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HYDROCARBON OIL AND METHOD OF MAKING THE SAME

No Drawing. Application filed September 21, 1928. Serial No. 307,546.

The present invention relates to improvements in low boiling hydrocarbon oils such as naphthas and the like and will be fully understood from the following description.

In a copending application of the present inventors, Serial No. 307,545, filed September 21, 1928, the addition of certain substituted condensed ring compounds to naphthas, and particularly to cracked naphtha, has been disclosed. It was disclosed that these substances, even if present in very small quantities, less than 5 gram per litre and generally between the limits of .01 and 1.0 grams per litre, greatly reduce gum formation and prevent increase of gum on standing for prolonged, if not indefinite periods. This is particularly advantageous for motor fuels, cleaning naphthas, and the like.

We have discovered also that hydrocarbons such as naphthalene, anthracene, phenanthrene and the like, all of which have a condensed ring structure possess this property to a greater or lesser degree. One of these materials or a mixture of these with other materials such as alpha-naphthol, or alpha-naphthylamine may be added to the oil in the above mentioned proportions. The substances may be dissolved directly in the naphtha or may be added in concentrated solution in naphtha, benzol or other solvents which are miscible with naphtha, in the necessary degree.

The addition to the low boiling hydrocarbon oil of a polycyclic aromatic hydrocarbon such as naphthalene, anthracene, phenanthrene, together with an alpha substituted polycyclic aromatic compound such as alpha-naphthol will not only prevent gum formation but will also make the naphtha color stable during storage in the absence of sunlight.

Gum or more properly gum formation is determined by test method No. 530.1 of the U. S. Bureau of Mines Technical Paper 323 B, entitled "Specification for petroleum products and methods for testing", revised October 21, 1927, (page 96). In brief, the method consists in placing 100 cc. of the naphtha in a spun copper dish about 3½ inches in diameter on a steam bath and evaporating the volatile material. The result is expressed as milligrams of gum left in the dish per 100 cc. of naphtha.

As an example of the effect of these addition agents, the following tests are given:

Original naphtha____231 mg. of gum/100 cc.
Orig. naphtha + .10 gr.
naphthalene litre___166 mg. of gum/100 cc.
Orig. naphtha + .10 gr.
anthracene litre_____22 mg. of gum/100 cc.

The gum determinations are made by the copper dish method, above described.

Our invention is not to be limited by any theory of the mechanism of the process nor by the particular substances named since condensed ring homologues appear to be equally as good. We are to be limited only by the following claims in which we wish to claim all novelty inherent in our invention

We claim:

1. As a composition of matter a low boiling hydrocarbon oil normally tending to form gum and an addition agent comprising a mixture of a hydrocarbon with condensed nuclei of the naphthalene, anthracene and phenanthrene types, and a naphthalene compound having in the alpha position a group selected from the class consisting of hydroxyl and amino groups, such addition agent being present in gum inhibiting proportions only.

2. As a composition of matter a naphtha of the class produced by decomposition of hydrocarbons of higher molecular weight and normally tending to form gum and 0.01–5 grams per liter of a gum inhibitor comprising a hydrocarbon with condensed nuclei of the naphthalene, anthracene and phenanthrene types and a naphthalene compound having in the alpha position a group selected from the class consisting of hydroxyl and amino groups.

3. As a composition of matter a naphtha of the class produced by the decomposition of hydrocarbons of higher molecular weight and normally tending to form gum and 0.01–1 gram per liter of a gum inhibitor comprising a hydrocarbon with condensed nuclei of the naphthalene, anthracene and phenanthrene types and a naphthalene compound

having in the alpha position a group selected from the class consisting of hydroxyl and amino groups.

4. A composition of matter comprising a cracked naphtha normally tending to form gum and 0.01–1 gram per liter of a gum inhibitor comprising naphthalene and alpha naphthylamine.

5. A composition of matter comprising a cracked naphtha normally tending to form gum and 0.01–1 gram per liter of a gum inhibitor comprising naphthalene and alpha naphthol.

6. A composition of matter comprising a cracked naphtha normally tending to form gum and 0.01–1 gram per liter of a gum inhibitor comprising anthracene and alpha naphthol.

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