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W. B. PAPAGEORGE - ST. LOUIS

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AROCLOR ENVIRONMENTAL PROGRAM

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I apologize for the delay regarding comments on the questions in your memo dated December 29, 1969. The PCB "learning process", although not completed, has taken longer than I had anticipated.

Waste Handling - U. S. Plants

Both the Anniston and W. G. Krummrich plants have become more aware of the need to reduce the amount of Aroclors in the plant effluents to essentially zero. Lacking any positive guidelines, we have tentatively selected a target of 10 ppb. Both plants have monitored their streams to determine current levels of PCB presence and have active programs to reduce leaks, spills and deliberate dumping. No major capital expenditures are planned at this time. The Anniston plant plans to install a dump in their sewer system to trap Aroclors. All waste containing PCB's is at present hauled to the dumps the plants have been using for other plant waste. We recognize this is not the ultimate, since PCB's could eventually enter the environment, but we will continue this practice until better methods of disposal are available. I have arranged with the plants to send reports of the status of these activities to you through Dom Danna. A copy of the analytical procedure we are using is attached.

Aroclor 5460

We do not know what happens to Aroclor 5460. No one has reported its presence in samples of water or wildlife. We are assuming that its low solubility may preclude its free movement in the environment. Some questions have been raised concerning the ability of current analytical techniques to discern its presence.

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Aroclor 1254 and Aroclor 1260

Our original plans to move toward discontinuance of 1254 and 1260 were primarily based on the information available which indicated the chlorinated biphenyls with 5 and 6 chlorines were the type consistently found in the environment and considered to be harmful. During a recent meeting with representatives of General Electric, this decision to discontinue 1254 and 1260 was challenged. The G.E. representatives believe that the benefits of these Aroclors in transformers far outweighs the yet questionable threat to the environment. It appears that in those situations where control is practical, such as transformer usage, we could continue to supply Aroclor 1254 and 1260. We plan to take this position in our next review with the Corporate Management Committee.

NCR Paper

The presence of PCB in NCR paper poses a particular challenge. The ultimate destination of this product is difficult to control. Normal incineration vaporizes the Aroclor which eventually is found somewhere in the environment. The NCR people, both in the U.S. and U.K. have been looking for a substitute for Aroclor 1242 for several reasons. The PCB threat has accelerated this desire to convert. In the U.K. arrangements have been made to test HB-40 as an alternate. At this time, there appears to be some optimism that the tests will be successful. In the U.S., with a slightly different process, the HB-40 is not considered an adequate substitute. NCR-U.S. is evaluating alkylated biphenyls as possible substitutes.

Aroclor Toxicity - Anniston Plant

Your question as to why the toxicity of Aroclors has not turned up downstream of the Anniston Plant after 40 years of manufacture is difficult to answer. We just don't know. Aroclors have been found in Snow Creek near the plant. There is no record of any water life observed in this creek for many years. We've assumed other plant wastes were to blame; e.g. muriatic acid. Aroclors could be involved also.

Biodegradability

Tests on the biodegradability of Aroclors are being conducted both in St. Louis Research and at Ruabon. At present, Aroclor 1221 appears biodegradable in river water and activated sludge. Aroclor 1242 undergoes slight degradation in sludge containing microorganisms acclimated to biphenyl. All other Aroclors have resisted biological degradation, to date. There is some indication that isomer structure determines ease of degradation.

Incineration

Aroclors will decompose at temperatures exceeding 800°F. Bayer and Prodelec in Europe claim they are incinerating PCB's. We have been promised data on the stack gases formed. The Rollins-Purle, Inc. people in New Jersey claim that they incinerated some Aroclor 1254. We have some doubts about the degree of destruction achieved and we plan to pursue further. We have made arrangements for testing at the John Zink Company: Tulsa, Oklahoma for the week of March 9. Our objective is to get incineration data which we can use to 1) evaluate commercial incinerators, 2) design plant incineration systems or, 3) provide to our customers to help them with their disposal problems.

Toxicity

Studies are being conducted for Monsanto by the Industrial Bio-Test Laboratories outside of Chicago. The effects of Aroclor 1221, 1242 and 1260 on rats, dogs and chickens are being observed. The results, so far, have been inconclusive.

We are retesting and extending some tests to confirm the initial results.

Waste Treatment

Studies on the removal of Aroclors in solution or emulsified in water are being conducted. Anniston is studying the removal by carbon. MRC, Dayton, is studying the removal on acid clays. Once we have successfully removed the PCB from solution, we plan to develop means for complete destruction of the PCB on the carbon or clay.

As you can see, there are many areas with unanswered questions. Much of our effort at this time is being expended on activities aimed at providing us with more information. As the results become available, we will forward them to you.

W. B. PAPAGEORGE

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Attachments