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INHIBITING GUM IN CRACKED
DISTILLATES

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This invention relates to treatment of cracked petroleum distillates, and more particularly treatment for inhibiting gum formation therein; and it is among the objects of the invention to provide a process and product in which the tendencies toward gum formation are controlled. Another object is the provision of treatment for cracked distillates in a manner simple and readily applicable to such products irrespective of the particular detail of the antecedent cracking procedure. Other objects and advantages will appear as the description proceeds.

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

In accordance with the invention, a cracked petroleum distillate such as is prone to develop gum formation, is subjected, preferably in neutral condition, to the action of an amine and a mercaptan. These may be added to the distillate, with suitable mixing, or if desired one or more of the constituents may be provided in situ. Mixing may be accomplished batchwise, or proportionally in continuous manner, as may be preferred.

In the case of a distillate which contains mercaptan, the amine may be added, with suitable mixing, or amine may be generated in situ, by adding a halogenated alkyl compound and subjecting to the action of ammonia according to my copending application 389,083 filed Aug. 28, 1929, now Patent 1,919,825.

Quite a range of mercaptans may be availed of, but ordinarily the higher boiling mercaptans are desired, for example normal amyl mercaptan, iso amyl mercaptan, heptyl mercaptan, etc. As amine component, an alkyl amine is preferred, and particularly a higher boiling amine, for example di-normal propylamine, di-normal butylamine, etc.

The mercaptan and the amine may be provided in about equal amounts, and the total need not be in excess of 1 per cent., and preferably 0.001 to 0.5 per cent.

As an illustrative example: Normal amyl mercaptan and a di-normal butyl amine are added to a cracked gasoline, and in the proportion of about 0.05 pound each per barrel of the gasoline, with thorough mixing.

As another example: To a cracked naphtha

which has been lye treated, and is neutral in reaction, normal amyl mercaptan and di-normal propylamine are added in equal proportions to make about 0.02 per cent., and the naphtha is thoroughly mixed.

Instead of a pure amine or mercaptan, mixtures of amines or mercaptans may be employed respectively.

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

I therefore particularly point out and distinctly claim as my invention:—

1. A process of inhibiting gum-formation in cracked petroleum motor-fuel distillates, which comprises subjecting the cracked distillate to the action of a normally liquid aliphatic mercaptan soluble in the distillate and an aliphatic amine, in total amount not substantially in excess of 1 per cent.

2. A process of inhibiting gum-formation in cracked petroleum motor-fuel distillates, which comprises subjecting the cracked distillate to the action of a normally liquid aliphatic mercaptan soluble in the distillate and a secondary aliphatic amine normally liquid and soluble in the distillate, in total amount not substantially in excess of 1 per cent.

3. A cracked petroleum motor fuel distillate containing the reaction product of the ingredients thereof and a normally liquid aliphatic mercaptan soluble in the distillate and a secondary aliphatic amine normally liquid and soluble in the distillate, in total amount not substantially in excess of 1 per cent.

4. A cracked petroleum motor fuel distillate containing the reaction product of the ingredients thereof and a normally liquid aliphatic mercaptan soluble in the distillate and an aliphatic amine, in total amount not substantially in excess of 1 per cent.

5. A process of inhibiting gum-formation in cracked petroleum distillates, which comprises subjecting the cracked distillate to the action of di-normal butylamine and normal amyl mercaptan in total amount not much in excess of 1 per cent.

6. A cracked petroleum distillate containing the reaction products of ingredients thereof and di-normal butylamine and normal amyl mercaptan, the total amount of the amine and mercaptan being not much in excess of 1 per cent.

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