Monsanto

FROM (NAME & LOCATION): W. B. PAPAGEORGE - ST. LOUIS

DATE: JULY 17, 1970

SUBJECT:

REFERENCE:

TO: H. S. BERGEN

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I reviewed our biodegradation studies with R. Munch, R. Kountz, S. Tucker, E. Emery and J. Savage on Thursday, July 16, 1970.

1. Monsanto-USA Studies

River die-away studies indicated Aroclor 1221 disappears, Aroclors 1242, 1248 and 1254 were undegraded.

Semi-continuous activated sludge studies indicate that selective degradation of specific homologs does occur because peaks normally present in Aroclor 1221, 1242 and 1248 disappear.

2. Monsanto-U.K. Studies

Shake flask studies demonstrate that 2,4'-, 2,2,3- and 2,3,4'- isomers degrade readily. 2,2',4,6-, 2,2',4,4', and 4,4' do not degrade.

Ruabon laboratory also demonstrated by peak analysis that MCS-1016 and Aroclor 1130 are more degradable than Aroclor 1242.

3. Environment Samples

Investigators in both Europe and USA find isomers in wildlife that resemble those in Aroclor 1254. Predominant homologs present in Aroclor 1242 are usually not found except close to industrial plants. Since large quantities of Aroclor 1242 are produced and released to the environment, degradation must be occurring.

Evidence of degradation has been noted by Monsanto laboratory in studies of foundry plant settling ponds, milk and fish. Peaks which are present in the original Aroclor are modified or missing in the sample extract indicating degradation.

4. MCS-1016

Considerable discussion was held on what is meant by "biodegradable" when describing MCS-1016. Capacitor customers I visited had the erroneous impression that this meant the material could be introduced into the plant sewer system and would be non-detectable a very short distance downstream. For our purposes, the term "biodegradable" means that peaks which persisted through the biodegradation tests with Aroclor 1242 are significantly reduced in this distilled product. Neither Aroclor 1242 or MCS-1016 can be dumped into the environment. Users of either material must exercise control. In some instances this may require activated sludge treatment units. It is generally agreed that the relative improvement in biodegradability is an advantage which the capacitor industry will find interesting. We must establish if the less controllable hydraulic fluids applications can materially benefit from the use of MCS-1016.

5. Current Work

At Ruabon, work continues on HB-40, Aroclors and Pyralene 1500 (a competitive product). Dr. W. C. Evans, University of North Wales, Bangor is investigating some microorganisms which he believes are effective on PCB's.

E. Emery is completing his studies on HB-40 and MIPB. He will immediately start tests to determine relative per cent degradation of Aroclor 1242, Aroclor 1254, MCS-1016 and Aroclor 1230B. These tests take about 3 weeks to complete and his equipment provides for testing four products at a time. Analytical facilities are manned 7 days per week, 12 hours per day. Equipment needs are being evaluated.

The backlog of products to be tested continues to increase. The Applied Sciences Group continually reviews the list to re-establish continuing changes in priorities.

In summary, emphasis on this work has been accelerated within the past three months, the work is progressing as planned and our facilities are being utilized to the practical limit.

W. B. PAPAGEORGE

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