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STABILIZING HYDROCARBON PRODUCTS

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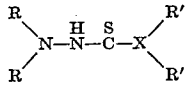
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8 Claims. (Cl. 44—74)

It has been known for some time that certain organic compounds mixed with hydrocarbon products in small amounts result in inhibiting deteriorative changes otherwise prone to occur. For convenience, the term "anti-oxidants" has come into use as designating such agents, although chemists are not in agreement as to the accuracy of the term. However, the effects in view are recognized with sufficient definiteness. We have now found that certain thio derivatives as more particularly detailed below, afford improvements in this direction.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

Hydrocarbon products prone to deteriorative changes, such as motor fuel, kerosene, lubricating and transformer oils, etc., are, in accordance with the invention, compounded with a small amount of an agent from the group consisting of thio compounds of carbazides and semi-carbazides. Illustrative of such are phenylthiosemicarbazide, o-tolyl thiosemicarbazide, diphenylthiocarbazide, diphenylthiosemicarbazide, thiosemicarbazide, etc. Such compounds in general are of the type



wherein R is hydrogen or a hydrocarbon radical, X is NH—N or N, and R′ aryl groups which may contain substituents, as for instance amyl, butyl, etc. groups. Particularly desirable are the 4—4 substituted thiosemicarbazides. The thio compound can be mixed with the hydrocarbon product in amounts up to several per cent. Products so treated show excellent results in usage, storage, etc. Thus, with volatile products such as motor fuel, the thio compound may be used in amounts for instance of 0.0004 to 1 per cent. With oils, such for instance as oils of 45–200 sec. S. U. at 210° F., 0.1 to 1 per cent is satisfactory.

As an example: Phenylthiosemicarbazide is incorporated in a cracked motor fuel at the rate of 0.1 g. per gallon. This product on copper dish gum test shows 2.6 mg. The motor fuel without the thio compound showed 6.2 mg.

As another example: O-tolyl thiosemicarbazide is incorporated at the rate of 0.25 per cent with a commercial S. A. E. 20 lubricating stock. Tested by the test method involving passing thirty liters of air per hour through the oil at 300° F. for sixty-five hours, the product showed viscosity increase 56 sec. Saybolt at 100° F., sludge 0.3 per cent, lacquer 12.4 mg., and appearance rating B minus. The oil without such addition showed a viscosity increase 258, sludge 9.2 per cent, lacquer 54.6 mg., and appearance rating B.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

We therefore particularly point out and distinctly claim as our invention:

1. A process of stabilizing a petroleum cut against oxidation, comprising adding diphenylthiocarbazide in an amount sufficient to act as an inhibitor.

2. A process of stabilizing a petroleum cut against oxidation, comprising adding phenylthiosemicarbazide in an amount sufficient to act as an inhibitor.

3. A process of stabilizing a petroleum cut against oxidation, comprising adding o-tolyl thiosemicarbazide in an amount sufficient to act as an inhibitor.

4. A process of stabilizing a petroleum cut against oxidation, comprising adding an agent from the group consisting of thiocarbazides and thiosemicarbazides containing aryl groups, in an amount sufficient to act as an inhibitor.

5. A hydrocarbon motor fuel containing a small amount of diphenylthiocarbazide sufficient to act as an oxidation inhibitor.

6. A petroleum oil cut containing a small amount of phenylthiosemicarbazide sufficient to act as an oxidation inhibitor.

7. A petroleum oil cut containing a small amount of o-tolyl thiosemicarbazide sufficient to act as an oxidation inhibitor.

8. A petroleum cut containing an amount of an agent from the group consisting of thiocarbazides and thiosemicarbazides containing aryl groups, in an amount sufficient to act as an oxidation inhibitor.

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