Monsanto INDUSTRIAL CHEMICALS CO.

FROM (NAME & LOCATION) R. E. Keller - T1B

DATE : September 30, 1975

SUBJECT : CHLORINATED DIBENZOFURANS IN PCBs

REFERENCE : WBP 6/13/75 memo to REK et al

TO : W. B. Papageorge
B2SK

cc: H. S. Bergen - B2SL
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PCB Continuing plan

This memo summarizes progress on the action plan covered by the reference memo. All items below were targeted for completion by October 1.

1. Arrange for the preparation of the required furan standards.

   The following laboratory mixtures were prepared by Q. E. Thompson:

   (a) Mono-, di- and tri-chlorinated dibenzofurans;
   (b) Tri- and tetra-chlorinated dibenzofurans;
   (c) Penta-, hexa- and hepta'-chlorinated dibenzofurans.

   These mixtures have been characterized for the homologue composition by GC and GC/MS.

   Small quantities of the above mixtures were sent to R. Lidgett at Louvain-La-Neuve on 9-15-75 for method development work related to pentachlorophenol.

2. Refine analytical methodology to achieve detection levels of at least 0.1 ppm for each furan homologue.

   Our earlier methodology permits measurement of each chlorinated dibenzofuran isomer in PCB products as follows.

	Detection Limit
Tetra- through Hexachlorodibenzofurans	0.5 ppm (each component)
Mono- through Tri-Chlorinated Dibenzofuran	Unknown (>10 ppm)

   The goal for the above action was to develop a method with detection limit of 0.1 ppm for each of the above components.

   We have developed methodology over the past two months which is believed to have the necessary detection limit of 0.1 ppm for tetra- through hexachlorodibenzofurans. However, we have been unable to validate this detection limit because we find about 1 ppm total for those isomers in Aroclor 1254. We have been unable to develop improved methodology for measurement of mono- through tri-chlorinated dibenzofuran in Aroclor 1016 after several man months of effort. We have found that methodology reported by the FDA for these measurements cannot be reproduced in our laboratories. We have several more analytical schemes to try to resolve the above problems.

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3. Arrange with outside laboratory to confirm accuracy and reproducibility of methodology.

   No action on this since results have not been obtained yet for item 2 above.

4. Arrange with P. J. Marsh and R. A. Baxter for discussion with Bayer for possible mutual exchange of information relating to furan analyses.

   Contacts have been made with Monsanto-Europe. Most recent memo reply to REK from R. A. Baxter on 8-19-75 indicates that there will likely not be any information of significance coming from Bayer or Predelec.

5. Analyze Aroclor products produced at Sauget and Newport. Samples to include currently produced material as well as material produced prior to 1970.

   Materials have been received from both plants. Samples are being held until completion of item 2 above.

Overall, we have not yet achieved the total capabilities needed for determination of 0.1 ppm chlorinated dibenzofurans in PCB products. It is our understanding that justification for continuing this analytical research is based on showing that the level of chlorinated dibenzofurans is below toxicological significance (<0.1 ppm). Even though the odds of success are not high, we plan to continue with one additional man month of effort on this project. Recipients are asked to advise us if they are not in agreement.

REK

R. E. Keller

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