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MINERAL OIL COMPOSITION

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1 Claim. (Cl. 87—9)

This invention relates to mineral oils such as are used as lubricants or in electric transformers, under conditions which tend to cause oxidation through contact with atmospheric oxygen. Such conditions arise either from high temperature in the oil, or from long-continued use at moderate temperatures. In either case, oxidation results in deterioration, due to the formation of acid and of solid precipitates or sludge.

It is well known that the chemical treatment used in the production of highly refined oil brings about a condition in which the oil is particularly sensitive to oxidation and the formation of acid, usually with an accompanying sludge formation. Similar tendencies may exist in oils, such as synthetic or hydrogenated oils, which have not been highly refined, in the usual sense of the term.

The object of the invention is to produce oils having the desirable qualities of highly refined oils, or of other oils which are normally liable to ready oxidation, but in which the formation of acid and sludge is substantially reduced or retarded. In evaluating highly refined oil it is common to use a test known as the Snyder life test, in which the oil, maintained at a temperature of 120° centigrade, is exposed to atmospheric air constantly refreshed. Samples are examined daily, and the quality of the oil is judged by the number of days before the first appearance of sludge, and by the rate of acid formation. It is a particular object of this invention to produce oils which will rate high in accordance with this test, and give good service under the conditions of actual use of which the test is an accelerated representation.

It is well known that certain materials, added in small quantities to a highly refined oil, have a tendency to inhibit or to retard the oxidation of the oil. The present invention is based on the discovery that by the combined use of two stabilizing agents, selected from two particular classes of substances, the useful life of the oil may be improved with respect to both acid formation and the first occurrence of sludge, in a manner and to a degree which cannot be realized with any quantity of either agent alone. The stabilizing materials which we have found useful for the purpose in question are, on the one hand, an organic disulphide, specifically dibenzyl disulphide, and on the other hand, the aromatic hydroxy compound beta naphthol. The amounts to be used are not critical, but it has been found that there is little advantage in exceeding the amounts, of beta naphthol and dibenzyl disulphide, of .10% and .05%, respectively, of the weight of the oil. Useful results may be attained with much smaller quantities.

As an example of the utility of the invention, we have found that an ordinary transformer oil showed, under the Snyder life test, first sludge in 21 days. With the addition of either betal naphthol or dibenzyl disulphide alone, in various quantities up to .20%, there was no definite change in this respect, although acid formation was retarded by the dibenzyl disulphide. With the addition of .10% beta naphthol and .05% of dibenzyl disulphide, however, the development of sludge was inhibited for 42 days, while the acid formed in the same time was reduced to a negligibly small quantity.

The invention claimed is:

The combination, with a mineral oil susceptible to atmospheric oxidation, of a relatively small quantity of a stabilizer comprising beta naphthol and dibenzyl disulphide.

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