

AROCLOR DEFENSE (EST)

PCB, chloride, chlorine and total organic chlorine analysis of the gas samples collected during the thermal oxidation studies at the John Zink Co. established that Aroclor 1242, Inerteen PPO, and Aroclor 1260 can be successfully disposed of in this manner. The preliminary data has been sent to CRD and a report is being issued.

Sixteen sediment and water samples have been received from W GK for PCB analysis. Their analysis will be completed by May 15. The W GK analytical laboratory has ordered the necessary gear which will allow them to do their own PCB analysis and are scheduled to be on stream by July 1. Along these lines we will familiarize one of their personnel with the required techniques during the month of May.

Two 7-lb Mississippi River carp have also been supplied to us by W GK and are being prepared for PCB analysis. Samples of these fish will be returned to W GK for mercury analysis. It is also planned to examine the carp extracts by GC/Mass to see what others chemical residues can be observed.

Water and sediment samples from six accounts employing Pydraul fluids have been analyzed for PCB's. The results indicate that all plants are discharging low ppb to high ppm amounts of PCB's to associated sewers, streams, and lakes. The companies so far monitored all Johnson Motors (Waukegan, Ill.), Lester Castings (Bedford, Ohio), Central Diecasting (Chicago, Ill.), Wheeling-Pittsburgh Steel (Steubenville, Ohio), Wisconsin Steel (Chicago, Ill), and Timken Steel (Canton, Ohio). This information is being generated to help guide a potential recovery and recycle program evaluation by Fluids' Marketing.

Muratic acid (HCl) from Monsanto Central Drumming has been analyzed by EC/GC for PCB's. Low levels of compounds having similar retention times to the lighter chlorinated biphenyls were observed. A larger sample has been extracted for GC/Mass confirmation of the suspicioned presence of PCB's. Two other products, food grade fumaric acid and saccharin are also presently being analyzed for PCB contamination. These results should be available early this month. If positive, no doubt, other products will have to be examined closely.

GC/Mass and EC/GC analysis of silo paint scrapings and raw milk extracts submitted to us by the State of Ohio, Dept. of Agriculture, Foods, Dairies and Drugs Laboratory confirmed the presence of PCB's in these materials. The silo scrapings contained 2.87% unaltered Aroclor 1254, the raw milk extracts contained an estimated PCB level of 0.6-0.7 ppm. Although the isomer distribution of the PCB's in the milk was altered with respect to Aroclor 1254, the isomers present were those that occur predominately in Aroclor 1254. Strikingly similar isomer alterations have been observed earlier in the electron capture chromatograms of an extract of a human fat biopsy sample, supplied to us by WARF Institute and in extracts of

raw milk samples supplied to us by the Maryland Cooperative Milk Producers. Both organizations had suspicioned PCB contamination; unfortunately, in both cases GC/Mass confirmation could not be obtained because of the limited amount of sample available (WARP) or the low level of contamination (MCMP).

The Bio-Test Laboratories has been contacted to arrange for the transfer of the tissues from various feeding studies they have conducted for PCB residue analysis. A rough estimate from them indicates that they have approximately 1000 cu. ft. of freezer space that is now filled. For this reason it was requested that a laundry list be prepared so that selected samples could be sent. We presently have only about 30 cu. ft. of storage space in St. Louis and see no reason to duplicate their facilities.

Air samples from the Appleton Coated Paper Co., Appleton, Wis. have been received and analyzed for PCB's. Low levels were detected, but the amounts present in terms of mg/ms cannot be calculated until the actual number of liters of air passed through the scrubbers is obtained from them. If their sample sizes were on the order of 100 l. or more, the calculated amounts will probably be less than the recommended "safe" level.

An informational PCB problem review of the analytical methods and the data so far generated was held for representatives from Westinghouse.

A first quarter report has been written reviewing the results of the preliminary river die away and some continuous activated sludge degradation of Aroclor 1221, 1242, 1248, 1254, and Aroclor 1228. In brief, the results were as follows, the only Aroclor which was degraded to any extent in the river die away experiments was Aroclor 1221.

Isomer alterations accompanied by the disappearance of 0.3-1.0 mg per 24 hr. periods were observed with all Aroclors (compared to 20 mg of LAS Dodecene-1 which is consumed in 24 hrs) feed to the semi-continuous activated sludge units. The actual interpretation of this data awaits the evaluation of non-biodegradation routes which could account for the bulk of the Aroclor lost. This experiment is currently in progress.

In the past these experiments (adsorption, volatilization, etc.) have been hampered considerably by our inability to analyze the large number of samples required to obtain enough data points to compensate for the large variance generally encountered in biological experiments. In the future, this should be compensated for by the additional manpower which has been assigned to this portion of the project. The Physical Chemistry Group is currently setting up the necessary equipment to carry out biodegradation studies on Aroclors and Aroclor replacement products.