

GENERAL ELECTRIC COMPANY

Research Laboratory

1 River Rd.
Schenectady, N.Y.
Oct. 11, 1940

Mr. George Calingaert, Director
Chemical Research Laboratory
Ethyl Gasoline Corporation
Detroit, Michigan

Dear Mr. Calingaert:

Finally now I can answer your letters of March 4 and July 26 relative to the sensitivity of the mercury detector to tetraethyllead.

I have just completed a preliminary test using nitrogen as a carrier, part of it going through three bubbling tubes in series and the rest of it acting as a diluter under measured conditions. This mixed gas went into the mercury detector and was exhausted outdoors. The rough curve I obtained giving meter reading versus concentration shows that $1/4$ scale reading occurs at 100 parts per million by volume. This would be linear up to approximately $3/4$ scale reading and would saturate to full scale at higher concentrations. The first observation to be made relative to this sensitivity is that I had no assurance that the gas was saturated after leaving the bubbling tubes, especially with the small amounts of tetraethyllead in these tubes. In the second place this concentration need not be taken as a sensitivity limit due to the possibility of expanding the scale by a factor of at least 10.

A further observation which I have not yet satisfactorily answered is that there is a residual reading of the meter after passing the lead mixture through the detector and scavenging it with uncontaminated gas. This residual reading may be as high as 30% of the test reading. One possible reason for this may be the deposition of lead or a compound on the phototube or UV lamp due to activation by the 2537 Å radiation. I have tried wiping the tubes with a water-moistened cotton pad with no success.

If the sensitivity of the detector as I have just given it is of the right order of magnitude for your use and if you are still interested, further tests should be conducted for which I shall need at least 100 cc. of tetraethyllead.

Very truly yours

(signed)

T. T. Woodson

T.T.Woodson:W

cc/JH

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