Monsanto INDUSTRIAL CHEMICALS COMPANY

FROM (NAME & LOCATION) E. S. Tucker - South Second Street - St. Louis

DATE November 3, 1971

SUBJECT MCS 1109

REFERENCE C. Paton's 9/27/71 Memo to WRR

TO W. R. Richard
General Offices

cc: T. L. Gossage - GO
W. S. Clark/R. N. Brell - GO
D. R. Pogue - GO
Q. E. Thompson - GO
W. B. Papageorge - GO
—>R. E. Keller - Res. 1

1. Organ Accumulation as a Result of Feeding

We currently do not have any experimental data regarding the accumulation of this material in the organs of any laboratory test animals. However, we have data on the accumulation of some of the more highly chlorinated PCB's (Aroclor 1242, Aroclor 1254 and Aroclor 1260). Based upon this information, some rough maximum estimates of the rate of accumulation for MCS 1109 can be made, assuming that the rate of accumulation is a linear function with respect to the degree of chlorination of the product.

The theoretical rate curve, as a function of exposure period at feed levels of 1, 10, and 100 ppm, is shown in Figure I. Each data point represents the average PCB storage level which theoretically would be found in muscle, fat and liver on a lipid weight basis. The Aroclor 1242 curves, shown in Figure II, are constructed from real data points and are included for reference purposes.

In actuality, the PCB storage level is not a linear function of the degree of chlorination and as such even lower values might be expected.

MCS 1109 is currently being fed to laboratory animals and tissues are being retained for subsequent analysis.

2. Metabolism

We have not carried out metabolic studies with any of our PCB products, nor am I aware of any plans to do so. However, since MCS 1109 is so close to biphenyl, I do not think it unreasonable to assume that it would be metabolized in a manner closely related to that observed for biphenyl itself. A schematic summary of the results of a study of the metabolic fate of biphenyl fed to rats is shown in Figure III. Undoubtedly, some of the original biphenyl is also excreted unaltered.

3. Biodegradation (SCAS/RDA)

Again, we have not studied the bacterial degradation of MCS 1109 by either of these techniques. It is scheduled to be tested via the SCAS but no plans have been made to look at it via the RDA test.

Based upon the data we have gathered to date on the other Aroclor products, it can probably be stated with a fair amount of certainty that this product would be classified in either the Partially Biodegradable I (50%-90%) class or the Biodegradable class. Figure IV shows the trend observed when the SCAS disappearance rates, so far measured, are plotted as a function of the % chlorine present in the product. On this basis, MCS 1109 should fall somewhere between Aroclor 1221 and biphenyl, supporting the above statement.

Aroclor 1221 also showed evidence of degradation when exposed to river water while Aroclor 1242 did not. MCS 1109 again should show greater evidence of RDA degradation than Aroclor 1221.

Cumming also asks if MCS's have been observed in environmental samples and indicates that it might be a good thing to report results as % di, % tri, % tetra, etc.

In answer to his first question, I can say that in "weathered" biological residues, we have never seen MCB nor have any of the other workers to the best of our knowledge.

In a manner of speaking, we always have reported "qualitatively" the homologs which are present in the residues. If a residue is reported as Aroclor 1242 or Aroclor 1254, it means just that, i.e., that the dominant homologs observed were di, tri, and tetra or tetra, penta, and hexa. In order to report these as actual percentages, one would need to know which specific isomers were in each peak (packed columns do not yield complete resolution) and a responce factor for each individual isomer.

E. S. Tucker

db
Attach. - 4