Mammalian, Avian and Aquatic Polychlorinated Biphenyl Residue Studies

Upon confirmation of polychlorinated [illegible] (PCBs) as environmental residues [illegible] Lab-Test Laboratories, Inc. and [illegible], Inc. were instructed by Monsanto, Co. to initiate a number of [illegible] toxicity studies.(6) The primary [illegible] of these studies was to obtain [illegible] information about the toxicity [illegible] Monsanto PCB products upon [illegible] a more quantitative assessment [illegible] potential environmental impact [illegible] be made.

MONS 048136

Secondary objectives of these laboratory studies were to determine the relationship between tissue storage levels and exposure level, [illegible], the degree of elimination of the product [illegible] as well as residue re-mobilization

and the character of the PCB residues retained via selective absorption and/or metabolism.

~~The results were viewed via selective absorption and/or metabolism.~~

No attempt will be made in this appendix to correlate toxicity responses with observed tissue storage levels (see appendix — for toxicity results).

All tissues collected from the various studies were excised, packaged, quick frozen, and shipped to Monsanto, Co. for PCB analysis. Upon receipt the tissues were analyzed as outlined in Analytical Chemistry Method 71-35.

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With the first two studies all tissues collected were analyzed for PCBs. On all subsequent studies muscle,

large numbers of samples a statistical approach was employed to minimize both analytical time and manpower expenditures. This approach involved the analyses of a balanced subset (~25-30%) of the tissues collected for PCB residues. The PCB residue data along with the appropriate variables (tissue, exposure level, exposure period, sex, and the PCB product fed) and the most probable variable interactions were then employed to generate a predicting equation via multiple regression analysis. The initial equation was seldom satisfactory for predicting the PCB residues in the tissues not analyzed. The equation was then refined by deleting those data which were more than two standard deviations

from the predicted equations and those variables interaction terms which were not significant at the 95% confidence level. The refined equation was then used to calculate the PCB residue levels in all tissues for the study in question.

The validity of each of the predicting equations developed in this manner was established by comparing the respective residual standard deviations with the residue standard deviations of the equations obtained for the studies in which all of the samples were analysed. The 95% confidence limits for these studies, calculated from the log of the residual standard deviations, were in the range of

MONS 048139

0.5 to 2 times the predicted values through the observed range may at first glance appear unrealistic to the un-initiated, it can be easily substantiated that this amount of variation is realistic. Especially if one considers that these studies were a cooperative effort between several laboratories, involving many people and of course the usual amount of logistic and communication problems as well as the variation normally associated with biological studies and any complex analytical methodology.

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Summary

The most significant conclusion which can be drawn from the residue data is that it supports what has been and is being observed in the environment. That is to say that from a residue viewpoint the bulk of the PCB (those isomers containing 4 or less chlorines) released to the environment have not concentrated as one moves upward through the food chain and as such they do not represent a potential long term threat to the higher members of the food chain.

More specifically it was observed that the PCB residue storage levels decrease exponentially as the degree of chlorination of the product fed decreases. This is illustrated graphically in figure 11 in which the observed PCB residues (ppm in lipid) is plotted versus the % (w/w) chlorine present in the product fed to

MONS 048141

Considerable differences were noted in concentration factors

rats and dogs at the 100ppm level for three months. as judged by ratioing the concentration of the PCB level found in the extractable lipid to the exposure level. Fish were found to be the most efficient PCB concentrators followed by chickens, rats, and dogs. The actual concentration ratios for Aroclor 1242 at the lowest exposure level studied are shown in table VI.

TABLE VI

(ppm) Exposure Level	Exposure Period	Maximum PCB Level Found in lipid	* Ratio (col 3)/(col 1)
Blue gills	0.1	21 days	4.0 %	~400,000
Pit fish	0.1	" "	3.2 %	~300,000
Chickens	1.0	12 weeks	20 ppm	20
Rats	1.0	2 years	9 ppm	9
Dogs	1.0	2 years	2 ppm	2

* Note: ratio does not take into account exposure period.

Calculation of concentration ratios in this fashion for chickens, rats, and dogs can be mis-leading. For example,

MONS 048142

the ratios of the total PCBs retained by beagle dogs to the total consumed over a two year period are shown in table VII for Aroclor 1242 at three exposure levels. It becomes at once evident

Table VII

Exposure Level	1 ppm	10 ppm	100 ppm
Ratio (retained/consumed)	0.005	0.001	0.0003

after inspecting the table that large mammals are in fact inefficient PCB concentrators.

[illegible]

The following studies initiated by Monsanto [illegible] - out by Industrial Biotest [illegible] and Monsanto are included in this summary.

IBT B7007	30-Day Tissue Collection Study In Albino Rats with Aroclors
IBT B7298	Two-Year Chronic Oral Toxicity Study of: Aroclor 1242, Aroclor 1254, Aroclor 1260 in Albino Rats
IBT P7297	Three-Generation Reproduction Study in Albino Rats with: Aroclor 1242, Aroclor 1254, Aroclor 1260
IBT 9888 C 9888 D	90-Day Subacute Oral Toxicity Study of: Aroclor 1016, Aroclor 1221 in Albino Rats
IBT C7299	Two-Year Chronic Oral Toxicity Study of: Aroclor 1242, Aroclor 1254, Aroclor 1260 in Beagle Dogs.
IBT 9887 9885	90-Day Subacute Oral Toxicity Study of Aroclor 1016, Aroclor 1221 in Beagle Dogs
IBT J7300	Toxicity, Reproduction and Residue Study of: Aroclor 1242, Aroclor 1254, Aroclor 1260 in White Leghorn Chickens

IBT 8746 Toxicity, Reproduction and Residue Study of Aroclor 1242, Lot #AK-255 in White Leghorn Chickens

The following study was carried out at Biometrics Dept. of Wareham, Massachusetts.

Acute Toxicity of Aroclor 1016, Aroclor 1242, and DDT to Bluegill and Channel Catfish During 21 Days Continuous Exposure to the Chemicals in Water

At the end of the exposure period the tissues were excised, packaged and quickly frozen for shipment to Monsanto, St Louis, for analysis. Upon receipt, the tissues were analyzed as outlined in Analytical

The method involves isolation of the PCB's by solvent extraction, chemical and alumina column clean-up of the extract, followed by detection of the type and level of PCB's retained in the tissues by electron capture gas chromatography (EC/GC).

The large number of samples (~800) and hence time and money needed for analysis of the complete set of samples prompted a re-evaluation of the residue analysis work. It was decided that a reduction in cost could be obtained with little loss in information by analyzing only a balanced subset of the samples. All of the PCB

MONS 048145

IBT 8746 Toxicity, Reproduction and Residue Study of Aroclor 1242, Lot #AK-255 in White Leghorn Chickens

The following study was carried-out at Bionomics Inc. of Wareham, Massachusetts.

Acute Toxicity of Aroclor 1016, Aroclor 1242, and DDT to Bluegill and Channel Catfish During 21 Days Continuous Exposure to the Chemicals in Water

At the end of the exposure period the tissues were excised, packaged and quick frozen for shipment for analysis. [illegible] St Louis [illegible] the tissues [illegible] Chemistry Method #71-35. Early in the program, the large number of samples (~800) and hence time and money needed for analysis of the complete set of samples prompted a re-evaluation of the residue analysis work. It was decided that a reduction in cost could be obtained with little loss in information by analyzing only a balanced subset of the samples. All of the PCB

MONS 048146

[illegible] found in the earlier analysis
along with the five variables and
their possible interactions were entered into
the multiple regression program. The first pass
seldom yielded a satisfactory equation for
predicting PCB residues. The data were
then smoothed by dropping those results
which were more than two standard deviations
from the predicted PCB residue. In addition
the interactions which were less than 95%
significant were dropped. On the second pass
this treatment
yielded appropriate equations for predicting the
PCB residues in the samples which were not analyzed.
Another criterion used to judge the MONS 048147
suitability of the predicting equations was
the residual standard deviation. The standard
deviations for the partial analysis cases were
compared with the complete analysis case
(two years not studied) and were found to be the same
[illegible].

[illegible] confidence limits encountered with these [illegible] were approximately 50% to 700% of the values [illegible] predicted PCB tables.
The regression equations used to predict the PCB residues are shown on the tables of predicted ~~values~~ results.

The purposes of these studies were twofold; to gather toxicity data on the Aroclors, and to ~~[illegible]~~ measure the PCB residues retained in ~~the~~ tissues of animals fed Aroclor.

~~These studies were designed to answer two needs; first to gather the need for toxicity data on the Aroclors, and second to gather the need for residue analysis data on the Aroclors.~~ This report will be confined to the analysis of the tissues for PCB residues. The toxicity data is covered in ~~the~~ Industrial Biotest Laboratories' final reports bearing the titles ~~for the studies~~ listed above.

Summary

MONS 048148

Summary

During all of the short term studies the PCB residue level found increased as the exposure level increased. With the long term rat study the PCB residue level appeared to plateau at some point after 3 months for Aroclor 1242 at all exposure levels and Aroclor 1260 at the 1 ppm exposure level.

The PCB residue level found increased as the degree of chlorination increased.

The PCB residue levels found were significantly lower in the animals placed on a recovery diet (no test material).

MONS 048149

With one exception alterations of the homolog distributions of all products fed were observed. The exception was the fish samples where the PCB levels found (too low?) precluded the observation

of any changes in the homolog distribution. The amount ~~extent~~ of the alterations ~~observed~~ depended on species and on the Aroclor fed. The alterations were most extensive in mammals and increased as the size of the animal increased. Although the alterations were less extensive with the members of the avian community, they were observed in all tissues, with all products fed, at all exposure levels. Over all the alterations were greatest with Aroclor 1221 and least with Aroclor 1260.

) 30 day Tissue Collection Study In Albino Rats with [illegible]

Tissues were fed Aroclor 1242, Aroclor 1254 and Aroclor 1260 at 300 and 1000 ppm for a period of thirty days. Muscle, kidney, liver and fat samples were excised for analysis. With these samples the alumina columns clean-up procedure was sufficient to remove any interferences to the quantitation of the PCB residues on the EC/GC. The PCB residues ~~found~~ calculated on a wet tissue weight basis are shown in table I. The corresponding results calculated on a hexane soluble lipid weight are shown in Table II.

MONS 048151

The results of this study demonstrate that the residual PCB levels in all tissues decreased significantly as the degree of chlorination and the exposure level decreased. Alteration of the homolog distribution

of all products was also observed. The [illegible] was greatest for Aroclor 1242 and least for Aroclor 1254 and Aroclor 1260.

3) Two-Year Chronic Oral Toxicity Study of Aroclor 1242, Aroclor 1254, Aroclor 1260 in Albino Rats

The rats were exposed to the Aroclors at 1, 10, and 100 ppm in the diet for a period of twenty-four months. Animals were sacrificed and tissues were retained for residue analysis at 3, 6, 12, and 24 months. All of the muscle, liver, and fat tissues were analyzed with the exception of those from the six month sacrifice. As with the 30 day study, the alumina column clean-up procedure alone was sufficient to remove any interferences to the quantitation of the PCB residues.

The PCB residues calculated on a wet tissue weight basis are shown in Table III. The corresponding results calculated on a lipid soluble lipid weight basis are shown in Table IV. Significantly lower residues were found in the animals fed Aroclor 1242 vs those fed the higher chlorinated products Aroclor 1254 and Aroclor 1260. The residue levels found in the tissues of the animals fed 1, 10 and 100 ppm of Aroclor 1242 and 1 ppm Aroclor 1260 did not continuously increase, but instead began to plateau at some point after three months. Alteration of the homolog distribution of all products was also observed. The alteration, as observed in the 30 day study, was greatest for Aroclor 1242 and least for Aroclor 1254 and Aroclor 1260.

3) Three - Generation Reproduction Study in Albino Rats with: Aroclor 1242, Aroclor 1254, Aroclor 1260

Three generations of rats were fed Aroclors at exposure levels of 1, 10, and 100 ppm. The animals for succeeding generations were selected from the second litters. Second rat pups from the third litter of the first generation were retained for residue analysis. Two whole rat pups from each test group were analyzed for PCB residues. Again, as with the earlier rat studies, the alumina column clean-up procedure was sufficient. The PCB residues calculated on a wet tissue weight basis are shown ~~below~~ in table

ppm PCB Residue (Wet Weight Basis)

Exposure Level / Product	1 ppm	10 ppm	100 ppm
Aroclor 1242	0.8	4	32
" 1254	2	16	155
" 1260	1	8	104

The corresponding results calculated on a lipid weight basis are shown in table.

~~ppm PCB Residue (Lipid Weight Basis)~~

~~Exposure Level~~	1 ppm	10 ppm	~~100 ppm~~
Aroclor 1242	67	78	578
" 1254	48	170	2328
" 1260	21	213	2371

Comparison with the PCB levels found during the two-year study indicates the PCB levels in the rat pups are equivalent or slightly higher than the PCB levels in the parents. The altered homolog distributions observed in the rat pups were equivalent to those observed in the parents (two year study).

MONS 048155

b) 90 - Day Subacute Oral Toxicity of Aroclor 1016, [illegible] 1221 in Albino Rats

Exposure levels of 30, 100 & 300 ppm, in the feed were used with the rats fed Aroclor 1016 while exposure levels of 1, 10 & 100 ppm were used with the rats fed Aroclor 1221. At the end of 90 days exposure, muscle liver & fat samples were excised for analysis. With the animals fed Aroclor 1016 the abbreviated clean-up procedure, an alumina column treatment, was again sufficient. However, with the animals fed Aroclor 1221 low levels of PCB residue with a homolog distribution corresponding to that found in Aroclor 1260 were observed. At these low levels several interferences became significant and the extracts required the complete clean-up procedure before quantitation. The PCB residues found, calculated on a wet tissue weight basis are shown in Table. IV

MONS 048156

The corresponding results calculated on a hexane soluble lipid weight basis are shown in Table VI.

The PCB residues levels found in the rats fed Aroclor 1016 ~~are~~ were comparable to the PCB residue levels found in the rats fed Aroclor 1242 during the two-year study. The PCB residues levels found in the rats fed Aroclor 1221 were considerably lower than those observed during the previous rat studies. Alterations of the homolog distributions of both products were observed. The drastic alterations observed with Aroclor 1221 confirms the fact that as the degree of chlorination decreases the alteration of the homolog distribution increases.

5) Two-Year Chronic Oral Toxicity Study of: Aroclor 1242, Aroclor 1254, Aroclor 1260 in Beagle Dogs

Beagle dogs were fed the Aroclors at concentrations of 1, 10, & 100 ppm in the food for a period of two years. At the end of the two-year feeding period one-half of the dogs were sacrificed and muscle, liver and fat tissues were excised for analysis. The remaining dogs were placed on a normal diet (no test material) for a recovery period. One-half of the recovery dogs (25% total) were sacrificed for 30 days ~~on the normal diet~~ and the remainder (25% total) were sacrificed at the end of 60 days. This was the first study in which a balanced subset of samples were analyzed and a multiple regression equation was used to predict the PCB residues in the samples not analyzed. The samples from the 30 and 60 day recovery

samples were handled in this way while the complete sample set from the 24 month analysis was analyzed. Several interferences to the quantitation of the low levels of PCB residues in the dog tissues were encountered. This necessitated the use of the complete clean-up procedure, chemical treatments (saponification, sulfuric extraction) followed by an alumina column treatment, on the extracts before quantitation on the EC/GC could be carried out. The PCB residues found calculated on a wet tissue weight basis are shown in Table III. The corresponding results calculated on a hexane soluble lipid weight basis are shown in Table XIII. The PCB residues (lipid weight basis) predicted by the regression equation are shown in Table IX.

The TCB residues levels in the dogs are at least an order of magnitude less than the residues levels observed in the rats. In addition the residues levels in the animals placed on the recovery diet decreased to approximately one-half the 24 month residue level in 60 days. Alterations of the homolog distribution were observed with all of the products fed and were much more extensive than previously noted in any of the other tissue studies. The regression equation obtained indicated that, relative to the rat studies completed earlier, there was more scatter in these data. This increased variability is understandable in light of the fact that much lower residue levels were observed and that the tissue samples from the recovery sacrifices were from individual animals rather than group composite samples analyzed in the rat.

MONS 048160

c) 90-Day Subacute Oral Toxicity Study of Aroclor 1016, Aroclor 1221 in Beagle Dogs.

With the dogs fed Aroclor 1016 exposure levels of 30, 100, and 300 ppm in the feed were used, while the dogs fed Aroclor 1221 were exposed at levels of 10, 100, and 300 ppm. At the end of 90 days exposure, muscle, liver, and fat tissues were excised for analysis. As with the earlier dog study the complete clean-up procedure (chemical and alumina column treatments) was required to remove the interferences to quantitation of the PCB residues in the EC/GC. The PCB residues found calculated on a wet tissue weight basis are shown in Table X. The corresponding results calculated on a hexane soluble lipid weight basis are shown in Table XI.

Quantitation the PCB residues found in rats fed Aroclor 1016 were comparable to those found in rats fed Aroclor 1242, the corresponding PCB residues found in the dogs were comparable. The dogs fed Aroclor 1221 retained the lowest level of PCB residue encountered in any study so far. Alterations of the homolog distributions were observed with both products and these alterations were the most extensive observed to date.

1) Toxicity, Reproduction, and Residue Study of Aroclor 1242, Aroclor 1254, Aroclor 1260 in White Leghorn Chickens.

MONS 048162

Twelve week old chickens were selected grouped and fed the Aroclors at exposure levels of 1, 10, and 100 ppm in the diet. When there were sufficient eggs (~200) for residue analysis, hatch data, etc. produced by

a test group, one-half of the chickens in that group were sacrificed. Muscle, liver and fat tissues were excised and along with the corresponding eggs were retained for residue analysis. This residue sacrifice occurred somewhere between the 22 and and 26 th week on test. The remaining one half of the chickens were placed on a 30 day recovery diet. Eggs were collected each week of the recovery period and retained for residue analysis. At the end of the recovery period somewhere between the 26 th and 30th week all of the remaining chickens were sacrificed and the tissues were set aside for residue analysis. All chicks hatched were fed a normal (control ration) diet for 30 days and then sacrificed and set aside for residue analysis. The abbreviated clean-up procedure, an alternate extraction technique,

MONS 048163

were used on the estimates from this study. In this way all of the interferences to the quantitation of the PCB residues were removed. As with the two-year dog study, a balanced subset of tissue samples were selected for residue analysis. The PCB residues found in the selected samples were used to develop a regression equation for predicting the PCB residues in the tissues not analyzed. The PCB residues calculated on a wet tissue weight basis are shown in Table XII. The corresponding results calculated on a hexane soluble lipid weight basis are shown in Table XIII. The PCB residues (lipid weight basis) in the remaining tissues predicted by the regression equation are shown in Table XIV.

A significant decrease in PCB residues was observed in the muscle, fat and egg tissues from the animals fed the recovery diet. The PCB residues level

in the liver decreased only slightly. Reviolitization of the residues in the animals subjected to the highest exposure was noticeably slower. A decrease in PCB residue level was also noted in the transfers from parent to egg to chick. Alteration of the homolog distributions of all products fed in all tissues ~~was noted~~ were observed.

1) Toxicity, Reproduction and Residue Study of Aroclor 1242, Lot # AK-255 in White Leghorn Chickens

Upon the observation of toxic effects with Aroclor 1242 at the 10 and 100 ppm exposure levels, this supplementary study was initiated. The experimental design was the same as before with the exception that the chickens were exposed at the 2, 4 and 8 ppm level. A balanced subset were again chosen for analysis, and PCB residues in the tissues were determined as before. The data was

then combined with that from the 1, 10. and 100 ppm exposure levels for statistical work-up. The PCB residues calculated on a wet weight basis are shown ~~shown~~ in Table The corresponding results calculated on a hexane soluble lipid weight basis are shown in Table. The PCB residues (lipid weight basis) in the remaining tissues predicted by the regression equation are shown in Table. Conclusions drawn from this study are included in the comments on the previous study.

Acute Toxicity of Aroclor 1016, Aroclor 1242 and DDT to Bluegill and Channel Catfish During 21 Days Continuous Exposure to Chemicals in Water

MONS 048166

Ten fish were placed in vessels that were continuously being replenished with water containing a known concentration of the Aroclors. Bluegill and Channel catfish fingerlings were exposed to the Aroclors at the , 0.01, 0.02, 0.04, 0.06, 0.11, 0.18, and 0.30 ppm exposure levels for a period of 21 days. At the end of the exposure period the number of fish surviving was noted, and then the survivors were quick frozen and retained for residue analysis. Composites of the survivors, the entire fish, were subjected to the residue analysis. Once more the abbreviated clean-up procedure was sufficient to remove any interferences to the quantitation of the PCB residues. The PCB residues found calculated on a wet tissue weight basis are shown in Table . The corresponding results calculated on a hypothetical lipid weight

MONS 048167

levels are shown in Table .

The data indicate that the fish are capable of concentrating considerable quantities of the dyestuff. Concentration factors on the order of $10^6 - 10^7$ were observed. No alterations of the homolog distributions of these products were observed. This is not surprising in view of the levels found.

MONS 048168

IBT #67009 30-Day Tissue Collection Study in Albino Rats with Aroclors

ppm PCB in Rat Tissues (Wet Weight Basis)

Material	Tissue	30 Day Sacrifice				Sacrifice
		300 ppm		1000 ppm		Exposure Level
		♂	♀	♂	♀	Sex
Aroclor 1242	Muscle	5	12	17	29	
	Kidney	1	2	5	2	
	Liver	3	5	10	17	
	Fat	—	276	377	412	
Aroclor 1254	Muscle	56	36	271	167	
	Kidney	8	13	47	156	
	Liver	57	54	176	227	
	Fat	695	660	4660	3430	
Aroclor 1260	Muscle	82	136	266	555	
	Kidney	29	16	72	91	
	Liver	126	125	200	206	
	Fat	2130	2035	9190	11970	

MONS 048169

IBT #27009 30 Day Tissue Collection Study in Albino Rats with Aroclors

ppm PCB in Rat Tissues (Lipid Weight Basis)

Material	Tissue	30 Day Sacrifice				Sacrifice
		300 ppm		1000 ppm		Exposure Level
		♂	♀	♂	♀	Sex
Aroclor 1242	Muscle	37	58	736	855	
	Kidney	12	28	276	146	
	Liver	61	220	753	793	
	Fat	—	395	816	722	
Aroclor 1254	Muscle	1396	1274	7735	6202	
	Kidney	655	1895	3325	12972	
	Liver	2370	3358	5318	6678	
	Fat	1094	1289	7208	7544	
Aroclor 1260	Muscle	2470	4849	8879	24111	
	Kidney	2056	2671	5181	7579	
	Liver	3808	6226	6263	10300	
	Fat	3061	3430	13715	19088	

MONS 048170

IBT # B7298 Two-Year Chronic Oral Toxicity Study of Aroclor in Albino Rats

ppm PCB in Rat Tissues (Wet Weight Basis)

Material	Tissue	1 ppm			10 ppm			100 ppm			Exposure Level
		3 mo.	12 mo.	24 mo.	3 mo.	12 mo.	24 mo.	3 mo.	12 mo.	24 mo.	Sacrifice
Aroclor 1242	Muscle	0.7	1	1.8	1.4	6	14	5	33	73	
	Liver	0.1	0.2	0.5	0.2	0.6	1	0.9	5	5	
	Fat	6	7	6	12	30	43	60	144	220	
Aroclor 1254	Muscle	2	2	13	8	131	98	46	94	352	
	Liver	0.1	0.4	1.2	1	23	6	15	24	133	
	Fat	6	19	45	75	632	315	1208	794	1533	
Aroclor 1260	Muscle	6	8	15	8	50	116	10	419	785	
	Liver	0.2	1	08	2	3	5	18	53	107	
	Fat	28	56	50	417	224	298	482	2000	4447	

MONS 048171

IBT # B7298 Two-Year Chronic Oral Toxicity Study of Aroclor in Albino Rats

ppm PCB in Rat Tissues (Lipid Weight Basis)

Material	Tissue	1 ppm			10 ppm			100 ppm			Exposure Level
		3 mo.	12 mo	24 mo.	3 mo.	12 mo.	24 mo.	3 mo	12 mo.	24 mo.	Sacrifice
Aroclor 1242	Muscle	8	6	5	16	38	74	76	236	239	
	Liver	11	16	18	26	40	52	77	241	234	
	Fat	6	8	9	13	32	47	67	151	227	
Aroclor 1254	Muscle	10	11	38	96	721 (196)	389	756	1092	2164	
	Liver	18	24	82	115	914 (292)	307	1137 (2000)	869	1810 (4800)	
	Fat	6	19	55	76	688 (231)	348	329 (900)	860	1894	
Aroclor 1260	Muscle	16	47	44	60	259	436	146 (689)	2247	5154	
	Liver	20	50	56	102	189	442	1677	1752	6310	
	Fat	32	60	62	138	262	354	866	2143	5060	

( ) – Adjusted values from regression equation.

Regression equation – log ppm PCB residue = 3.6265 – 1.5799 (if 1242) – [illegible] (if 1254) + 0.4[illegible] (if liver) + 0.8936 (log ppm fed) + 0.0609 (time – 12)

MONS 048172

IBT # P7297 Three-Generation Reproduction Study in Albino Rats with Aroclor

ppm PCB in Rat Pups (Wet Weight Basis)

	21 Day Sacrifice			Sacrifice
Material	1 ppm	10 ppm	100 ppm	Exposue Level
Aroclor 1242	0.2	4	32	
Aroclor 1254	2	16	155	
Aroclor 1260	1	8	104	

ppm PCB in Rat Pups (Lipid Weight Basis)

	21 Day Sacrifice			Sacrifice
Material	1 ppm	10 ppm	100 ppm	Exposure Level
Aroclor 1242	67	78	578	
Aroclor 1254	48	170	2328	
Aroclor 1260	21	213	2371	

MONS 048173

IBT # 9888C
9888D

90-Day Subacute Oral Toxicity Study of Aroclor in Albino Rats

ppm PCB in Rat Tissues (Wet Weight Basis)

		90 Day Sacrifice						Sacrifice
		30 ppm		100 ppm		300 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1016	Muscle	14	4	20	15	8	5	
	Liver	5	1	10	16	4	0.5	
	Fat	24	27	138	193	6	88	

MONS 048174

		90 Day Sacrifice						Sacrifice
		1 ppm		10 ppm		100 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1221	Muscle	0.5	0.4	3	1	3	2	
	Liver	0.06	0.1	0.06	0.5	0.2	2	
	Fat	2	4	16	5	36	50	

IST # 9888 C
9888 D

90-Day Subacute Oral Toxicity Study of Aroclor in Albino Rats

ppm PCB in Rat Tissues (Lipid Weight Basis)

		90-Day Sacrifice						Sacrifice
		30 ppm		100 ppm		300 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1016	Muscle	28	40	175	16000	4501	4272	
	Liver	160	43	160	376	68	11	
	Fat	30	34	175	294	7	115	

MONS 048175

		90-Day Sacrifice						Sacrifice
		1 ppm		10 ppm		100 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1221	Muscle	5	5	29	18	64	74	
	Liver	3	7	4	22	10	65	
	Fat	3	5	19	5	42	56	

IBT #9888C
9888D

90-Day Subacute Oral Toxicity Study of Aroclor in Albino Rats

Predicted ppm PCB in Rat Tissues (Lipid Weight Basis)

		90-Day Sacrifice						Sacrifice
		30 ppm		100 ppm		300 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1016	Muscle	32	32	208	208	1128	1128	
	Liver	82	82	245	245	661	661	
	Fat	32	32	208	208	1128	1128	

		90-Day Sacrifice						Sacrifice
		1 ppm		10 ppm		100 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1221	Muscle	5	5	19	19	76	76	
	Liver	2	8	5	22	14	60	
	Fat	5	5	13	13	36	36	

1016 Regression Equation $\log \text{ppm PCB} = -0.7559 + 1.5370(\log \text{ppm fed}) + 1.3445(\text{if liver}) - 0.6365(\log \text{ppm fed if liver})$

1221 Regression Equation $\log \text{ppm PCB} = 0.6[illegible] + 0.4427(\log \text{ppm fed}) - 0.4186(\text{if liver}) - 0.[illegible](\log \text{ppm fed if [illegible]}) + 0.[illegible](\text{if [illegible]})$

MONS 048176

IBT #C7299 Two-Year Chronic Oral Toxicity Study of Aroclor in Beagle Dogs

ppm PCB in Dog Tissues (Wet Weight Basis)

Material	Tissue	1 ppm						10 ppm						100 ppm						Exposure Level
		24 mo.		30 d.		60 d.		24 mo.		30 d.		60 d.		24 mo.		30 d.		60 d.		Sacrifice
		♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1242	Muscle	0.07	0.08	0.09	0.06			0.3	0.2		0.2		0.04	0.6	0.5	0.3	0.4	0.5		
	Liver		0.08	0.3	0.04		0.04	0.2	0.1		0.1	0.05		0.6		0.4	0.3			
	Fat	2	2	1	0.5	0.5		1	1		2	1	2	4	4	9	2			
Aroclor 1254	Muscle	0.3	0.08	0.2		0.1	0.1	0.7	0.3		0.7			4	3				3	
	Liver	0.1	0.2		0.2			0.4	0.7			0.5		2	2	1				
	Fat	4	3	2			2	5	4		18			35	73				34	
[illegible]	[illegible]	0.2	0.1		1		0.2	1	0.4		6		3	26	10		34	26		
[illegible]	Liver	0.2	0.1	0.1			0.3	2	0.7	2	1	0.9	1	11	4		2	9		
	[illegible]	11	14		14		4	101	31	40	47		62	355	221		35	175		

MONS 048177

IBT #C7299 Two-Year Chronic Oral Toxicity Study of Aroclor in Beagle Dogs

ppm PCB in Dog Tissues (Lipid Weight Basis)

Material	Tissue	1 ppm						10 ppm						100 ppm						Exposure Level
		24 mo.		30 d.		60 d.		24 mo.		30 d.		60 d.		24 mo.		30 d.		60 d.		Sacrifice
		♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1242	Muscle	2	2	1	2			6	3		2		1	19	20	10	10	6		
	Liver		4	11	2		2	8	8		9	4		29		23	18			
	Fat	2	3	1	1	06		1	2		2	2	2	6	7	13	3			
Aroclor 1254	Muscle	10	4	4		2	2	18	18		9			61	95				32	
	Liver	8	6		9			23	40			43		110	130	111				
	Fat	5	3	3			2	6	10		22			128	132				42	
Aroclor 1260	Muscle	9	7		8		3	78	20		66		37	796	100		491	301		
	Liver	17	13	11			21	175	43	112	135	55	120	762	213		81	659		
	Fat	14	13		20		5	159	39	54	72		73	1261	297		439	239		

MONS 048178

IBT #C7299 Two-Year Chronic Oral Toxicity Study of Aroclor in Beagle Dogs

ppm PCB in Dog Tissues (Lipid Weight Basis)

Material	Tissue	1 ppm						10 ppm						100 ppm						Exposure Level
		24 mo.		30 d.		60 d.		24 mo.		30 d.		60 d.		24 mo.		30 d.		60 d.		Sacrifice
		♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1242	Muscle	2	2	1	2			6	3		2		1	19	20	10	10	6		
	Liver		4	11	2		2	8	8		9	4		29		23	18			
	Fat	2	3	1	1	06		1	2		2	2	2	6	7	13	3			
Aroclor 1254	Muscle	10	4	4		2	2	18	18		9			61	95				32	
	Liver	8	6		9			23	40			43		110	130	111				
	Fat	5	3	3			2	6	10		22			128	132				42	
Aroclor 1260	Muscle	9	7		8		3	78	20		66		37	796	100		491	301		
	Liver	17	13	11			21	175	43	112	135	55	120	762	219		81	659		
	Fat	14	18		20		5	159	39	54	72		78	1261	287		457	233		

MONS 048179

IBT #C7299 Two-Year Chronic Oral Toxicity Study of Aroclor in Beagle Dogs

Predicted ppm PCB in Dog Tissues (Lipid Weight Basis)

Exposure Level	1 ppm						10 ppm						100 ppm					
Sacrifice	24 mo.		30 d.		60 d.		24 mo.		30 d.		60 d.		24 mo.		30 d.		60 d.	
Sex	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
Aroclor 1242																		
Muscle	2	2	1	1	0.7	0.7	5	4	4	3	2	2	20	10	9	6	6	4
Liver	3	3	2	2	1	1	10	8	7	5	5	4	28	18	18	12	11	8
Fat	2	2	1	1	0.7	0.7	5	4	4	3	2	2	20	10	9	6	6	4
Aroclor 1254																		
Muscle	5	5	4	4	3	3	24	20	20	16	16	13	121	80	100	65	80	54
Liver	10	10	8	8	6	6	47	38	39	31	33	26	238	156	195	128	157	103
Fat	5	5	4	4	3	3	24	20	20	16	16	13	121	80	100	65	80	54
Aroclor 1260																		
Muscle	8	8	8	8	7	7	54	44	50	40	47	38	355	233	333	217	303	202
Liver	16	16	14	14	14	14	105	84	98	80	91	74	699	457	654	426	605	397
Fat	8	8	8	8	7	7	54	44	50	40	47	38	355	233	333	217	308	202

MONS 048180

IBT # 9887
9885

90-Day Subacute Oral Toxicity Study of Aroclor in Beagle Dogs

ppm PCB in Dog Tissues (Wet Weight Basis)

		90 Day Sacrifice						Sacrifice
		30 ppm		100 ppm		300 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1016	Muscle	0.3	0.06	2	0.3	7	1	
	Liver	0.1	0.1	0.4	0.1	1	0.2	
	Fat	8	1	9	3	24	4	

MONS 048181

		90 Day Sacrifice						Sacrifice
		10 ppm		100 ppm		300 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1221	Muscle	0.04	0.04	0.2	0.2	0.2	0.2	
	Liver	0.07	0.02	0.2	0.1	0.02	0.2	
	Fat	0.7	0.8	5	3	8	9	

IBT #9887
9885

90-Day Subacute Oral Toxicity Study of Aroclor in Beagle Dogs

ppm PCB in Dog Tissues (Lipid Weight Basis)

		90 Day Sacrifice						Sacrifice
		30 ppm		100 ppm		300 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1016	Muscle	8	1	30	5	69	20	
	Liver	10	6	27	10	90	18	
	Fat	11	2	13	8	36	7	

MONS 048182

		90 Day Sacrifice						Sacrifice
		10 ppm		100 ppm		300 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1221	Muscle	0.8	0.8	2	5	27	7	
	Liver	6	2	20	10	1	18	
	Fat	0.9	1	6	6	11	12	

IBT #9837
9885

90-Day Subacute Oral Toxicity Study of Aroclor in Beagle Dogs

Predicted ppm PCB in Dog Tissues (Lipid Weight Basis)

		90 Day Sacrifice						Sacrifice
		30 ppm		100 ppm		300 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1016	Muscle	8	2	20	5	48	12	
	Liver	13	4	35	9	82	22	
	Fat	8	2	20	5	48	12	

MONS 048183

		90 Day Sacrifice						Sacrifice
		10 ppm		100 ppm		300 ppm		Exposure Level
Material	Tissue	♂	♀	♂	♀	♂	♀	Sex
Aroclor 1221	Muscle	1	1	5	5	11	11	
	Liver	5	2	25	10	60	21	
	Fat	1	1	5	5	11	11	

IBT #J7300 Toxicity Reproduction and Residue Study of Aroclor in White Leghorn Chickens

ppm PCB in Chicken Tissues (Wet Weight Basis)

		Residue Sacrifice						30 Day Chick Sacrifice			1st wk	2nd wk	3rd wk	4th wk	1st wk	2nd wk	3rd wk	4th wk	1st wk	2nd wk	3rd wk	4th wk	Final Sacrifice					
		1ppm		10ppm		100ppm		1ppm	10ppm	100ppm	1ppm				10 ppm				100 ppm				1ppm		10ppm		100ppm	
		♂	♀	♂	♀	♂	♀	♂ & ♀	♂ & ♀	♂ & ♀	30 Day Recovery Period												♂	♀	♂	♀	♂	♀
Aroclor 1242	Muscle		0.06				2	0.07	0.05															0.05		0.1		5
	Liver				2			0.4	0.2															0.7		2		45
	Fat	26	17			146c	1231																	4				8
	Eggs				5		38								3	0.6	0.5		26	30	19	24						
Aroclor 1254	Muscle			0.9	0.7			0.02																		0.1		
	Liver		0.8				50	0.09																0.9				27
	Fat			561	189																					73		
	Eggs	0.7					132					2	0.5	0.4						68	75	36						
Aroclor 1260	Muscle		0.2				11	0.06	0.8															0.09				2
	Liver				6			0.09	0.2																	13		
	Fat	153	15			625	1159																	10				1012
	Eggs	1		13							1	0.7			13	8												

MONS 048184

IBT #J7300 Toxicity, Reproduction and Residue Study of Aroclor in White Leghorn Chickens

ppm PCB in Chicken Tissues (Lipid Weight Basis)

		Residue Sacrifice						30 Day Chick Sacrifice			1st wk	2nd wk	3rd wk	4th½ wk	1st wk	2nd wk	3rd wk	4th½ wk	1st wk	2nd wk	3rd wk	4th½ wk	Final Sacrifice					
		1 ppm		10 ppm		100 ppm		1 ppm	10 ppm	100 ppm	1 ppm				10 ppm				100 ppm				1 ppm		10 ppm		100 ppm	
		♂	♀	♂	♀	♂	♀	♂♀♀	♂♀♀	♂♀♀	30 Day Recovery Period												♂	♀	♂	♀	♂	♀
Aroclor 1242	Muscle		13				901	9	12															8		30		639
	Liver				52			14	12															10		28		1580
	Fat	30	22			2462	1310																	4				9
	Eggs			37		472									33	5	5		383	341	249	368						
Aroclor 1254	Muscle			517	240			2																		61		
	Liver		18				1475	4																7				1529
	Fat			892	193																					78		
	Eggs	10				1410						14	6	5						1324	626	632						
Aroclor 1260	Muscle		40				6000	5	125															13				887
	Liver				65			6	6																	56		
	Fat	123	19			2280	1306																	11				1057
	Eggs	12		146							13	7			135	71												

MONS 040185

IBT #J7200 Toxicity, Reproduction and Residue Study of Aroclor in White Leghorn Chickens

Predicted ppm PCB in Chicken Tissues (Lipid Weight Basis)

		Residue Sacrifice						30 Day Chick Sacrifice			1st wk	2nd wk	3rd wk	4th wk	1st wk	2nd wk	3rd wk	4th wk	1st wk	2nd wk	3rd wk	4th wk	Final Sacrifice					
		1 ppm		10 ppm		100 ppm		1 ppm	10 ppm	100 ppm	1 ppm				10 ppm				100 ppm				1 ppm		10 ppm		100 ppm	
		♂	♀	♂	♀	♂	♀	♂ & ♀	♂ & ♀	♂ & ♀	30 Day Recovery Period												♂	♀	♂	♀	♂	♀
Aroclor 1242	Muscle	20	12	196	119	1897	1152																10	6	92	56	893	541
	Liver	12	7	114	69	1107	669																12	7	104	63	1013	614
	Fat	20	12	196	119	1897	1152																10	6	92	56	893	541
	Eggs	3		40		498					2	0.9	0.6	0.4	25	16	10	7	424	362	308	263						
Aroclor 1254	Muscle	68	22	657	213	6355	2061																26	8	249	81	2407	782
	Liver	34	11	326	106	3163	1027																25	8	243	79	2336	759
	Fat	68	22	657	213	6355	2061																26	8	249	81	2409	782
	Eggs	7		92		1141					6	5	4	3	80	66	54	44	1007	881	775	681						
Aroclor 1260	Muscle	124	29	1193	284	11463	2762																42	10	377	90	3624	958
	Liver	57	24	552	131	5306	1275																42	10	326	87	3135	836
	Fat	124	29	1193	284	11463	2762																42	10	377	90	3624	958
	Eggs	11		140		1728					12	13	14	15	137	135	133	131	1543	1372	1231	1099						

Chicken Regression Equation $\log$ ppm PCB = $-0.5311 + 0.9858 (\log_{10}$ ppm fed) $+ 0.7341$ (if female) $+ 0.0438$ (% Cl_2) $+ 0.2908$ (if rec. liver) $- 0.0056$ (% Cl_2) if liver $- 0.0075$ (% Cl_2) if rec. $- 0.0226$ (% Cl_2) if female

Egg Regression Equation $\log$ ppm PCB = $-0.7478 - 1.1994 (\text{rec. time}) + 1.0920 (\log_{10}$ ppm fed) $+ 0.0300$ (% Cl_2) $+ 0.5314$ (rec. time $\times \log_{10}$ ppm fed) $+ 0.0202$ (rec. time $\times$ % Cl_2) $- 0.0075$ (rec. time $\times \frac{1}{2}$ ppm fed $\times$ % Cl_2)

Chick Regression Equation – insufficient data

MONS 048186

IBT #6746 Toxicity, Reproduction and Residue Study of Aroclor in White Leghorn Chickens

ppm PCB in Chicken Tissues (Wet Weight Basis)

		Residue Sacrifice			30 Day Chick Sacrifice			1st wk	2nd wk	3rd wk	4th wk	1st wk	2nd wk	3rd wk	4th wk	1st wk	2nd wk	3rd wk	4th wk	Final Sacrifice		
		2 ppm	4 ppm	8 ppm	2 ppm	4 ppm	8 ppm	2 ppm				4 ppm				8 ppm				2 ppm	4 ppm	8 ppm
		♂♀	♂♀	♂♀	♂♀	♂♀	♂♀	30 Day Recovery Period												♂♀	♂♀	♂♀
fed 1242	Muscle			1	0.02	0.04	0.03													0.5		1
	Liver		4		0.3	0.2	0.2														2	
	Fat			56	2	3	5													11		43
	Eggs	1							1		1	2		1			4					

MONS 048187

IBT #8746 Toxicity, Reproduction and Residue Study of Aroclor in White Leghorn Chickens

ppm PCB in Chicken Tissues (Lipid Weight Basis)

		Residue Sacrifice			30 Day Chick Sacrifice			1st wk	2nd wk	3rd wk	4th wk	1st wk	2nd wk	3rd wk	4th wk	1st wk	2nd wk	3rd wk	4th wk	Final Sacrifice		
		2 ppm	4 ppm	8 ppm	2 ppm	4 ppm	8 ppm	2 ppm				4 ppm				8 ppm				2 ppm	4 ppm	8 ppm
		♂♀♀	♂♀♀	♂♀♀	♂♀♀	♂♀♀	♂♀♀													♂♀♀	♂♀♀	♂♀♀
Aroclor 1242	Muscle			84	5	8	13													19		71
	Liver		30		15	19	17														17	
	Fat			73	3	5	9													14		56
	Eggs	14							14		15	22		25			42		28			

MONS 048188

IBT #2746 Toxicity, Reproduction and Residue Study of Aroclor in White Leghorn Chickens

Predicted ppm PCB in Chicken Tissues (Lipid Weight Basis)

		Residue Sacrifice			30 Day Chick Sacrifice			1st wk	2nd wk	3rd wk	4th wk	1st wk	2nd wk	3rd wk	4th wk	1st wk	2nd wk	3rd wk	4th wk	Final Sacrifice		
		2 ppm	4 ppm	8 ppm	2 ppm	4 ppm	8 ppm	2 ppm				4 ppm				8 ppm				2 ppm	4 ppm	8 ppm
		♂♀	♂♀	♂♀	♂♀	♂♀	♂♀													♂♀	♂♀	♂♀
Aroclor 1242	Muscle	31	62	123																15	29	58
	Liver	18	36	71																17	33	66
	Fat	31	62	123																15	29	58
	Eggs	7	15	32				4	2	1	0.5	8	5	3	1	19	12	7	4			

Biosonics Inc. Acute Toxicity of Aroclor to Bluegill and Channel Catfish

MONS 048190

% PCB in Fish Tissues (Wet Weight Basis)

		21 Day Sacrifice							Sacrifice
Material	Species		0.02 ppm	0.04 ppm	0.06 ppm	0.11 ppm	0.18 ppm	0.30 ppm	Exposure Level
Aroclor 1016	Bluegill		0.01	0.005	0.007	0.04	0.04		
	Channel Catfish		0.01	0.01	0.05	0.06	0.1	0.2	

		21 Day Sacrifice							Sacrifice
Material	Species	0.014 ppm	0.023 ppm	0.038 ppm	0.064 ppm	0.108 ppm	0.180 ppm	0.300 ppm	Exposure Level
Aroclor 1221	Bluegill	0.004	0.01	0.03	0.02	0.07			
	Channel Catfish	0.009	0.02	0.03	0.09	0.2	0.3	0.3	

Bionomics Inc. Acute Toxicity of Aroclor to Bluegill and Channel Catfish

MONS 048191

% PCB in Fish Tissues (Lipid Weight Basis)

		21 Day Sacrifice							Sacrifice
Material	Species		0.02 ppm	0.04 ppm	0.06 ppm	0.11 ppm	0.18 ppm	0.30 ppm	Exposure Level
Aroclor 1016	Bluegill		0.8	0.5	0.7	3.8	3.2		
	Channel Catfish		0.8	0.3	3.8	3.3	5.3	7.5	

		21 Day Sacrifice							Sacrifice
Material	Species	0.014 ppm	0.023 ppm	0.038 ppm	0.064 ppm	0.108 ppm	0.180 ppm	0.300 ppm	Exposure Level
Aroclor 1242	Bluegill	0.5	0.8	1.6	1.6	5.6			
	Channel Catfish	0.2	0.5	1.0	2.0	4.2	5.6	6.6	

MONS 048192

Bionomics Inc. Acute Toxicity of Aroclor to Bluegill and Channel Catfish

Predicted % PCB in Fish Tissues (Lipid Weight Basis)

		21 Day Sacrifice							Sacrifice
Material	Species		0.02 ppm	0.04 ppm	0.06 ppm	0.11 ppm	0.18 ppm	0.30 ppm	Exposure Level
Aroclor 1016	Bluegill		0.5	0.9	1.6	3.0	5.6		
	Channel Catfish		0.3	0.6	1.2	2.4	4.6	9.0	

		21 Day Sacrifice							Sacrifice
Material	Species	0.014 ppm	0.023 ppm	0.038 ppm	0.064 ppm	0.108 ppm	0.180 ppm	0.300 ppm	Exposure Level
Aroclor 1221	Bluegill	0.5	0.8	1.3	2.3	4.0			
	Channel Catfish	0.3	0.5	0.9	1.7	3.2	5.8	10.6	

Regression Equation: $\log$ % PCB = 1.6353 + 1.0635 ($\log$ ppm PCB in H_2O) + 0.1063 ($\log$ ppm PCB in H_2O if channel catfish) + 0.1332 ($\log$ ppm PCB in H_2O if 1016)

Table I	30 day	42, 54, 60	Wet
II	"	"	Lyid
III	Two Year	42, 54, 60	Wet
IV			Lyid
V	90 Day	16, 21	Wet
VI			Lyid
VII	2 year Dogs		Wed
VIII	"		Lyid
IX	"		Pred Lyid
X	90 Day Dogs		Wet
XI			Lyid
XII	Chickens		Wet
XIII	"		Lyid
IXV	"		Predicted

$\frac{18}{12}$

MONS 048193

90 day dogs

1016

log ppm PCB = -0.2769 + 0.7885 (log feed) + 0.2382 (if liver) - 0.5815 (if female)

Error 0.1803

1221

= - 0.7730 + 0.7299 (log feed) + 0.7178 (if liver) - 0.4252 (liver if female)

Error 0.1750

95% limits

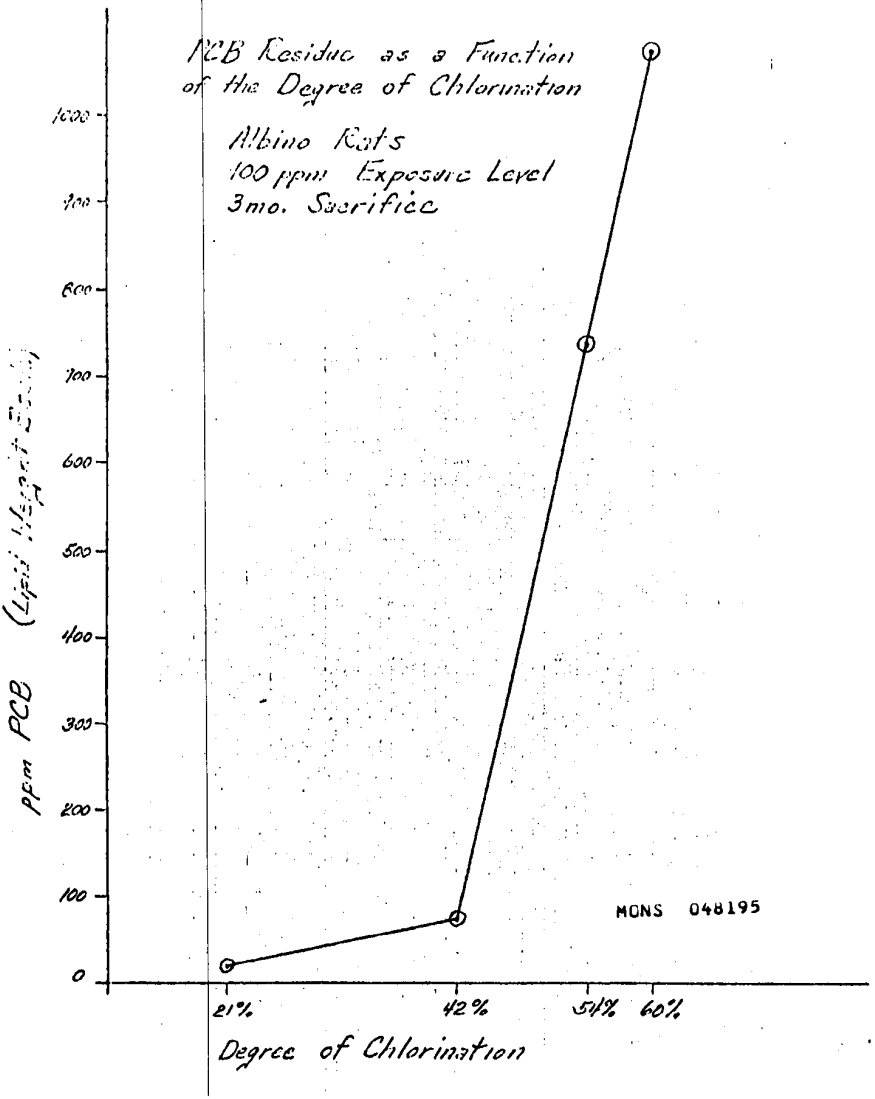
± 0.3500

0.1750

10

.3500 -10

MONS 048194


PCB Residue as a Function of the Degree of Chlorination
Albino Rats
100 ppm Exposure Level
3mo. Sacrifice
ppm PCB (Lipid Weight Basis)
1000
900
800
700
600
500
400
300
200
100
0
21%
42%
54%
60%
Degree of Chlorination
MONS 048195

PCB Residue as a Function of the Degree of Chlorination

Beagle Dogs
100 ppm Exposure Level

