**Monsanto**

FROM (NAME & LOCATION) V. R. Haupt

DATE : 14 Jan 70

SUBJECT : AROCLOR 5460 CHLORINATED BIPHENYL CONTENT

REFERENCE : Memo C. Paton to W. A. Kuhn 13 Oct. 69

TO : W. A. Kuhn

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Aroclor

There is an apparent discrepancy between the expected biphenyl content of Aroclor 5460 and the analytical value. An analysis of the Aroclor 5460 process shows that the PCB should be less than expected.

1. Chlorination temperatures are 190 - 250°C. Biphenyl boils at 255°C. and has a vapor pressure of 200 mm Hg at 200°C. Therefore, some biphenyl should be lost in the off-gas from the chlorinator.

2. Distillation conditions are 320 - 400°C. at 10-20 mm Hg absolute pressure. All chlorinated biphenyl will distill under these conditions. The condenser temperature is around 170°C. which will condense all biphenyl chlorinated above 42%. Therefore, some PCB is lost in the distillation step.

I know of no sure way to estimate the losses of biphenyl in the Aroclor 5460 process.

The PCB analysis method developed by Research cannot be proven out using plant made Aroclor 5460. Only 5460 spiked with known amounts of PCB should be used.

The conversion of biphenyl to higher polyphenyls seems unlikely at the temperatures and retention time during the chlorination step. Holding Santowax C at 370°C. for twelve hours did not decrease the biphenyl content.

Now that the corrosion test of NaOH plus 5060 on steel has proven successful, a Tentative Process Amendment to distill 5060 to 5460 with lime and NaOH will be applied for in the second quarter 1970.

V. R. Haupt

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