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William F. O'Keefe  
Vice President



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July 20, 1984



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Mr. Martin Greif  
Executive Secretary  
TSCA Interagency Testing Committee  
Environmental Protection Agency (TS-792)  
East Tower Room 539 C  
401 M Street, SW  
Washington, DC 20460

Dear Mr. Greif:

In response to the listing of methylcyclopentane as a compound under consideration by the TSCA Interagency Testing Committee (ITC) (48 Fed. Reg. 51519; November 9, 1983), the American Petroleum Institute (API) is submitting the attached information. As this profile reflects, methylcyclopentane is not intentionally manufactured by the petroleum refining industry; rather, methylcyclopentane occurs naturally in crude oil and may also be inadvertently produced in catalytic cracking or pyrolysis units. Thus, small quantities of this chemical substance can be detected in refinery process streams and in finished products.

The API surveyed member companies to obtain quantitative data on the levels of methylcyclopentane found in these intermediate streams and/or finished products. As the responses in Table I reflect, the concentrations reported were low, as anticipated due to the incidental occurrence and production of the compound. The results submitted from one exposure study involving over 5500 samples from workplaces (primarily refineries) demonstrated that worker exposure to methylcyclopentane was at low levels with an average exposure of 0.25 ppm (eight hour time weighted average).

As the ITC is aware, API has on several occasions stated its research policy regarding the evaluation of the health hazards of our complex hydrocarbon mixtures. We reluctantly feel obligated to repeat our position again, because of its relevance to the ITC's deliberations on methylcyclopentane.

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We believe that the testing of minor components of a complex mixture, such as methylcyclopentane, is inappropriate prior to the evaluation of the mixture itself. Test results on an isolated compound are of dubious scientific relevance absent the context of test results on the parent mixture.

If you should have any questions regarding the enclosed information, please feel free to contact Amy Shepard of my staff at 682-8475.

Sincerely,

A handwritten signature in cursive script, appearing to read "W. O'Keefe", written in black ink.

William F. O'Keefe  
Vice President

Enclosures

## API Profile of Methylcyclopentane (CAS #96-37-7)

Methylcyclopentane is a  $C_6H_{12}$  cycloparaffin with a molecular weight of 84.16 and a boiling point of 161.25°F. (71.80°C). Methylcyclopentane occurs naturally in crude oils and in natural gas liquids. In crude oils it is found at concentrations of approximately 0.80 volume percent.

The petroleum industry does not intentionally manufacture methylcyclopentane; however, it is produced incidentally at refineries in catalytic cracking and pyrolysis units. It can be found in straight run and cracked naphthas, fluid catalytic cracked gasoline, visbreaker naphthas, coker naphthas, and other refinery process streams at the concentrations reported in Table I. The methylcyclopentane that occurs in naphtha streams, however, may be catalytically reformed, which reduces its concentration in the blending components of finished products.

Although methylcyclopentane is an inadvertent component of many finished products, it has no use as an intentional additive to any finished petroleum product. Methylcyclopentane occurs in several refinery naphtha streams which may be blended directly to gasoline, JP-4, solvents and thinners. As shown in Table I, concentrations of methylcyclopentane in finished gasoline range from 0.35 to 3.15 volume percent.

Estimates of annual inadvertent refinery output of methylcyclopentane vary greatly. Factors such as crude processing capacity, catalytic cracking capacity and reforming capacity all will affect a refinery's output of methylcyclopentane as an incidental component of finished products.

API is aware of only one exposure study conducted by the petroleum industry on methylcyclopentane. One refiner reported that a recently completed air monitoring study of workplaces (primarily refineries) found an average exposure of 0.25 ppm methylcyclopentane (eight hour time weight average), based upon the analysis of 5,589 samples.

Additional data on expected levels of exposure to methylcyclopentane have been derived from the theoretical model developed by API and presented to the ITC on May 18, 1984. As stated by API during this presentation, the expected eight-hour, time-weighted exposure levels calculated for methylcyclopentane exposure at service stations range from 0.04 ppm to a high of 0.95 ppm in a "worst case" scenario.

With regard to existing toxicity data on methylcyclopentane, the API included this material in the initial phase of its ongoing nephrotoxicity screening of unleaded gasoline components.<sup>1</sup> Two dose levels of methylcyclopentane, 0.5 g/kg and 2.0 g/kg, were administered to male rats via oral gavage for four weeks. Based on a subjective scoring system, average nephropathy ratings for gross kidney abnormalities were 2.9 and 3.4 respectively. Negative control results for saline were comparable; the positive control rating was 9.2. These negative results indicate that methylcyclopentane does not exert nephrotoxic effects under the conditions of this experiment.

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<sup>1</sup> "Four Week Oral Nephrotoxicity Screening Study on Male F 344 Rats", Submitted to EPA on December 9, 1983, EPA FYI No. AX-1203-0280.

**Table I - Concentrations of Methylcyclopentane  
in Refinery Process Streams and Finished  
Petroleum Products<sup>a</sup>**

	Volume Percent
<b>A. Refinery Process Streams</b>	
1) Straight run naphthas	1.0-5.0
a) Intermediate	≤5.0
2) Straight run gasoline	0.18-10.0
a) Light	0.18-10.0
b) Natural	2-4
3) Cracked naphthas	
a) Light	≤3.0
b) Heavy	≤5.0
4) FCC Gasoline	0.287-3.037
a) Light	2.563-3.037 <sup>b</sup>
b) Heavy	0.287 <sup>c</sup>
5) Reformer Charge	0.5-3
6) Reformate	0.2-1.187
a) Light	1.187 <sup>c</sup>
b) Heavy	0.495-0.584 <sup>b</sup>
c) Reformate gasoline	0.22
7) Visbreaker Naphtha	0.5-2.0
8) Coke naphtha	0.5-2.0
9) Whole xylene	0.065 <sup>c</sup>
10) Udex Raffinate	3.64

<sup>a</sup> These data were compiled from reports by 15 major oil companies.

<sup>b</sup> Analyses performed on two samples.

<sup>c</sup> Analysis performed on a single sample.

**B. Finished Products**

1) Gasoline	0.35-3.15 <sup>d</sup>
a) Unleaded Premium	0.90
b) Unleaded Regular	0.9-1.26
c) Leaded Regular	1.24-2.5
2) JP-4	1.82
3) Solvents and thinners	≤5.0-15
a) Hexane solvent	7-15

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<sup>d</sup> One company reported that methylcyclopentane was found in all of the 84 gasoline samples it tested. The average concentration was 1.27 volume percent with a range of 0.13-3.15 volume percent.