

UNITED STATES PATENT OFFICE

2,049,043

SOLUBLE OILS

Harold S. Birkby, Nutley, N. J., assignor to
Standard-I. G. Company, a corporation of
Delaware

No Drawing. Application May 11, 1934,
Serial No. 725,083

11 Claims. (Cl. 87—9)

This invention relates to the manufacture of "soluble" petroleum oils and emulsions formed from such oils. It relates particularly to the manufacture of compositions containing hydrogenated lubricating oils that are readily emulsifiable.

It is known that hydrocarbon distillates, such as those obtained from petroleum, may be reformed by destructive, catalytic hydrogenation at elevated temperatures and pressures to produce products essentially different from those produced by simple hydrogenation or by destructive hydrogenation at lower temperatures. These products reformed by destructive, catalytic hydrogenation may be produced from hydrocarbon oil distillates of various boiling ranges including that of a heavy lubricating oil having a viscosity of 98 seconds at 210° F. and light lubricating oil having a viscosity of about 52 seconds at 210° F.

This invention is not limited to any particular type of hydrogenation. However, in the preferred process these distillate oils, or the like, are passed with free hydrogen over suitable catalysts at a pressure of about 3500 lbs. per square inch and at a temperature of above about 750° F. with a suitable partial pressure of hydrogen and time of contact to secure a destructive hydrogenation without the formation of appreciable amounts of polymerized or coky material. The hydrogen supplied is preferably within the range of about 10,000 cu. ft. per barrel of fat oil, the amount generally depending upon the gravity and boiling range of the charging stock. A greater proportion of hydrogen may be used with suitable variation in feed rate, pressure and temperature as is known in the art. The feed rate depends on the reaction temperature and other operating conditions, such as the partial pressure of hydrogen, and may be suitably about 0.3 volume of oil per 0.6 volume of catalyst filled reaction space per hour. The catalysts comprise the oxides or sulfides of the VI group of elements with suitable promoters of the alkaline earth oxides. Such catalysts are not sensitive to sulfur poisoning and are suitably classified as active in the presence of sulfur.

The product of such a destructive hydrogenation process, especially of mineral oils containing appreciable amounts of naphthenic hydrocarbons, possesses the highly desirable property of being readily emulsifiable when used in combination with suitable compounds such as ethanolamines, ethylene glycols, etc., and with the soaps therefrom, more particularly with the soaps such as are known as petroleum sulfonates, these sul-

fonates being more or less purified and oil-free than otherwise. Other petroleum oils, fatty oils, oil waxes, vegetable oils (blown or otherwise) may be included. The most desirable oil fraction is usually that having a viscosity of about 5 95 to 98 seconds at 100° F.

The emulsifiability of the oils reformed by destructive, catalytic hydrogenation depends not only upon the operating conditions used in the destructive hydrogenation process but also upon 10 the source of the hydrocarbon oils used as feed stock. Operating conditions in the destructive hydrogenation process being equal, oils reformed by destructive, catalytic hydrogenation for the present invention are preferably produced from 15 mineral oils containing appreciable amounts of naphthenic hydrocarbons such as, for example, Colombian mineral oils and Pecos mineral oils. Mineral oils prepared by destructive hydrogenation under the operating conditions defined above, 20 from mineral oils containing appreciable amounts of naphthenic hydrocarbons, are far superior in emulsifiability to the corresponding straight run distillates from the same crudes. In addition, the oils reformed by destructive, catalytic hy- 25 drogenation are desulfurized during the destructive hydrogenation process and the sulfur content of even high sulfur oils is reduced below that at which bad effects on lead pigments and the like are noticed. 30

The selected oil fraction is preferably freed of wax and mixed with a suitable amount of an emulsifier, for example, about 5% by weight of an emulsifier such as a purified oil-soluble sulfonate, and upon mixing with water will readily 35 form an emulsion. The character and quantity of the emulsifier will vary with the intended purpose and with the base stock. Any suitable emulsifier can be used so far as the present invention is concerned, for that rests principally on the 40 discovery of the unexpected emulsifying qualities of hydrogenated oils.

The soluble mineral oil compositions prepared by the present method are especially suitable for 45 use in treating textiles in any state or stage of manufacture, from the raw stock to finished goods inclusive, of natural and synthetic materials, for example, in the manipulation of fibers (natural or synthetic), whether loose or in various forms of yarn manufacture, fabric manufacture or the 50 finishing of fabrics. Fibers that may be so treated are wool, hair, cotton, silk, flax, jute, ramie, any or all bast fibers, and synthetic materials which may be classed as rayons. The mineral oils reformed by destructive, catalytic hydrogenation- 55

tion together with an emulsifier may be used in scouring, fulling, winding, throwing, boiling (pressure or open), soaking, wetting out, dyeing, impregnating, waterproofing, printing and finishing. The oils reformed by destructive, catalytic hydrogenation together with an emulsifier may also be used as machinery lubricants, especially where contamination of materials passing through a machine may be a factor and removal of the lubricant is desirable. Other uses of this solvent oil are as mold dressings, plasticizing agents, and for treatment of latex in the rubber industry, in preparing paper boards and the like, in cutting oils, oxidation inhibitors, rust preventatives, etc. in reference to metal. It is also suitable in coal sprays, vegetation killers, insecticides, horticultural spraying, animal dips, ointments, creams, polishes, inks, wetting agents, etc. For example, a composition of the following ingredients substantially in about the proportions by weight stated is satisfactory:

	Per cent
Triethanolamine oleate.....	2.5
Oil-soluble sulfonates.....	7.5
Mineral oil reformed by destructive, catalytic hydrogenation.....	90.0
	100.0

This oil composition readily emulsifies when mixed with water (one part of oil to two parts of water) and agitated. The resulting emulsion is white in color and can then be sprayed on loose wool fibers, according to the accepted woolen mill practice, previous to picking and carding operations.

The foregoing description is merely illustrative and various changes and alternative arrangements may be made within the scope of the appended claims in which it is my intention to claim all inherent novelty in the invention as broadly as the prior art permits.

I claim:

1. A readily emulsifiable composition comprising an emulsifier and a mineral oil reformed and substantially desulfurized by destructive, catalytic hydrogenation.

2. Composition according to claim 1, in which the mineral oil is one of the naphthenic base type.

3. A water-soluble lubricating composition comprising an emulsifier incorporated with a major proportion of a naphthenic base mineral oil reformed by destructive, catalytic hydrogenation.

4. Composition according to claim 3, in which the mineral oil is Colombia or Pecos crude.

5. A composition comprising an emulsifier and a mineral oil reformed by destructive, catalytic hydrogenation and containing appreciable amounts of naphthenic hydrocarbons.

6. Composition according to claim 5, in which a mineral lubricating oil is reformed.

7. A composition comprising an emulsifier and a low cold test mineral oil reformed by destructive, catalytic hydrogenation and containing appreciable amounts of naphthenic hydrocarbons.

8. A composition comprising a mineral lubricating oil reformed by destructive, catalytic hydrogenation, containing appreciable amounts of naphthenic hydrocarbons, and emulsifying sulfonates formed by the acid treatment of hydrocarbons.

9. An emulsified lubricating composition comprising a minor proportion of a mineral oil reformed by destructive, catalytic hydrogenation, and containing naphthenic hydrocarbons, an emulsifier incorporated therewith and a major proportion of water.

10. Composition according to claim 9, in which the emulsifier is a vegetable oil soap.

11. Composition according to claim 9, comprising fatty oil, and a soap of a fatty oil as emulsifier.

HAROLD S. BIRKBY.