

EVAPORATION OF LEAD ALKYL

The studies summarized here were intended to provide some information about the lead-in-air levels that result when TML, TEL, or alkyl mixtures are handled in typical motor gasolines.

Table I summarizes the data obtained in several sets of experiments. First are shown "Vapor over fuel" data which are a composite of glassware and drum experiments and show the concentrations of Pb in the vapors above gasoline under equilibrium conditions. These values are representative of those that would be obtained in the vapors displaced as a partially filled tank or drum was refilled. A 1 N iodine solution was used to trap the lead alkyl vapors in a "lead-in-air" bubbler and the lead was determined by the dithizone method. It can be noted that the relative lead concentrations were roughly proportional to vapor pressures. A single observation at San Bernardino of the lead in the vapor in a car tank confirms the TEL values obtained at Detroit very well.

Measurements made of lead in air during automobile refueling are shown under "Garage Sampling." Detroit and San Bernardino locations are shown along with the general conditions prevailing at the time the sampling was done. The number of cars refueled while each sample was taken is shown by the numbers in parenthesis. It will be observed that the absolute values for TEL cover a wide range as does the ratio of lead from TML to lead from TEL. This variability simply emphasizes the fact that a large number of observations during vehicle

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refueling would be required to establish the true levels of lead-in-air as a function of lead alkyl volatility. There is no reason to believe, however, that the ratios shown by the glassware and drum experiments are not approximately correct.

Harold J. Gibson

HJG/MI
1/15/59

KE 0020789

EVAPORATION OF TEL, TML, AND MIXTURES OF THE METHYL-ETHYL ALK

	<u>TEL</u>	<u>MA-250</u>	<u>MA-500</u>	<u>MA-750</u>
Vapor Press., mm at 20C	0.26	1.7	4.5	12.0
Relative to TEL	1	6	17	46

Lead-in-Air, micro g/Cu.M.:	<u>Conc.</u>	<u>Conc. to TEL</u>	<u>Conc. to TEL</u>	<u>Conc. to TEL</u>
Vapor over fuel (Glassware & Drum Expts. carried out in Detroit at 65-75°F)	2,200	7,000 3.2	19,500 8.9	32,000 14.5
Car Tank Vapor: San Bernardino - Fuel Temp. 83°F	2,500	-	-	-
Garage Sampling: 1' out and 1' up from filler pipe opening				
Detroit 70°F inside and out- side. Doors closed, air quiet.	(196(6) * (170(6)	-	-	-
Detroit 25-35°F outside, 70°F inside, cars cold, space heaters running	55(10)	-	(367(4) 6.7 (441(4) 8.0	-
San Bernardino 80°F in and out, doors closed, quiet air	35(3)	-	-	-

TEL

Conc.

1' out and 2' up from filler
pipe opening

Detroit 70°F inside and out-
side. Doors closed, air
quiet.

120

1' out and 1' below filler pipe
opening

Detroit 70°F inside and out-
side. Doors closed, air
quiet.

590

San Bernardino 80°F in and
out, doors closed, quiet air.

425

Car tank vapor:

San Bernardino fuel tempera-
ture 88°F.

2500

* number of cars averaged.

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<u>MA-250</u>	<u>MA-500</u>	<u>MA-750</u>	<u>TML</u>	<u>Ratio</u>
				<u>Conc. to TEL</u>
-	-	-	5,200	43.3
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

YE 0020791

H. J. Gibson 1/13/59

Based on table by W. A. Gibson
dated 12/15/58