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PRODUCTION OF MOTOR FUELS

Martin Mueller-Cunradi and Robert Uloth, Ludwigshafen-on-the-Rhine, Germany, assignors to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany

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6 Claims. (Cl. 196—13)

The present invention relates to improvements in the production of motor fuels.

We have found that motor fuels, or additions to other motor fuels, having excellent non-knocking properties are obtained by extracting benzines or benzine fractions with acetonitrile and using the extracts. The treatment with acetonitrile may be effected with special advantage by treating with acetonitrile benzines having different boiling ranges which may be obtained by splitting up a definite initial benzine, into several fractions as for example light benzine boiling up to from 100° to 130° C. and heavy benzine boiling above from 100° to 130° C. or other fractions having other boiling point ranges, whereby in each case a separation takes place into a layer which consists of a solution in acetonitrile of a benzine having better non-knocking properties than the benzine employed as initial material, and a layer having lower non-knocking power. The layers are separated, the acetonitrile is removed by suitable methods from the acetonitrile solution, as for example from a heavy benzine fraction boiling higher than acetonitrile or from a light benzine fraction boiling lower than acetonitrile by simple distillation, and from a benzine fraction boiling from 70° to 110° C. for example by washing with water, and the extracts may be employed as such or mixed with each other or with other motor fuels, as for example with non-pretreated benzine in proportions which depend on the non-knocking effect which it is desired to obtain. There may also be added to the extracts fractions of the benzine residues remaining after the extraction, as for example the portion of the treated heavy benzine of low anti-knock power.

For the extraction according to the present invention usually from 0.1 to 10 parts of acetonitrile and preferably from 1 to 3 parts of the substance are employed per each part of benzine or benzine fraction, but the acetonitrile may also be employed in larger or smaller amounts.

The treatment of the benzine is preferably effected at ordinary temperature, but reduced or increased temperatures may also be used. The extraction may be carried out in suitable apparatus, as for example in a stirring apparatus, in a trickling column or in turbo or orifice mixers, with the whole amount of solvent at once or in several stages. The action of the acetonitrile may be improved by suitable additions which reduce the solubility of the acetonitrile in benzine, such as water, formamide or glycol.

The following examples will further illustrate the nature of this invention but the invention is not restricted to these examples. The parts are by volume.

Example 1

Benzine is split up into a light and heavy benzine fraction. The heavy benzine boiling above 130° C. and having an octane value of 66 is treated with acetonitrile in the ratio of 1:1 at 20° C. After separating the two layers formed and removing the acetonitrile, there are obtained:

(*a*) 31.66 parts having an octane value of 90 and
(*b*) 68 parts having an octane value of 59

The light benzine boiling up to 130° C. and having an octane value of 72 is treated with acetonitrile in the ratio of 1:1. There are obtained:

(*c*) 22 parts having an octane value of 82 and
(*d*) 78 parts having an octane value of 65

By mixing the anti-knock fractions (*a*) and (*c*) there are obtained 25.8 parts of benzine having an octane value of 86 as compared with 70 for the initial benzine. By mixing the 25.8 parts having an octane value of 86 with 43.2 parts of the light benzine (*d*) having an octane value of 65, there are obtained 69 parts of benzine having an octane value of 75.

The anti-knock fractions (*a*) and (*c*) may be employed each as such or both together in any admixture with each other.

Example 2

A benzine obtained by destructive hydrogenation of mineral coal and having a specific gravity of 0.750 at 20° C., a refractive index of

$$n_D^{20}=1.4210$$

and an octane value of 68 is twice extracted at 20° C. with the same volume of acetonitrile. The acetonitrile is removed from the extract and from the extraction residue by washing with water. In this manner are obtained:

(*a*) 54 parts of a benzine having a specific gravity of 0.768, a refractive index of

$$n_D^{20}=1.4331$$

and an octane value of 79, and

(*b*) 46 parts of a benzine having a specific gravity of 0.738, a refractive index of

$$n_D^{20}=1.4128$$

and an octane value of 54.

Fraction (*a*) may be employed alone or in admixture with any desired portion of fraction (*b*).

What we claim is:

1. A process for dividing a liquid hydrocarbon mixture boiling within the boiling point ranges of benzine into fractions having different octane values which comprises treating the said liquid hydrocarbon mixture with acetonitrile, two separate layers thus being formed, separating the said layers from each other and removing acetonitrile from the layer containing the bulk of acetonitrile.

2. A process for dividing a liquid hydrocarbon mixture boiling within the boiling point ranges of benzine into fractions having different octane values which comprises treating the said liquid hydrocarbon mixture with acetonitrile, two separate layers thus being formed, separating the said layers from each other and removing acetonitrile from the layer containing the bulk of acetonitrile and from the other layer.

3. A process for preparing from a benzine a fraction having a better octane value than said benzine which comprises treating said benzine with acetonitrile, two separate layers thus being formed, separating the said layers from each other and removing acetonitrile from the layer containing the bulk of acetonitrile.

4. A process for the production of a non-knocking motor fuel which comprises treating a plurality of benzine fractions having different boiling point ranges with acetonitrile, separating from each fraction the acetonitrile-soluble subfraction, removing acetonitrile from each acetonitrile-soluble subfraction and then combining the subfractions.

5. A process for preparing a non-knocking motor fuel from a benzine which comprises dividing said benzine into a plurality of fractions having different boiling point ranges then treating at least one of the said fractions with acetonitrile, two layers thus being formed, and separating the acetonitrile from each layer containing the bulk of the acetonitrile.

6. In the process as claimed in claim 5 treating at least one benzine fraction with acetonitrile, separating the acetonitrile from each layer containing the bulk of the acetonitrile and adding the remaining acetonitrile-soluble portions to other motor fuels or to parts of the acetonitrile-soluble portions.

MARTIN MUELLER-CUNRADI.
ROBERT ULOTH.

CERTIFICATE OF CORRECTION.

Patent No. 2,159,175. May 23, 1939.

MARTIN MUELLER-CUNRADI, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 24-25, claim 6, for "acetonitrile-soluble" read acetonitrile-insoluble; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of February, A. D. 1940.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

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