weight unsaturated aliphatic petroleum compounds from cracked petroleum wax or from paraffin wax, crude scale wax, slack wax, petrolatum wax, or from solvent extracts of cracked petroleum fractions or similar raw materials. These classes of feed materials give high yields of superior quality products. Especially desirable primary hydroxy amine compounds are those in which the hydroxy and amino group are attached to adjacent carbon atoms, which carbon atoms are at or near the end of the aliphatic chain.

The blending agents of the present application are secured by dehydrogenating or cracking substantially aliphatic materials, preferably aliphatic petroleum materials having from 5 to 30 carbon atoms in the molecule. In this application, the term "dehydrogenation" will be construed to include cracking as well as any other methods of producing unsaturation. The preferred initial materials are those olefines having from 7 to 15 carbon atoms in the molecule, preferably cracked paraffin wax olefines boiling in the range from about 200 to 700° F.

These petroleum aliphatic feed materials may be rendered unsaturated by any suitable method. It is, however, preferred to subject the materials to cracking conditions at temperatures from about 700 to 1100° F. In the case of wax, liquid phase cracking at about 750° F. to 850° F. and atmospheric pressure is preferred. These materials, however, may also be rendered unsaturated by cracking at higher temperatures in the vapor phase, with or without use of elevated pressure (10–100 atmospheres).

The cracked product in the crude state, or purified by solvent extraction, treating, or other means, is then converted to the corresponding halohydrin by reacting with reagents such as hypochlorous acid, urea halide, or similar reagent. The entire cracked product may be treated with the halohydrin forming agent or it may be desirable to distill the cracked product and select a particular suitable boiling range for treatment. The cracked unsaturated materials may be separated by solvent extracting with suitable solvents as, for example, sulphur dioxide, phenols, dichlorethyl ether, alcohol, furfural, and the like.

The preferred process of the present invention is to utilize relatively long chain alpha olefines. The preferred process of preparing these materials which give oil soluble stable products is to crack petroleum wax in the liquid phase at temperatures in the range of from 700 to 800° F., and preferably at pressures from 0 to 25 pounds gauge. This process yields an unsaturated product rich in long chain alpha olefines.

This entire cracked distillate rich in alpha olefines, or a segregated fraction thereof boiling in the range from about 200 to 700° F., is treated with a suitable reagent to form a halohydrin. Preferred reagents are hypochlorous acid and urea chloride. It may be preferable to segregate a particular boiling range of the cracked distillate prior to forming the halohydrin. The halohydrin is then converted to the hydroxy amine by any suitable method as, for example, by refluxing with aqueous ammonia or by heating at a temperature from about 120° F. to 400° F., under 3 to 50 or more atmospheres pressure with anhydrous ammonia.

This reaction product may be purified and/or concentrated by any of the well-known methods of the art as, for example, by extraction with alcohol, distillation, etc.

The invention may be more clearly understood by reference to the following example, which is presented for the purpose of illustration and is not to be construed as limiting the invention in any manner whatsoever.

Example

A petroleum paraffin wax containing paraffin hydrocarbons having from 10 to 35 carbon atoms per molecule, averaging about 24 carbon atoms, was cracked in the liquid phase at a temperature

of about 750° F. under a pressure of about 50 pounds. The cracked distillate was then distilled and the fraction boiling in the range from about 500° F. to 1,000° F. was segregated. This material had an unsaturated content of about 50 to 60%.

This cracked wax fraction was then treated with urea chloride at approximately room temperature with vigorous stirring. The chlorinated product was then treated with anhydrous ammonia at about 120° F. under pressure. The hydroxy amines were recovered from the reaction mixture through their hydrochlorides and a yield of 10% based on the cracked wax was obtained. These amines showed, upon analysis, 1.69% nitrogen and 0.34% chlorine. 0.2% of these amines in a hydrogenated S. A. E. 50 oil considerably reduced the oxygen absorption rate at about 400° F. It is possible to obtain a chlorine-free product, if desired.

The above invention is not to be limited by any theory or mode of operation but only by the following claims in which it is desired to claim all novelty in so far as the prior art permits.

I claim:

1. A hydrocarbon oil soluble mixture of higher primary aliphatic hydroxy amines in which the hydroxy group and the amino group of each molecule have been added to the double bond carbon atoms of olefines in a distillate boiling in the range of 200° to 700° F. prepared by cracking higher boiling paraffinic hydrocarbons of a petroleum source.

2. A product according to claim 1, in which said distillate is rich in alpha olefines having 7 to 15 carbon atoms per molecule and said paraffinic hydrocarbons are in a petroleum wax.

3. Process for preparing a hydrocarbon oil soluble mixture of primary aliphatic hydroxy amines, which comprises cracking petroleum wax at a temperature in the range of 700° to 1100° F., distilling the resulting cracked products to form a distillate boiling in the range from about 200° to 700° F., converting olefines in said distillate into halohydrins, and reacting said halohydrins with ammonia to form the mixture of aliphatic hydroxy amines.

4. Product secured by the process of claim 3.

5. Process for preparing a hydrocarbon oil soluble mixture of primary aliphatic hydroxy amines, which comprises cracking petroleum wax in the liquid phase at a temperature in the range of about 700° to about 800° F., distilling the resulting cracked products to form a distillate containing alpha olefines having 7 to 15 carbon atoms per molecule, treating said distillate with urea chloride to convert the olefine components of said distillate into chlorhydrins, and reacting the mixed chlorhydrins with ammonia to form the mixture of primary aliphatic hydroxy amines.

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