

ESSO RESEARCH AND ENGINEERING COMPANY

(FORMERLY STANDARD OIL DEVELOPMENT COMPANY)

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MEDICAL RESEARCH DIVISION

TELEPHONE: WABASH 5-1600

December 6, 1960

Mr. Erich Schmidt
Ministry of Health
OCISP Apartado 1723
Caracas, Venezuela, S. A.

Dear Mr. Schmidt:

Thank you for your letter of November 17, 1960 requesting comments relative to lead additives in gasoline, with particular reference to the increase in permissible concentration of TEL, and the introduction of TML in motor gasoline. We have been quite interested in these developments for some time. As you no doubt know, work is being done here on increasing TEL from 3.0 to 4.0 cc per gal. Also, TML is being introduced in this country as well as other locations.

We shall be happy to comment on the specific points you raise and give you basis for our judgment. In any area where we do not have sufficient information in order to form a judgment, we shall certainly say so.

a) Should the increase of TEL be permitted?

For this question you indicate that the necessary background data are available in Public Health Service Publication No. 712, which you have, therefore, we shall not comment on this point.

b) How should the usage of TML be regulated?

Available toxicity data for TML suggest that by inhalation, it has about the same order of toxicity as TEL. Also, it is roughly 1/2 as toxic as TEL by intravenous administration, about 4 times as toxic subcutaneously, about twice as toxic by mouth, and about 1/10 as toxic by skin absorption. From this, one may conclude that the total toxicity of the two compounds is substantially of the same order.

Since these two compounds appear to have the same order of toxicity, there seems no reason to suggest different handling precautions and usage. The

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precautionary measures for handling TEL have been highly successful over the years. The few difficulties in handling TEL have resulted from violation of the established rules for handling the material, rather than failure or inadequacies of the precautionary measures themselves. It would, therefore, seem reasonable and proper to follow precautionary measures established for the handling and usage of TEL, for the handling of TML. There is one point, however, where some comment should be made. TML is considerably more volatile than TEL, and this factor makes it highly important not to depart from the established precautionary measures in the handling of TML. However, where these rules are followed, the precautionary measures should be sufficient to preclude any possible difficulty.

With further reference to the volatility of TML, it should be pointed out that extensive data are not available on the rate of volatilization of this material from motor fuel. Therefore, it might be helpful to do some atmospheric sampling around tank truck loading, filling station operations and other possible sources of exposure. Although this falls outside of precautionary measures for the handling of the additive, or its concentrate, such studies should provide helpful information in connection with the finished motor fuel.

c) What maximum should be stated for the TML?

Since most of the environmental and clinical studies on motor fuel containing TEL have been related to a TEL concentration of 3.0 cc per gal., this serves as a reasonable reference point for comparative purposes. It would be our suggestion, therefore, that the maximum TML be stated as the lead equivalent of 3 cc of TEL. I believe this calculates to a figure of 2.0% cc of TML per gal.

d) Can all the leaded additives for gasoline be regulated as a group, or should each substance be treated separately?

Our feeling here is that we should confine our remarks to the two lead compounds for which we have some information, namely, TEL and TML. Since as pointed out above, these have comparable toxicities, there appears no reason why they cannot be handled together with proper allowance in terms of lead equivalents. Conceivably, there may be other lead additives introduced at a later date, and for such compounds we would suggest that they ought to be handled individually, based on toxicity data for the respective compound. It might be that such an additional lead additive would have properties which would suggest that the compound could be handled in the same type group as TEL or TML. On the other hand, such a compound might differ greatly, and to such an extent that separate consideration should be given to its handling. However, we feel that this cannot be determined at this time, and judgment would have to be made on the basis of data for the additives in question.

Mr. Erich Schmidt

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c) What maximum should be stated if a mixture of TEL and TML or other leaded additives is used?

In the case of TEL and TML, we would suggest a total lead content not exceeding the equivalent of 4.0 cc of TEL, and the TML content not to exceed the equivalent of 3.0 cc TEL. In our judgment we refer to the original value of 3.0 cc per gal. of TEL as the point of reference for comparative purposes. Extensive data are available, both in terms of environmental exposures and clinical studies with this level of TEL. On the other hand, similar data are not available for TML. We, therefore, feel that one should hold to the 3.0 cc equivalent of TEL until more data are available for TML. At such a time, the data might possibly suggest a change in this judgment.

With reference to lead additives other than TEL or TML, we would rather not express an opinion on these because we do not have information on toxicity, environmental or clinical studies related to these compounds.

We understand from Dr. Robert Kehoe of Kettering Laboratories that he is writing you concerning these same points. We further understand that he will provide you with certain toxicity data and, perhaps, other information. Since he is sending this material to you, we are sure that it would include any data we might have.

We appreciate the opportunity of commenting on this problem, and if we can be of further help, please let us know.

Very truly yours,

N. V. HENDRICKS,
Senior Engineering Associate

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cc: A. Bortone, M.D.
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bcc: R. A. Kehoe, M.D.

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