

Monsanto

FEB 13 1979

MONSANTO INDUSTRIAL CHEMICALS CO.
800 N. Lindbergh Boulevard
St. Louis, Missouri 63166
Phone: (314) 694-1000

February 12, 1979

Mr. Harry U. Gilmer
Master Host Inn, Room 128
900 Vandiver Drive
Columbia, Missouri 65201

Dear Mr. Gilmer:

This memo is in response to requests you made during the course of our recent telephone conversations regarding the spill of o-Chlorophenol Crude at Sturgeon, Missouri.

You asked that we determine the amount of tetrachloro-dibenzo-p-dioxin in our reserve sample of the tank car shipment. We performed this analysis in triplicate and obtained values of 0.034, 0.036, and 0.040 ppm total tetrachloro dioxins. We were not able to distinguish the isomer or isomers involved. This information was developed late in the afternoon of February 9, 1979 and was transmitted to you by telephone about 7:30 PM that evening.

Attached is a copy of the basic method used for this analysis, along with a memo describing the minor changes made to adapt the method for use with ortho-chlorophenol. The detection limit for tetrachloro dioxins is 0.010 ppm.

You had requested two portions of our reserve sample of o-Chlorophenol Crude, Lot KLOJ-8001, Car No. GATX 12932; one to be shipped to you at Kansas City, and the other to Mr. Charles Poole, Office of Toxic Substances, Washington. Instead of shipping them, the samples were hand delivered at about 7:30 PM on February 10 to Billy Fairless, EPA Region 7, at the Midcoast Aviation Services Terminal at Lambert International Airport, St. Louis. This was at your later request on February 10.

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The Krummrich Plant analytical ticket on the shipment involved mentioned a Total Phenol content of 79.26%. You asked that I confirm in writing what this means.

Our specification for o-Chlorophenol Crude calls for a minimum of 70% equivalent phenol. The number of 79.26% is the sum of the free phenol content and the phenol stoichiometrically required to form the quantities of the chlorophenol components determined by GLC analysis.

You asked that I explain why we would not expect the 2,3,7,8 tetrachloro-dibenzo-p-dioxin to be present in significant amounts in our product.

In our chlorophenol operation, the primary products are 4-Chlorophenol and 2,4-dichlorophenol. In preparing the 4-Chlorophenol, we also form the 2-Chloro isomer which is separated by distillation and is a component of o-Chlorophenol Crude.

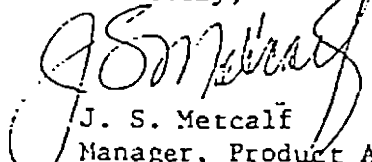
In preparing 2,4-dichlorophenol, we form a small amount of the 2,6 isomer and traces of trichlorophenol. Since chlorine attacks the phenol molecule primarily in the ortho and para or 2,4,6 positions, this trichlorophenol is present as the 2,4,6 isomer. This material is present in highboilers from the distillation of 2,4-dichlorophenol and is another component of o-Chlorophenol Crude.

Some tetrachloro dioxins are formed by the condensation of two molecules of trichlorophenol. The 2,4,6 isomer will form the 1,3,6,8 dioxin, whereas the 2,4,5 isomer is needed to produce the 2,3,7,8 dioxin. The 2,4,5 trichlorophenol is not produced by the direct chlorination of phenol; it is manufactured by hydrolysis from tetrachlorobenzene.

We cannot say that there is no 2,4,5 isomer in the small trichlorophenol component of o-Chlorophenol Crude, but it is certainly not a major constituent. It follows, then, that the 2,3,7,8 tetrachloro dioxin, if present at all, would be only a small fraction of the total tetrachloro dioxins.

Finally, you requested a summary of the toxicity studies performed on o-Chlorophenol Crude. Dr. Paget will report these to you separately.

Sincerely,


J. S. Metcalf
Manager, Product Acceptability
Detergents & Phosphates Division

/dmw

Attachments

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Mr. Harry U. Gilmer

bcc: C. F. Callis
K. W. Easley
J. R. Foehr
J. T. Garrett
T. L. Gossage
B. G. Hammond
E. H. Harbison
E. L. Head
H. J. Horner/J.. Gloeckner
R. C. Isham/G. Young
G. J. Levinskas
D. T. Mayer
J. P. Mieure
D. E. Munie
R. S. Nelson/R. L. Liss
G. E. Paget
• W. B. Papageorge 
G. Roush
P. A. Tierney
J. L. Wolfsberger