Monsanto INDUSTRIAL CHEMICALS CO.

FROM (NAME & LOCATION) D. R. Cova - T3C

DATE : April 9, 1973

SUBJECT : MONOCHLOROBIPHENYL FOR DOW

REFERENCE :

TO : J. R. Savage
B2SL

cc: J. K. Grant - 1740
R. M. Kountz - F4WA
A. E. Leisy - 1740
C. Paton - B2SC
W. R. Richard - T3A
J. F. Quinn - T3B

In your memo of March 30, 1973 you set out the monochlorobiphenyl composition desired by Dow. This was as follows:

Biphenyl	< 0.2%
Orthochlorobiphenyl	>80.0%
Metachlorobiphenyl	< 2.0%
Dichlors and higher	< 0.2%

These composition specs are tighter than the present MCS-1109 specs with respect to biphenyl, metachlorobiphenyl, and dichlors and higher. The last two specs concern me the most. MCS-1109 generally contains about 4% metachlorobiphenyl. Since metachlorobiphenyl boils between ortho- and para-chlorobiphenyl we cannot lower its content in distillate except by cutting the distillation short and leaving most of the parachlorobiphenyl in the stillpot residue. Two of the dichlorobiphenyl isomers (2,2'- and 2,6-dichlorobiphenyl) are very close boiling to parachlorobiphenyl. It will be very difficult, if not impossible, to separate these isomers from parachlorobiphenyl by fractionation. Once again, our only out to meet this spec may be to cut the distillation short and leave most of the parachlorobiphenyl behind. If we do this, the existing 30-tray column should be able to produce spec monochlorobiphenyl. However, we would be making about 120 lbs. of residue for each 100 lbs. of product. This is 70 to 80 lbs. more residue than normally made in the MCS-1109 process. A more lenient spec of 4-5% maximum on metachlorobiphenyl and 1% maximum on dichloros and higher would allow us to recover some of the parachlorobiphenyl and reduce the residue figure.

The addition of a biphenyl stripping column to the system would, as you stated, increase capacity. I estimate that a 45 actual tray column at a 4/1 reflux ratio would remove most of the biphenyl from the crude Aroclor. This assumes operation of the stripper in the continuous mode. Another means of getting some capacity increase would be to chlorinate to 11% chlorine instead of 5%. This would reduce the biphenyl forecut considerably (by a factor of 3 to 4) without increasing the stillpot residue.

DSW 297593

I would recommend some experimentation to see if a 60-tray column would do us any good on removing dichlors and higher.

D. R. Cova

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