CUMMING-PATON

Monsanto

FROM (NAME & LOCATION) G. W. Miller - Anniston, Alabama

DATE : December 31, 1969

SUBJECT :

REFERENCE :

cc: J. C. Landwehr
H. L. Williams
V. R. Haupt
B. O. Severson

TO : A.W.M. Coaker - G.O.

Several samples of recently produced Aroclor 5060 and 5460 have been mailed to your attention, hopefully to provide some insight into the cause and extent of chlorinated biphenyl being present in our finished product. We have had several discussions with both technical and production people and only three ideas have been developed which can explain the phenomena. (1) Charge tank samples which are analyzed for biphenyl-terphenyl content are not representative and some biphenyl or chlorobiphenyl is added with the raw material or through a system therminol leak. (2) Charges containing recycled trappings from the off-gas collection tank are contaminated by some means with large amounts of biphenyl or chlorobiphenyl. (3) The suggestion which you proposed — Chlorobiphenyl is being produced in the chlorination mass by some mechanism which degrades or reforms terphenyl to biphenyl.

The samples mailed to your attention are as follows: Sample of charge tank for batch no. 32. This material is neat Santowax as received from the Santowax R storage tank. Samples 2 through 5 are partially chlorinated Santowax at 4,6,8,10 hours into chlorination. Sample 6 is a returned lot resulting from a recent quality complaint in which our customer complained that our product had poor flame resistance. This sample potentially may show the highest level of chlorobiphenyl we have yet seen. Sample 7 was produced on December 26 in our plant and was very unusual from the standpoint that the Santowax could not be chlorinated above 106° softening point. Subsequent investigation has brought us to the conclusion that the material was chlorinated in the absence of sufficient ferric chloride catalyst. Sample 8 should help to confirm this fact because it is a laboratory prepared chlorinated Santowax in which we know that the catalyst level was not sufficient.

Our thoughts so far are that the analytical results on these samples may give some insight into the following questions: (1) Is the charge tank sample truly representative of the charge to the chlorinators. (2) How does the biphenyl or chlorobiphenyl content increase within a given batch, assuming that it does increase for the particular batch we sampled. (3) Does there appear to be a significant increase at any particular point in a chlorination cycle of either biphenyl or chlorobiphenyl. (4) What are the relative rates of chlorination for a Santowax with a given biphenyl content. (5) Does this phenomena of chlorinating with insufficient catalyst produce biphenyl fragments. (6) Was the low flame retardance discussed in a recent complaint a result of high chlorobiphenyl levels.

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We anticipate your usual fine cooperation and wish to assist in speedy solution of this problem in any means possible.

G. W. Miller

GWM/bs

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