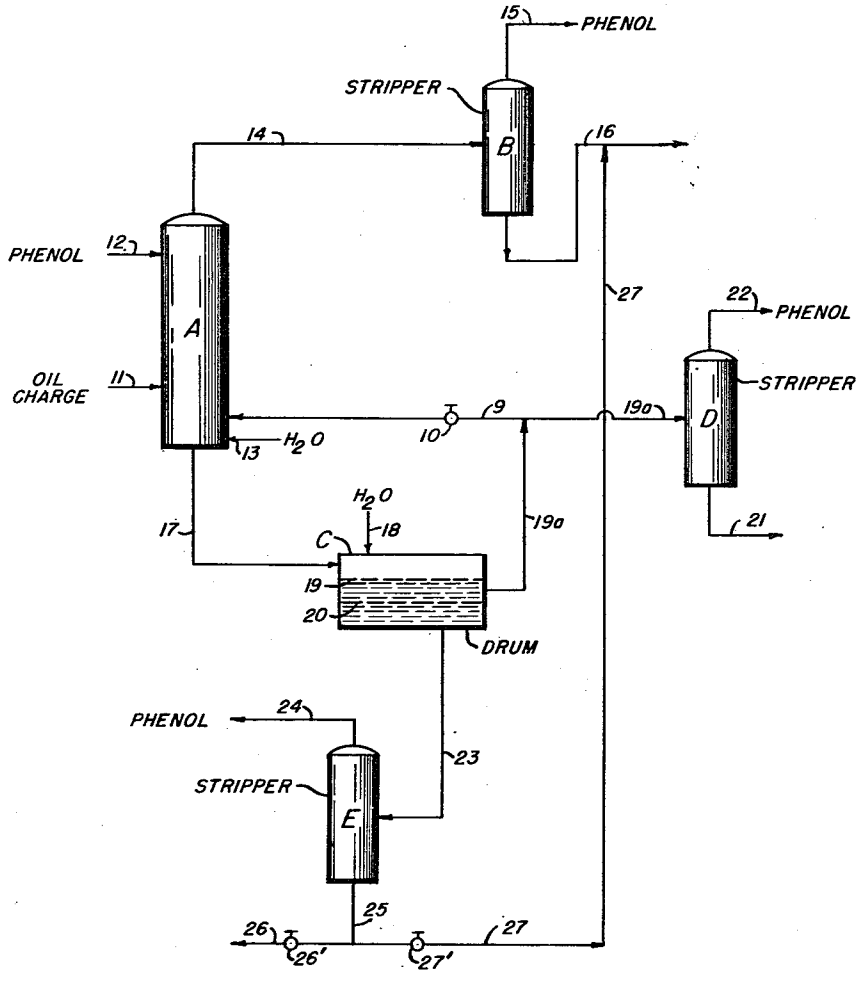
Dec. 4, 1956 H. W. H. MEYER ET AL 2,773,005

METHOD FOR OBTAINING AN OXIDATION INHIBITOR AND AN OXIDATION RESISTANT LUBRICATING OIL

Filed Sept. 17, 1954



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United States Patent Office 2,773,005 Patented Dec. 4, 1956

2,773,005

METHOD FOR OBTAINING AN OXIDATION INHIBITOR AND AN OXIDATION RESISTANT LUBRICATING OIL

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Application September 17, 1954, Serial No. 456,700

2 Claims. (Cl. 196—14.17)

The present invention is directed to a method for securing an oxidation inhibitor and to a method for obtaining an oxidation resistant lubricating oil from a paraffinic light motor oil feed stock derived from crudes such as Panhandle, Ellenberger, or Mid-Continent crudes.

Further objects and advantages of the present invention will be seen from the following description taken in conjuction with the drawing in which the sole figure is in the form of a diagrammatic flow sheet.

The charge stock employed in carrying out the present invention is preferably a Panhandle light motor oil. The characteristics of this stock are well known to the art. The material is a distillate fraction from crude petroleum oil produced from the Panhandle fields. The distillate fraction may boil within the range of 700° to 1000° F. although a heart cut fraction boiling in the range of 800° to 950° F. is preferred. It will be understood that hereafter when a Panhandle light motor oil is mentioned this material is being referred to.

Turning now specifically to the drawing, into countercurrent solvent extraction tower A is passed a Panhandle light motor oil charge stock through inlet line **11**, phenol as the solvent extraction agent through inlet line **12** and water through inlet line **13**. The solvent extraction of light lubricating oils by the use of phenol and water is well known to the art. While the conditions may vary over a substantial range, it may be stated that in general the temperature should be in the range between the melting point of the solvent and the temperature at which complete miscibility occurs. In general, a temperature within the range of 160° to 220° F. will be preferred although a range from 110° to 260° F. may be employed if desired. The quantity of solvent used may also vary over a considerable range but in general it is preferred to use from .5 to 4.0 volumes of solvent per volume of oil.

From solvent extraction tower A a raffinate fraction is removed through outlet line **14** and passed to stripper B where the phenol solvent is removed as overhead through line **15** and the raffinate fraction, which is a desirable lubricating oil, is removed through outlet line **16**.

An extract fraction is removed from solvent extraction tower A by means of outlet line **17** and passes to a separating zone C which may, for example, be a drum. From 3% to 6% water by volume based on the phenol extract is added through inlet line **18** to cause phase separation. Drum C is arranged to allow gravity settling therein so that the phases resulting from the addition of water to the phenol extract settle into layers which in drum C consist of an oil rich layer **19** and a phenol rich (extract) layer **20**.

When the bottom temperature of extract tower A is relatively high, it may be desirable to cool the solvent extract to a temperature within the range of 50 to 100° F. below the bottom temperature of tower A when carrying out the settling step in drum C.

The oil rich layer **19** is fed through line **19***a* to a stripping tower D where oil is withdrawn through line **21**. A phenol fraction is removed in tower D through line **22**.

As an alternative procedure, the oil fraction **19** may be passed through open valve **10** of line **9** as reflux to tower A.

The phenol or extract layer **20** formed in drum C is withdrawn through line **23** and passed to stripper E where it is separated into a phenol fraction removed through line **24** and a finished extract fraction removed through line **25**.

The extract fraction removed from stripper E through line **25** has been found to be particularly effective for use as an oxidation inhibitor for lubricating oils preferably in amounts within the range of about 0.2% to about 5% by volume. A portion is advantageously admixed with the raffinate fraction removed from extract tower A to produce an oxidation resistant lubricating oil. Thus, if desired, the finished extract fraction from line **25** may be removed from the system through line **26** for admixture in a desired lubricating oil or alternatively may be passed through line **27** for admixture with the finished raffinate fraction in line **16**, lines **26** and **27** being provided with valves **26'** and **27'**, respectively, to control the flow of the oxidation inhibiting material as desired.

In order to illustrate further advantages of the present invention, the following example is given:

EXAMPLE

An extract from Panhandle light motor oil was secured by extracting with phenol and water to separate a raffinate fraction and an extract fraction and water then added to the extract fraction to cause phase separation into a phenol fraction and a separate extract fraction in accordance with the procedure described in conjunction with the drawing. A white oil sample was divided into two equal fractions. The first fraction designated A in the table hereafter set out was used as a control while the second fraction, designated as B in the table hereafter had added thereto 1% by volume of the second extract. Samples A and B were both subjected to oxidation by means of a standard test common to manufacturers of lubricating oils. This test is the "Indiana Life Test" and is conducted by bubbling air at a rate of 10 liters/hr. through a 300 vol. sample of oil maintained at a constant temperature of 341° F. After 48 hours the oil sample was withdrawn and tested and the results of the tests were as follows:

Table I

Sample	Amount of Inhibitor, percent	Neut. No. Mg KOH per gram	Viscosity Increase, SSU at 100° F.
A	None	5.33	356
B	1.0	0.064	18

The invention claimed is:

1. A method for obtaining an improved oxidation resistant lubricating oil including the steps of extracting in a first extraction zone in the presence of phenol and water a paraffinic light motor oil distillate to separate it into an extract phase and a raffinate phase, removing said raffinate phase from said first extraction zone and stripping phenol therefrom to recover a motor oil fraction, removing the first extract phase from said first extraction zone, passing it to a separation zone and there adding from 3% to 6% by volume water thereto to cause phase separation therein to form a second extract fraction and a second raffinate fraction, separately removing said second extract fraction and said second raffinate fraction from said separation zone, stripping the phenol from said second extract fraction to recover a finished oxidation inhibitor and admixing at least a portion of said finished

oxidation inhibitor with said motor oil fraction to recover a finished oxidation resistant lubricating oil.

2. A method as recited in claim 1 wherein the portion of oxidation inhibitor admixed with the motor oil fraction is in the range of about 0.2% to about 5% by volume of the motor oil fraction.

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