[ ] R 28 (rev. 11/53)

# PROGRESS REPORT

ORGANIC CHEMICALS DIVISION

St. Louis Research Department

Job No. 117-2681
Report No. (6)

Reported By: A. M. Ellenburg

Date: June 30, 1954

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| At St. Louis | At St. Louis | At WGK Plant | 35- G. R. Buchanan - KXOK-2 |
|---|---|---|---|
| | | 25-29- | 36- |
| 1 Library | 13 R.O. Nellums | 30 Development | 37- |
| 1a Library | 14 O.J. Weinkauff | | 38- |
| 2 D.M. Campbell | 15 J.R. Wilson | At J.F.Q. Plant | 39- FILE NO. 246.640.1 |
| 3 H.W. Faust | 16 F.B. Zienty | | 40- |
| 4 L.L. Fellinger | 17 O. DeGarmo | 31- | 41- TECHNICAL SERVICES |
| 5 H.R. Gamrath | 18 J F Q Development | | 42- CHEMICAL ENGINEERING DEPT. |
| 6 R.M.Hitchens | 19 J.R. Durland | At Nitro | 43- PERMANENT [ ] |
| 7 C.A. Hochwalt | 20 R. M. Morris | 32-W.P. Metzner | 44- |
| 8 R.E. Howard | 21 J. H. Lum | | 45- THEREAFTER 6 MONTHS. |
| 9 D. S. Weddell | 22 P.G. Marsh | At Dayton | 46- SEE ALSO |
| 10 R.H. Munch | 23 J. L. Hammer | 33 L. Lederman | 47- |
| 11 F.M. Murdock | 24 B.E. Thomas | 34 N.N.T. Samaras | 48- |
| 12 H.K. Nason | | | 49- |

Title: ASSISTANCE TO SALES AND DEVELOPMENT DEPARTMENTS ON AROCLOR AND BIPHENYL DERIVATIVES

Problem: To answer requests of Sales by supplying data and samples for specific inquiries.

Summary: Viscosity measurements on the Aroclor 1248 samples used as a heating medium at 650°F. for 678 hours showed a slow increase in viscosity at this temperature.

2. At the request of Sangamo Electric Company a sample of Aroclor 1242 was upgraded in our laboratory by our standard practice after they had been unsuccessful. A sample of our attapulgus earth was sent to them for trial in their laboratory.

3. Two odor maskants were submitted by Polak and Schwartz, Inc., New York for masking the odor of Aroclor 1242. A panel of nine people expressed the opinion that the Aroclor was less objectionable than when the maskants were added.

4. One company reported that a mixture of 95% Aroclor 1260 and 5% antimony oxide had shown unexpected results when heated at 250°F. A purple color was obtained in the Aroclor with the evolution of



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gas and a noticeable decrease in viscosity. No explanation is offered for this observation unless the mixture was overheated considerably above the 250°F.

Details:

1. The analyses on the Aroclor heater samples from International Boiler Works Company, East Stroudsburg, Pennsylvania indicate a slow increase in viscosity when heated at 650°F. and 125 psig pressure.

| | Hrs. Operation | Sp. Gr. at 65/15.5°C. | Viscosity at 130°F. |
|---|---|---|---|
| Initial Sample | 18 | 1.407 | 74.6 seconds |
| Sample No. 1 | 174 | 1.407 | 77.7 |
| Sample No. 2 | 342 | 1.408 | 81.9 |
| Sample No. 3 | 510 | 1.410 | 87.2 |
| Sample No. 4 | 678 | 1.409 | 94.7 |

At 650°F., some breakdown of the Aroclor occurs with polymerization to give increased viscosity. The increase in viscosity is slow enough to allow long use at 650°F. before discarding the Aroclor. At 600°F., no change in viscosity is noticed after 670 hours of operation.

This joint work with International Boiler Works has been in progress for about 18 months and included six tests similar to the above.

2. Sangamo Electric Company at Marion, Illinois has begun studies on Aroclor 1242 for capacitor impregnation. Their laboratory could not increase the resistivity of the Aroclor 1242 above $200 \times 10^9$ ohm-cm. at 100°C. from the original resistivity of $100 \times 10^9$ ohm-cm.

After receiving a sample of their Aroclor 1242, the low resistivity was confirmed. After stirring at 70°C. for 2 1/2 hours with 0.1% attapulgus earth and then filtering out the earth, the Aroclor has a resistivity of $4100 \times 10^9$ ohm-cm. at 100°C. With 0.5% earth treatment, the resistivity measured $18{,}000 \times 10^9$ ohm-cm. at 100°C.

Our results were sent to Sangamo along with a sample of the earth used here. Tests at their laboratory with our earth should show some improvement in resistivities. Our method of cleaning test cells and apparatus was also sent to Sangamo.

3. Odormasque Nos. 1004 and 1066 were submitted to us by Polak and Schwartz, Inc. of New York with suggested concentrations for masking the odor of Aroclor 1242.



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Seven of a nine-membered panel selected Aroclor 1242 with no additive as the least objectionable. Samples containing the Odormasques gave an aroma which drowned the Aroclor odor and which was considered more disturbing than the Aroclor 1242. Odormasque No. 1004 had a camphor odor which was less pleasing than No. 1066 which imparted a citrus odor.

4. Detro Manufacturing Company of Culver City, California reported gas evolution and a decrease in viscosity of Aroclor 1260 with the formation of a purple color when a mixture of 95% Aroclor 1260 and 5% SbO was heated at 250°F.

This mixture has been used in flameproofing textiles, but it is unsatisfactory because of the stableness of the Aroclor. The chlorinated biphenyls do not release HCl rapidly enough to retard burning. No explanation is offered for the observations reported unless the temperature was considerably higher than 250°F.

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