Monsanto

FROM (NAME & LOCATION): J. P. Mieure - Technology Department - South Second Street

DATE: November 10, 1970

SUBJECT: IMPURITIES IN SANTOWAX R

REFERENCE: JPM Memo to REK 10-20-70

TO: W. R. Richard
General Offices

cc: W. B. Papageorge - GO
J. R. Savage - JFQ
R. W. Weiss - GO
T. Bell - Anniston
E. P. Wheeler - GO
R. E. Keller - Res. 1
M. W. Dietrich - Res. 2
→ E. S. Tucker - Res. 2
R. H. Munch - Res. 2

Recent work covered by the reference memo shows the presence of polychlorinated anthracene or phenanthrene and possibly tetrachlorodibenzofuran in Aroclor 5442. This work was extended to cover analysis of Santowax R, lot 1-00, sent by Dick Weiss. GC/MS was performed to determine if the unchlorinated analogs exist in this starting material for Aroclor 5442. This memo reports results of this analysis.

The Santowax R is primarily o-, m-, and p-terphenyl, with lesser amounts of the six possible quaterphenyls. Several other impurities were tentatively identified and measured, as indicated in the following table. (The peak numbers refer to the attached chromatogram.)

| Peak No. | Identification | Typical Percentages (Estimated) |
|---|---|---|
| 1 | biphenyl | 0.1-0.8 |
| 2 | methyl biphenyls | 0.003-0.02 |
| 3 | fluorene or benzonaphthene | 0.01-0.05 |
| 4 | anthracene and phenanthrene | 0.04-0.3 |
| 5 | o-terphenyl | 7-9 |
| 6 | phenyl naphthalene | 0.04-0.1 |
| 7 | m-terphenyl | 45-50 |
| 8 | p-terphenyl | 30-33 |
| 9 | quaterphenyl | 0.2-0.3 |
| 10 | 4 fused rings e.g. naphthacene, chrysene, or triphenylene | 0.7-0.9 |
| 11 | quaterphenyl | 1.6-2.1 |
| 12 | quaterphenyl | 1.5-2.0 |
| 13 | quaterphenyl | 0.4-0.6 |
| 14 | quaterphenyl | 2.5-3.2 |
| 15 | quaterphenyl | 2.4-2.8 |
| 16 | pentaphenyl (5 ring analog to quaterphenyl) | 0.6-0.9 |

A GC method, based on these peak identifications, could be set up at Anniston to monitor these impurities in different lots of Santowax R.

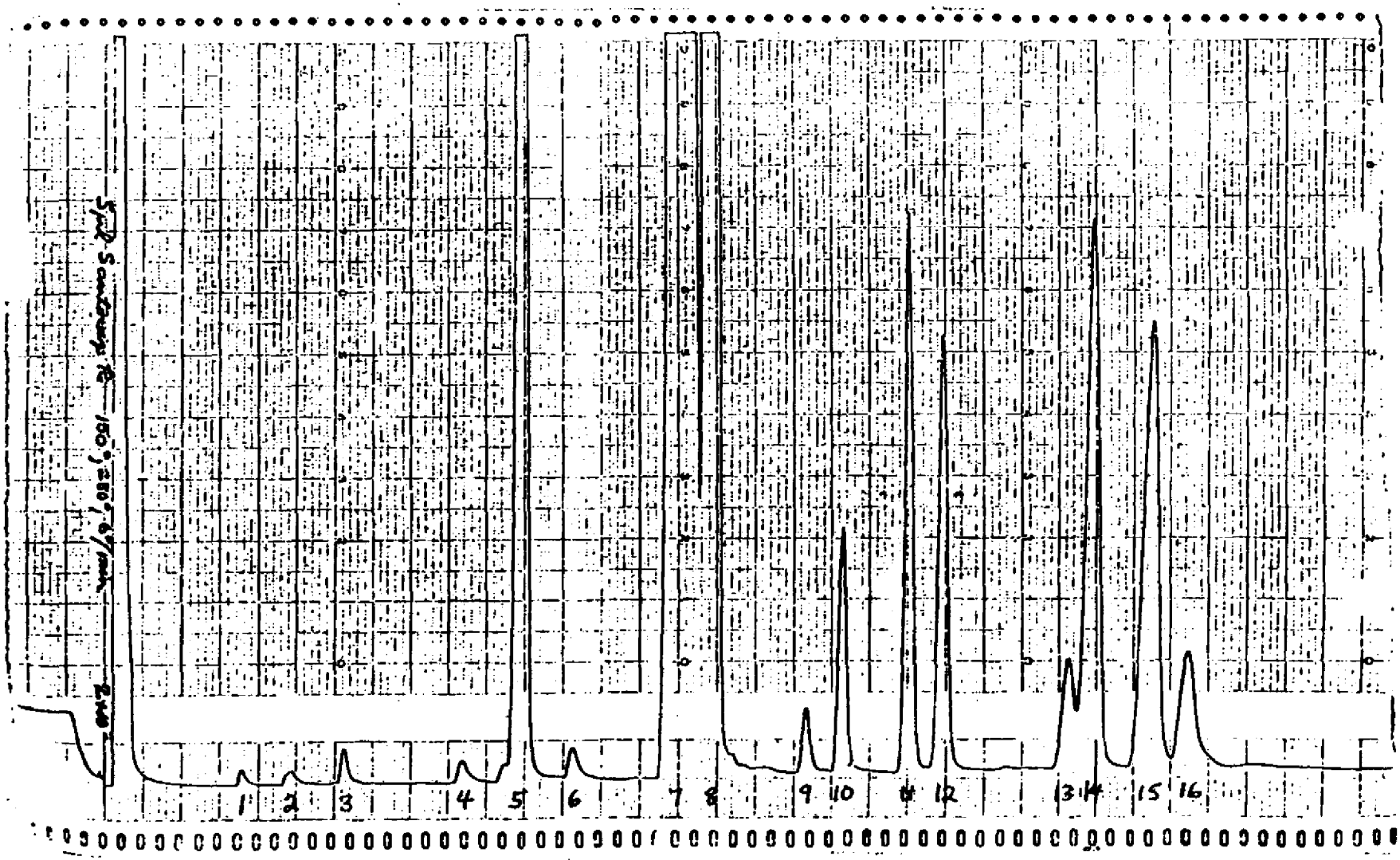
Additional work has shown that a positive identification of tetrachlorodibenzofuran in Aroclor 5442 has not been necessarily made. Under the conditions of the experiment it is not possible to distinguish tetrachlorodibenzofuran from tetrachloromethylbiphenyl.

This is particularly true if the methyl side chain is partially chlorinated. Accordingly, research plans should not be made on the basis that tetrachlorodibenzofuran is the contaminant. An adequate method for ppm levels of dibenzofuran in Santowax R is not yet available. Since methylbiphenyl has been found in Santowax R, it is possible that it is chlorinated methylbiphenyl, and not chlorinated dibenzofuran in Aroclor 5442. Work is in progress to determine which species is in the Aroclor 5442.

J. P. Mieure

db
Attachment

CHROMATOGRAM OF SANTOWAX R




MONS 202063