

ETHYL GASOLINE CORPORATION

CHEMICAL RESEARCH LABORATORY

1600 ~~4600~~ WEST EIGHT MILE ROAD

DETROIT, MICHIGAN

January 9, 1941

Dr. Willard Machle
Kettering Laboratory of Applied Physiology
University of Cincinnati
Eden Avenue
Cincinnati, Ohio

Dear Bill:

1. With reference to your letter of January 6, Gambrill's letter to you of January 7 with enclosures takes care, I believe, of your first two queries regarding the analysis of filter discs and the analysis for bromine.

2. The next point you raise in the same letter, regarding calculating results of combustion in terms of lead halide, is not at all clear to me. If you have in mind my suggestion of analyzing combustion gases mixed with air, and calculating back the corresponding lead input, the following is the method:

One gallon of gasoline, of measured specific gravity means so many grams of carbon and hydrogen plus so many measured milligrams of lead. Safely neglecting the insignificant amount of carbon deposited in the equipment, and safely estimating the gross analysis of gasoline to correspond to CH_2 , we can take any sample of combustion gases mixed with an unknown amount of air, and by analyzing same for carbon, i.e., $\text{CO} + \text{CO}_2$ we can compute the quantity of gasoline from which this gas comes. This gives us the corresponding quantity of lead. If that gas is passed through a suitable absorber for lead, by comparing the lead collected with that calculated to correspond to the $\text{CO} + \text{CO}_2$ throughput, i.e., to the corresponding gasoline input, you will get a direct measure of the percentage of the lead input collected at that point.

If the above does not answer your question, I would appreciate your coming back with a more explicit statement of the problem.

3. I note with interest the information given in your letter of January 7 on the presence of volatile lead compounds in air above samples of sludge. Incidentally, in view of the availability of these data, it is a little

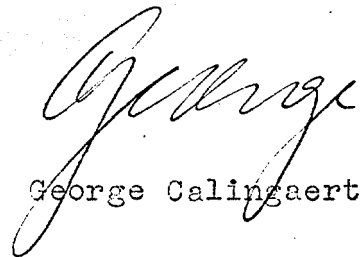
Dr. Willard Machle

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hard for me to understand why Oscar Lewis was still inquiring from me recently regarding "the vapor pressure of lead sludge".

Very sincerely yours,

A handwritten signature in cursive script, appearing to read "George".

George Calingaert

GC:AMC

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