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NONSLUDGING OIL AND METHOD OF MAKING THE SAME

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The present invention relates to the improvement in mineral oil products, including oils, greases and the like, and will be fully understood from the following description.

Hydrocarbon oils, waxes and the like are often subjected to high temperatures and to the action of air or other oxidizing agents, and under such conditions deterioration is often very rapid. The deterioration is evident from a darkening in color and the formation of a sediment or sludge which is insoluble and settles from the oil.

We have found that the addition of certain metallo-organic substances, of which tetraethyl lead is typical, will greatly reduce the tendency toward sludge formation and darkening in color, even if the metallo-organic compound be present in a very small quantity.

Our invention may be applied to hydrocarbon oils, waxes, or greases of any source, but particularly to petroleum cuts or fractions which are used for so-called non-sludging or sludge-resistant oils. It is advantageous in the compounding of transformer oils, switch oils, or oils for any insulating purpose. It is also useful for high grade non-sludging lubricants, such as turbine oil. Greases such as petrolatum can be similarly treated advantageously.

In compounding oils, according to our invention, the oil is selected according to the physical properties, chiefly viscosity and flash, which are desirable for the particular service. For example, a transformer oil will be selected with properties falling within the following limits: Bé. 30° to 38°, flash above 270° F., viscosity 70 to 120 seconds Saybolt at 100° F. To this oil the metallo-organic compound, for example, lead tetraethyl, is added in quantity from .01 to 1.00% by weight.

The properties of turbine oils fall within the following range: Bé. 21° to 28°, flash above 300° F., viscosity 120 to 550 seconds Saybolt at 100° F. As an example, .01 to 1.0% of tetraphenyl lead is added. Other lubricants may have a viscosity above 550 seconds Saybolt at 100° F.

Various metallo-organic compounds have been found which are considered the equivalent of lead tetraethyl, and the following are specifically named to clearly indicate the class, namely, lead tetraphenyl, lead triethyl bromide, lead triethyl acetate, tin tetraethyl and tin triethyl bromide. In the claims we have used the term "metal of the second subgroup of the fourth periodic group" as generic to metals which may be used in our method.

In compounding the metallo-organic agents with oils or waxes, the hydrocarbon oil may be heated to aid in solution and the non-sludging agent thoroughly incorporated preferably by mechanical agitation.

No theory or explanation of the action of these non-sludging agents is offered, and although the generally accepted opinion seems to be that sludge is caused by oxidation, we do not wish to limit our invention to anti-oxidation catalysts. The examples given are to be considered merely as illustrations, and we wish to limit our invention only by the following claims wherein we intend to claim all novelty inherent in our invention.

We claim:

1. A sludge-resistant hydrocarbon oil heavier than kerosene and containing an alkyl compound of a metal selected from the group consisting of lead and tin.

2. A sludge-resistant hydrocarbon oil heavier than kerosene and containing an alkyl compound of lead.

3. A sludge-resisting oil consisting of a hydrocarbon oil having a viscosity above 70 seconds Saybolt at 100° F. and containing between .01 and 1.0% of tetraethyl lead.

4. A sludge-resistant oil according to claim 3 in which the hydrocarbon oil has a vis-

cosity between 70 and 550 seconds Saybolt at 100° F.

5. A sludge-resistant hydrocarbon oil heavier than kerosene and containing tetraethyl lead.

6. Composition according to claim 5, in which 0.01 to 1.0% of tetraethyl lead is present.

7. Process of manufacturing a sludge-resistant hydrocarbon oil composition, comprising incorporation tetraethyl lead with a suitable hydrocarbon oil heavier than kerosene.

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