ETHYL GASOLINE CORPORATION

MANUFACTURING AND TRAFFIC DEPARTMENT

INTER-OFFICE
CORRESPONDENCE

MAIL ADDRESS: BOX 688, WILMINGTON, DEL.
FREIGHT ADDRESS: CARNEY'S POINT, N.J.
TELEPHONE: PENNS GROVE, N.J. 280, EXTENSION 213.

April 21, 1937

Dr. Robert A. Kehoe

Dear Bob:

Attached hereto is a Patent Specification submitted by the I. G. for a process for stabilizing tetraethyl lead and ETHYL Fluid mixtures using a neutral alkali metal fluoride. While possibly you may have seen this patent, I am passing it along to you for what it might be worth as I think there is some possible interest to you in the method of application of introduction of the fluoride into the tetraethyl lead. It would seem to me that any wholesale application of this patent to Fluid in Germany might involve a serious health hazard.

I arrived in the States last Friday, and I am attempting this week to more or less pick up a general trend of the affairs here at the plant. I should however be glad to sit down and discuss the situation abroad sometime at your convenience as undoubtedly you would like to know the general status of such. I find that we are having a safety program at the plant and in Wilmington commencing May 3, and I hope you will find the opportunity to attend these meetings. If so we may possibly at that time discuss the foreign situation.

With kindest regards, I remain

Sincerely yours,

J. H. Schaefer

A:AB

PATENT SPECIFICATION

Convention Date (Germany): Oct. 26, 1935 461,604

Application Date (in United Kingdom): Aug. 13, 1936. No. 22360/36

Complete Specification Accepted: Feb. 19, 1937

COMPLETE SPECIFICATION

PROCESS FOR STABILISING LEAD TETRAETHYL AND ANTI-KNOCK MIXTURES CONTAINING SAME

We, I. G. Farbenindustrie Aktiengesellschaft, a body corporate organised under the Laws of Germany, of Gruneburgplatz, Frankfurt-on-the-Main, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a process of stablising lead tetraethyl and anti-knock mixtures containing the same.

The "anti-knock" agents which have of late been extensively used as additions to motor fuels and which contain as active constituent, lead tetraethyl in admixture with other organic compounds, have the undesirable property of gradually decomposing during storage, particularly when exposed to light.

In Specification No. 414,581 we have proposed to counteract this tendency of lead tetraethyl to decompose, by adding to the anti-kncok compounds, or the motor fuels, containing the same, water-soluble fluorides, and more particularly neutral alkali metal fluorides, in extremely minute doses (a few parts in ten thousand). These extremely minute additions generally suffice to prevent decomposition of the lead tetraethyl, when the latter has already been added to the motor fuels, since the amount of alkali metal fluoride needed to stabilise the lead tetraethyl is readily absorbed by motor fuels owing to its being soluble therein to an appreciable extent. However, in the case of lead tetraethyl alone, or in the case of the usual mixtures of that substance with other organic substances serving to lower the vapour pressure, absorption does not take place to the requisite extent, because the alkali fluorides are practically insoluble in lead tetraethyl. In fact, when the amounts of alkali metal fluoride, considered, in accordance with the former proposal, as sufficient, are added to the anti-knock agent itself, decomposition phenomena, due to insufficient solubility of the added stabiliser, will nevertheless make their appearance, during storage under exposure to light, and ultimately result in the mixture becoming thoroughly spoiled.

It has now been ascertained, in accordance with the present invention, that the lead tetraethyl can be caused to absorb the amount of alkali metal fluoride required for its stabilisation by maintaining in suspension for a considerable period and preferably at elevated temperature, in the liquid lead tetraethyl or in mixtures thereof with other organic compounds serving to lower its vapour pressure, a larger amount of finely dispersed alkali metal fluoride than is directly soluble in the lead tetraethyl. In this manner, the amount of alkali metal fluoride combined by the lead tetraethyl, possibly as an only gradually formed additive compound, can be increased, for example, to about ten times the amount absorbed under other conditions and the anti-knock agent can thus be rendered practically light proof, even when stored for a long time by itself.

The process of the present invention can be carried out in various ways. Good results are obtained even by merely shaking or stirring the two components of the desired mixture together for some considerable time, for example, several hours, and then separating the

filtration. Better results are however obtained by boiling the lead tetraethyl, or the anti-knock mixture with an excess of alkali metal fluoride, under a vacuum, in the reflux condenser.

EXAMPLE

1000 cc. of a known anti-knock mixture containing 60% of lead tetraethyl, 30% of dibromoethylene and 10% of monochloronaphthalene, are boiled at 40-50°C. in a reflux condenser, for 1 to 2 hours and under a vacuum of 10 to 15 mm. with 10 grams of a mixture of equal amounts of potassium--and sodium fluoride. The liquid is then filtered off from the undissolved sediment. The liquid now contains o.05% of fluoride. No precipitation due to decomposition of the lead tetraethyl is observable in the anti-knock agent treated in this manner, even after it has been stored for months under exposure to light.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:--

1). A process of stabilising lead tetraethyl and anti-knock mixtures containing the same, by means of alkali metal fluorides, which comprises maintaining an excess of finely dispersed alkali metal fluoride in suspension in said lead tetraethyl or anti-knock mixture, for a considerable time and preferably at elevated temperature, and finally removing the undissolved residue.

2). Process as claimed in claim 1, in which the mixture is boiled in the reflux condenser, under a vacuum.

3). The process of stabilising lead tetraethyl and anti-knock mixtures containing the same, substantially as described.

4). A stable lead tetraethyl or anti-knock mixture containing the same whenever prepared by the process claimed in any of the preceding claims.

Dated this 13th day of August, 1936,

ALBERT L. MOND & THIEMANN,
19, Southampton Buildings,
Chancery Lane, London, W.C.2,
Agents for the Applicants.

Leamington Spa : Printed for His Majesty's Stationery Office, by the Courier Press-1937