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MOTOR FUEL

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2 Claims. (Cl. 44—9)

This invention relates to a composition of matter suitable for motor fuel, and is particularly concerned with gasoline type motor fuels comprising or blended with certain secondary alcohols which tend to reduce the knocking of the engine.

The expression "gasoline type fuel" as used in this specification and the appended claims refers to fuels used in spark ignition engines, examples of such fuels being liquefied normally gaseous hydrocarbons, aviation gasoline, automotive gasoline, and tractor fuel, as well as blends of hydrocarbons with ethyl alcohol, similar oxygenated hydrocarbons, and the like. Fighting grade aviation gasoline boils up to about 140° C., automotive gasoline up to about 220° C., and tractor fuel up to about 300° C.

It has now been found that normally liquid alcohols of six or more carbon atoms, having at least two aliphatic hydrocarbon radicals linked to the carbinol group, at least one of which groups is a branched chained aliphatic radical, and boiling within the boiling range of gasoline type fuels, i. e., which boil below about 300° C. are highly useful for reducing the knocking of spark ignition engines, and may be used alone as a motor fuel or as blending agents in gasoline type fuels, because they have relatively high anti-knock properties, and improve the anti-knock properties (i. e., they raise the octane number) of the blended fuel. The most desirable alcohols are those having from six to ten carbon atoms in the molecule, although higher alcohols which are liquid may also be employed.

As is apparent from the definition given above, the alcohols have the formula: R—C(OH)(R')—R'' wherein R represents an aliphatic hydrocarbon radical, such as normal aliphatic, branched chain aliphatic, or cyclic aliphatic, R' represents hydrogen or an aliphatic hydrocarbon radical, and R'' represents a branched chain aliphatic hydrocarbon radical, such as isopropyl, isobutyl, tertiary butyl, isoamyl, and tertiary amyl radicals. The aliphatic chains may be saturated or unsaturated. The alcohols which are poor solvents for water are generally preferred when there is danger of contamination with water. If used in fighting grade aviation gasoline which should have an A. S. T. M. 90% boiling point not above 135° C., alcohols of 6 or 7 carbon atoms, especially methyl isobutyl carbinol, are especially desirable; and if used in automotive gasoline having an A. S. T. M. 90% boiling point of not above 200° C., alcohols of 6 to 10 carbon atoms are more useful.

Specific examples of suitable alcohols are: ethyl isopropyl carbinol, methyl isobutyl carbinol, dimethyl isopropyl carbinol, methyl tertiary butyl carbinol, ethyl isobutyl carbinol, methyl isoamyl carbinol, di-isopropyl carbinol, and methyl di-isopropyl carbinol. Of these methyl isobutyl carbinol is the preferred example.

While the anti-knock value of these pure alcohols is comparatively high, it was found that their greatest value lies in their ability to raise the octane numbers of gasolines, and particularly of gasolines consisting predominantly of non-aromatic hydrocarbons, when blended therewith. For example, upon testing mixtures containing various amounts of methyl isobutyl carbinol and a gasoline having an octane number of 43, as determined by the A. S. T. M. method D-357-34-T were tested, the octane numbers of the blends were as shown in the following table:

Percentage methyl isobutyl carbinol in blend	A. S. T. M octane number
20	55.3
40	66.2
60	77.8
80	87.6
100	95.3

It is understood that these alcohols may be blended with hydrocarbon fuels in any desired proportions; however, the greatest advantage is gained when making blends containing between about 5 and 60% of alcohol.

Small quantities of metal-organic or organic catalytically acting knock suppressors, such as tetraethyl lead, iron carbonyl, nickel carbonyl, organic selenium compounds, aniline, etc., may also be used together with the alcohol in the composition according to this invention.

I claim as my invention:

1. A gasoline type motor fuel containing from 5 to 60% methyl isobutyl carbinol.

2. In a process of running a spark ignition engine, the step of subjecting a gasoline type motor fuel containing 5 to 60% methyl isobutyl carbinol to combustion in said engine as an anti-knock fuel.

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