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SULPHURIZED LUBRICANT

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5 Claims. (Cl. 87-9)

This invention relates to improvements in sulphurized lubricating oil compositions and has to do particularly with the manufacture of stable sulphurized lubricants adapted for use as cutting oils and extreme pressure lubricants.

In accordance with the invention, an aromatic compound of condensed ring nucleus is treated with sulfur to form a sulphur base and the resulting product is then incorporated into a lubricating oil. I prefer to use a hydrocarbon of condensed aromatic ring nucleus, such as naphthalene, anthracene, although other multiple ring compounds, such as diphenyl and diphenyl oxide or mixtures thereof, may be used. A sulphur base is prepared by heating the aromatic compound and sulphur to sufficiently high temperature to effect chemical combination as distinguished from mere solution, and temperatures around 400-450° F. are usually necessary although somewhat lower or somewhat higher temperatures may often be desirable. It is also advantageous to use a superatmospheric pressure of the order of 25 to 100 pounds, preferably around 50 pounds per square inch.

The following example is given as an illustration of one method of operation: three parts by weight of naphthalene and one part of sulphur were placed in a pressure vessel and heated for three hours at about 420-440° F., the maximum temperature was around 465° F. and the minimum temperature around 350° F.; pressure was maintained at about 10-35 pounds with an average around 25 pounds. The product was a grayish colored crystalline solid which melts at a relatively low temperature.

The product prepared, as described above, was admixed with 500 viscosity pale oil to form a 5% solution of a sulphur base and oil. The tests on the oil before and after the addition of the sulphur base, were as follows:

Tests	Pale oil	Pale oil+5% sulphur base
Viscosity Saybolt Universal at 100° F.	530	365
Viscosity kinematic at 100° F.		80
Viscosity Saybolt Universal at 210° F.	52.5	48.4
Viscosity kinematic at 210° F.		6.9
Gravity ° A. P. I.	19.1	
Percent sulphur	0.37	1.65
Extreme pressure test	18 pounds	150 pounds

The sulphur base may also be dissolved in a light pale oil of about 80-100 viscosity at 100° F. in sufficient amount to give the oil a sulphur content of about 1-5% to produce a satisfactory cutting oil.

An advantage of the sulphurized lubricants prepared in accordance with the present invention, is that they are highly stable, of good color and precipitate little sludge or sulphur on standing. This stability is believed to be due to the chemical combination of the sulphur and aromatic compound.

Instead of lubricating oils of the viscosity recited above, it is to be understood that oils of any viscosity suitable for use as cutting oils and extreme pressure lubricants come within the scope of the invention. Also any desired amounts of the sulphur base may be admixed with the lubricating oil to give a sulphur content which is well known or preferred in the art for such products; for example, in the case of extreme pressure gear lubricants, heavy oils in the neighborhood of 100-200 Saybolt Universal viscosity at 210° F., may be used.

The extreme pressure test referred to above was made on a special machine and consisted essentially in the measurement of the breakdown of the film of oil between the surface of a steel ball and a steel ring when the ball is travelling at the rate of about 600 feet per minute.

Obviously many modifications and variations of the above invention may be made without departing from the spirit and scope thereof and only such limitations should be imposed as are indicated in the appended claims.

I claim:

1. A lubricant comprising lubricating oil and the product obtained by reacting a hydrocarbon of condensed aromatic ring nucleus with sulphur at temperatures of about 400 to 450° F. for sufficient time to effect chemical combination between said hydrocarbon and the sulphur, said product being present in sufficient amount to give the lubricant a sulphur content of about 1 to 5%.

2. A lubricant comprising a petroleum lubricating oil and sulphurized naphthalene, said sulphurized naphthalene, resulting from the reaction of naphthalene with sulphur at temperatures of about 400 to 450° F. for sufficient time to effect chemical combination between the naphthalene and sulphur, and being present in sufficient amount to give the oil a sulphur content of about 1 to 5%.

3. A lubricating oil composition of the class of cutting oils and gear lubricants, comprising about 95% of lubricating oil and about 5% of a sulphur base formed by heating about three parts of naphthalene and about one part of sulphur at temperatures of about 420 to 440° F. for sufficient

time to effect chemical combination between the naphthalene and sulphur.

4. In the manufacture of sulphurized lubricants, the improvement which comprises heating sulphur with a compound of condensed aromatic ring nucleus to temperatures of about 400 to 450° F. for sufficient time to effect chemical combination between said compound and sulphur, and then incorporating the resultant sulphur base into a lubricating oil in sufficient amount to give the mixture a sulphur content of about 1 to 5%.

5. In the manufacture of sulfurized lubricants the improvement which comprises forming a sulphur base by heating naphthalene with sulphur at temperatures of about 400 to 450° F. for sufficient time to effect a chemical combination of the naphthalene and sulphur and admixing the resulting product with a lubricating oil in sufficient amount to give the mixture a sulphur content of about 1 to 5%.

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