

TABLE I

PRIMARY AND ULTIMATE BIODEGRADABILITY OF DIELECTRIC FLUIDS AND COMPONENTS

Chemical	Structure/ Constitution	Ultimate Biodegradability (% of Theoretical CO ₂ evolved)		Primary biodegradability					
		Theoretical CO ₂ evolved	Ultimate CO ₂ evolved	CO ₂ evolved after 30 days	CO ₂ evolved after 90 days	CO ₂ evolved after 180 days	Initial concentration	CO ₂ evolved after 30 days	CO ₂ evolved after 90 days
352 1,2-dichlorodiphenyl- ethane 7538		86 (35-Day)		3	> 97				32.3 ± 0.9 AC-72-M-3
353 1,2-dichlorodiphenyl- ethane 7538		90 (35-Day)		3	> 97				83.1 ± 5.4 AC-72-M-3
354 1,2-dichlorodiphenyl- methane 77473				3	> 99				91.6 ± 3.7 AC-72-M-3
355 1,2-dichlorodiphenyl- methane 377473		83 (35-Day)		3	> 97				76.2 ± 5.5 AC-72-M-3

PLAINTIFF'S
EXHIBIT

682-A

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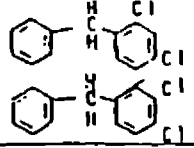
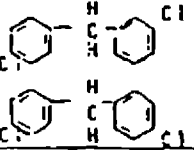
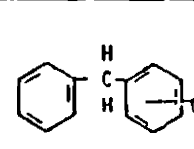
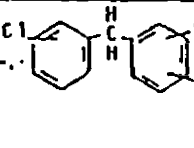
Test Material	Structure/ Composition	Ultimate Biodegradability (% of Theoretical CO ₂ Production)		Primary Biodegradability						
		Inorganic -Double -Sulfur -Chlorine	Inorganic -Double -Sulfur -Chlorine	Semi-Continuous Potability		Sludge (SCAS)	River Bio-Assay (BDA)		Soil Bio-Assay (SBA)	
				Cultivation Rate (% reduction per cycle)	Primary Biodegradation Loss Rate (% of CO ₂)		Initial Conc (ppm)	Days Required for 50% Primary Bio- gradation	2-Week Primary (% reduction biomass)	4-Week Primary (% reduction biomass)
						Low, and +/- moderate volatiles, strong, and vari- ous inhibition of sludge growth rate and activity.				
0-77-552 CS 1560 mixture of 2,4- and 3,4-dichloro- diphenyl methane) CP 77473				3 13	> 97 > 99	Volatility loss < 1% ++ For more detail see AC-73-55-18.			79.6 ± 1.6	AC-72-11
0-77-557 CS 1559 mixture of 2,4- and 3,4-dichloro- diphenyl methane) EC 77473				3	3 ± 6	Volatility loss < 1% ++ For more detail see AC-73-55-18.			89.7 ± 2.3	AC-72-11
0-77-558 CS 1553 Trichlorodiphenyl methane) P 76793			26 (35-Day)	3 13	> 99 63 ± 10 27 ± 12	No detectable vola- tility loss (<0.1%) ++ (13th-23rd week) (24th-31st week) Slowly degrading trichlorophenyl- acetic acid meta- bolite formed.			71.3 ± 6.7	AC-75-11
0-77-569 CS 1614 mixture of 2,3,4- 3,3',4', and 4,3',4'-tri- chlorodiphenyl methane) P 76773				3	10 ± 10	Volatility loss < 1% ++ For more detail see AC-73-55-18.			84.2 ± 5.1	AC-72-11

TABLE 1

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Serial	Structural/Composition	Ultimate Biodegradability (% of Theoretical CO ₂ Evolution)		Primary Biodegradability						
		Thompson-Duttie Procedure	Modified Static Flask procedure	Activated Sludge (SCS)			Biotest Dia-A by (SCS)		SCS and HPL Analytical methods	
				Acclimation Rate (ppm added per cycle)	Primary Biodegradation Rate (%/C.D.)	Conc'd.	Initial (Conform)	Days Required for 50% Primary Degradation	% Recovery (in duplicate Experiments)	Notes
				24-hour Cycle						
- 560 - 6793 Bis(diphenyl ether)				3	6 ± 11	Volatility loss < 1%, + For more detail see AC-73-SS-18.			77.5 ± 2.2	AC-72-H-3
- 561 - 73 Bis(chloromethane)				3	1 ± 10	Volatility loss < 1%, + For more detail see AC-73-SS-18.			94.1 ± 4.8	AC-72-H-3
- 562 - 73 Bis(chlorobenzene)				3	7 ± 10	Volatility loss < 1%, + For more detail see AC-73-SS-18.			74.4 ± 4.5	AC-75-H-13
- 563 - 11612 - 7-564 Bis(ether)				3	10 ± 4	+			87.3 ± 4.2	AC-71-H-17
- 564 - 11612 - 7-564 Bis(diphenyl ether)				40-Hour Cycle		Volatility loss ~7%, + For more detail see AC-72-SS-13.			95.1 ± 6.3	AC-72-H-24

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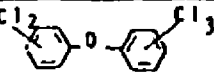
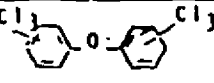
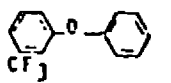
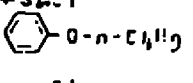
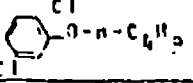
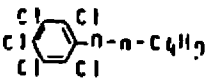
Test Material	Structure/ Composition	Ultimate Biodegradability (% of Theoretical CO ₂ Evolution)		Primary Biodegradability						
		Thomas -Duhr -Sturm procedure	Toronto Shore Flask procedure	Schramm and Associates Studio (SCAS)			River Directory (R.D.)		ASTM D-1551 Analytical Methods	
				Reduction Rate (ppm added per cycle)	Primary Degradation Rate (% in 24 h)	Comments	Initial Conc (ppm)	Req'd for 50% Primary De- gradation (days)	% Recovery (mixed liquor extraction)	Notes
						+, ++, and +/- indicate moderate, strong, and vari- able inhibition of biodegradation rate respectively.				
				24-Hour Cycle						
0-77-565 m-chlorodiphenyl ether mixture FB 94453	 47.4% Chlorine			1	1 ± 12	Volatility loss not significant.			72.8 ± 2.6	AC-74-11-1
0-77-566 m-chlorodiphenyl ether mixture FB 94453	 55% Chlorine			1	-4 ± 15	Volatility loss not significant.			73.9 ± 5.3	AC-74-11-1
0-77-567 1,3-bis(1,1,1-trifluoromethyl)- phenyl ether CP 94455				3 13	60 ± 15 35 ± 12	Volatility loss 10-10% ++ ++ For more detail see AC-72-55-13.			83.9 ± 3.7	AC-72-11-1
0-77-568 FA 94456 1,3-bis(2-chlorophenyl)- propyl ether and 1,3-bis(2-chlorophenyl)- butyl ether	 			3	45 ± 6	Volatility loss 1-3% ++ For more detail see AC-72-55-13.			103.4 ± 11.2	AC-72-11-1
0-77-569 1,3-bis(2,4-dichlorophenyl) ether FB 94456				1	-1 ± 17	Volatility loss ≤ 1% +			70.2 ± 2.8	AC-74-11-5

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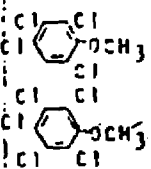
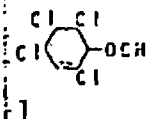
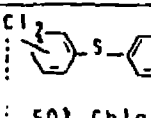
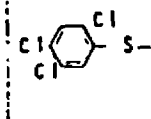
Test Material	Structure/ Composition	Ultimate Biodegradability (% of T. carbonates) C ₁₀ Reduction		Primary Biodegradability						
		Toxicity -Dose -Route -Procedure	Toxicity -Dose -Route -Procedure	24-Hour Cycle		Comments	Sludge (24-Hr)		Sludge (24-Hr)	Sludge (24-Hr)
				Retention Rate (% of T. carbonates) (% of T. carbonates)	Retention Rate (% of T. carbonates) (% of T. carbonates)		Initial Conc (mg/L)	Final Conc (mg/L)		
						0, 4, and 4% indicate volatile, sludge, and water- soluble inhibition of sludge growth rate respectively.				
10-77-570 NCS 1646 Mixture of 2,3,4,6-Tetra- chloroanisole and penta- chloroanisole) FB99459	 87% 13%	52 (28-Day)		1 3 13	> 95 > 99 > 99				78.5 ± 3.2	AC-74-1
10-77-571 NCS 1647 [2,3,4,5-Tetra- chlorophenyl-1- thio-2- propenyl] ether				1	9 ± 5	Volatility loss ≤ 1%.			69.4 ± 3.7	AC-74-1
10-77-572 NCS 1548 Pentachloro- phenyl sul- fide mixture FB99459	 50% Chlorine			1	5 ± 11	Volatility loss ≤ 1%.			100.0 ± 13.1	AC-74-1
10-77-573 NCS 1649 (2,4,5-Tri- chlorodiphenyl sulfide) FB99459				1	4 ± 6	Volatility loss ≤ 1%.			83.2 ± 1.3	AC-74-1

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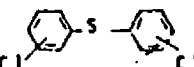
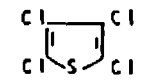
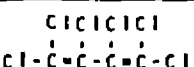
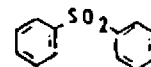
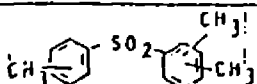
Chemical	Structure/ Composition	Ultimate Biodegradability (% of Theoretical CO ₂ Evolved)		Primary Biodegradability				
		Thiobacillus -Oxidans -Oxidans -Oxidans	Aerobic -Oxidation -Oxidation -Oxidation	Sedimentation/Sludge (SCPS)			River BI - Marine	
				Ammonia -Oxidation (% of Theoretical CO ₂ Evolved)	Primary Biodegradability (% of Theoretical CO ₂ Evolved)	Comments	Initial Concentration	Final Concentration
				24-hour	Cycle	1, 4, and 7- indicate inhibition, secondary, and tertiary inhibition of sludge growth rate is not active.		
77-574 S 1650 Dichlorodi- phenyl sulfide FA99459				1	19 ± 5	Volatility loss ≤ 12. ±		101.6 ± 2.2 AC-74-N-10
77-575 S 1653 Tetrachloro butadiene 33481				1 3	Not detectable	Very high volatility losses.		71.6 ± 7.7
77-576 S 1654 Tetrachloro butadiene 57-2				1 3	Not detectable	Very high volatility losses.		66.8 ± 3.6 AC-74-N-10
77-577 S 1655 Diphenyl sulfone FA99460				3	1 ± 6	Volatility loss ≤ 10. For more detail see AC-72-SS-16		94.0 ± 3.4 AC-72-N-6
77-578 S 1302 Polyalkyl siloxane 116677				3 48-hour	23 ± 10 Cycle 42 ± 12	Volatility loss ≤ 1%. For more detail see AC-72-SS-16		99.0 ± 6.5 AC-71-N-23 AC-72-N-6

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Material	Structure/ Composition	Ultimate Biodegradability (% of Theoretical) Gas Evolution		Primary Biodegradability					
		Thompson -Bottle -Stump procedure	Modified Stump Flow procedure	N. and S. Bioscience Laboratory (BSLS)			Filter of -100 (BSL)		Recovery of Total Biodegradable Substances
				Added Rate (mg. per 100 ml. per cycle)	Primary & Secondary Rate (mg. per 100 ml. per cycle)	Conc. loss	Initial Conc. (mg/ml)	Days Required for 50% Primary Bio- degradation	
				26-hour cycle		+, ++, and +/— Indicate moderate, strong, and vari- able inhibition of sludge growth rate respectively.			
77-579 313 diethyl diphenyl sulfone) E 99460	<chem>CC1=CC=C(C=C1)S(=O)(=O)C2=CC=CC=C2</chem>			3	36 ± 6	Volatility loss $\leq 1\%$ For more detail see AC-72-55-16			105.6 ± 14.3 AC-72-M-6
77-580 312 diethyl diphenyl sulfone) E 99460	<chem>CC1=CC=C(C=C1)S(=O)(=O)C2=CC=CC=C2</chem>			3	13 ± 4	Volatility loss $\leq 1\%$ For more detail see AC-72-55-16			97.6 ± 3.5 AC-72-M-6
77-581 314 diisopro- phenyl diphenyl sulfone) E 99460	<chem>CC(C)C1=CC=C(C=C1)S(=O)(=O)C2=CC=CC=C2</chem>			3	27 ± 8	Volatility loss $\leq 1\%$ For more detail see AC-72-55-16			111.2 ± 10.0 AC-72-M-6
77-582 332 diisopro- phenyl diphenyl sulfone) E 99460	<chem>CC(C)C1=CC=C(C=C1)S(=O)(=O)C2=CC=CC=C2</chem>			3	17 ± 6	Volatility loss $\leq 1\%$			96.3 ± 1.6 AC-75-M-14

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Material	Structure/ Composition	Ultimate Biodegradability (% of Theoretical CO ₂ Evolution)		Primary Biodegradability							
		Thompson -Bottle -Stump procedure	Ponders -Bottle -Flask procedure	Semi-Continuous Activated Sludge (SCAS)			Silver Bio-Assay (BSA)		AMS and MS Analytical Points		
				Addition Rate (gms added per vol-l)	Primary % Degradation (from data at 85°C.L.)	Comments	Initial Conc.(mg/l)	Days Req'd for 50% Primary De- gradation	% Recovery (Mixed Liquor Extraction)	Notes	
				24-Hour Cycle			+, +, and +/- indicate moderate, strong, and vari- able inhibition of sludge growth rate respectively.				
AC-71-M-15 Polymer 711 polyethyl malate) (62-140)		86 (27-Day)		3	52 ± 10 48 ± 3 54 ± 7	For more detail see AC-73-SS-29 and AC-75-SS-R.		15	100.7 ± 3.3	AC-71-M-15 AC-72-M-4	
77-583 polyethoxy alates (DOP) (62-140)		86 (27-Day)		3	79 ± 11 79 ± 3	For more detail see AC-73-SS-29 and AC-75-SS-R.	1	30	74.1 ± 5.0	AC-72-M-2	
77-584 sol 100 and only diethyl - one (urea) (62-140)				8	61 ± 8	Volatility loss ~5%. Diethyl benzyl ether degraded much more rapidly than polybenzyl components.			36.9 ± 2.4	AC-71-M-29 AC-72-M-2 AC-72-M-21	
77-585 urea of S-711 and MCS 1302)				3	38 ± 7	Volatility loss ~12%. For more detail see AC-73-SS-16.			92.8 ± 5.1	AC-73-M-11	
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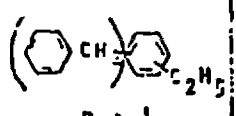
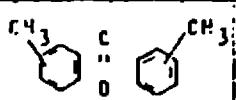
Material	Structure/ Composition	Ultimate Biodegradability % of theoretical CO ₂ Evolution		Primary Biodegradability						
		Thompson -Cuthrie -Sturm procedure	200 ml Shake -Folk procedure	Semi-continuous Activated Sludge (SCS)			Shake Flask (SF)		New York Analytical Lab	
				Adaptation Time (open added and cycle)	Primary % Biodegrada- tion Rate (% CO ₂ Evol.)	Comments	Initial Conc (ppm)	Day Period for 50% Primary Bio- degradation	% Recovery Final BOD Equivalent	Notes
				24-Hour Cycle		1, 2, and 3% indicate moderate, strong, and variable inhibition of sludge growth rate respectively.				
77-586 1475 Structure of Santocyl 25% ACS and 25% H ₂ O	50% Santocyl 100 25% H ₂ O (Complex alkyl- benzene mixture)			3	21 ± 12	Volatility loss ≤ 1%.			81.0 ± 4.1	AC-73-M-11
77-587 1342 methyl couphenone)				3 13	85 ± 9 93 ± 6 52 ± 21	Volatility loss ≤ 1%. For more detail see AC-73-SF-16			89.0 ± 4.6	AC-73-M-25
77-588 1221 trichloro- diphenyl)	 21% Cl 11% Biphenyl 51% Monochloro- 32% Dichloro- 3% Trichloro- 2% Tetrachloro-	45 (28-Day)		24-Hour Cycle		Volatility loss ≤ 6%.			95.8 ± 1.4	AC-71-K-17
				1	73 ± 21					
				3	82 ± 17	Lot AK-2				
				48-Hour Cycle		For more detail see AC-71-SF-6 and AC-72-SF-17				
				1	91 ± 6					
				8	87 ± 5					

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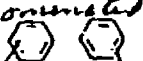
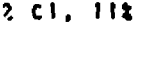
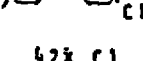
Material	Structure/Composition	Biological Activity (100% Mortality)		Biological Activity (50% Mortality)		Biological Activity (25% Mortality)		Biological Activity (10% Mortality)	
		Preparation - Batch/Source	Exposure - Route/Duration	Application - Dose/Conc.	Activity - % Mortality	Application - Dose/Conc.	Activity - % Mortality	Application - Dose/Conc.	Activity - % Mortality
-77-587	 104% 1,1'-dichloro-2,2'-biphenyl	43 (35-Day)	Lot QA47	1	74 ± 7	+ Lot QA47			94.7 ± 1.0 AC-71-H-17
-77-590	 104% 1,1'-dichloro-2,2'-biphenyl	43 (35-Day)	Lot QA47	1	74 ± 7	+ Lot QA47			94.7 ± 1.0 AC-71-H-17
-77-591	 104% 1,1'-dichloro-2,2'-biphenyl	43 (35-Day)	Lot QA47	1	74 ± 7	+ Lot QA47			94.7 ± 1.0 AC-71-H-17
-77-592	 104% 1,1'-dichloro-2,2'-biphenyl	43 (35-Day)	Lot QA47	1	74 ± 7	+ Lot QA47			94.7 ± 1.0 AC-71-H-17
-77-593	 104% 1,1'-dichloro-2,2'-biphenyl	43 (35-Day)	Lot QA47	1	74 ± 7	+ Lot QA47			94.7 ± 1.0 AC-71-H-17
-77-594	 104% 1,1'-dichloro-2,2'-biphenyl	43 (35-Day)	Lot QA47	1	74 ± 7	+ Lot QA47			94.7 ± 1.0 AC-71-H-17

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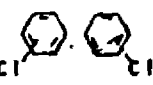
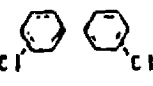
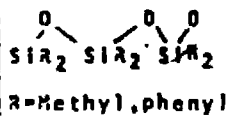
Test Material	Structure/ Composition	Ultimate Biodegradability (% of Theoretical CO ₂ Evolution)		Primary Biodegradability					
		Fraction -Biotic -Stress procedures	Fraction -Biotic -Stress procedures	Solid-Contaminant Test (SCAT)			Sliver Blank Test (SBL)		
				Adhesion Rate (ppm added per cycle)	Primary Biomass Loss Rate (% D.L.)	Comments	Initial Concentration	Final Concentration Primary Bio- production	Final Concentration Secondary Bio- production
						+, +, and +/- indicate moderate, strong, and vari- able inhibition of sludge growth rate respectively.			
-77-592 Factor 1242 Polychlori- ated Biphenyl)	 428 Cl	11 (35-Day)		48-Hour Cycle 1		Volatility loss ~4%. Lot AK-255 For more detail see AC-71-55-6 and AC-72-55-19.			83.8 ± 1.3 AC-71-N-
CP48367	1% Monochloro- 16% Dichloro- 49% Trichloro- 25% Tetrachloro- 8% Pentachloro- 1% Hexachloro-								
-77-593 Factor 1254 Polychlori- ated Biphenyl)	 548 Cl			48-Hour Cycle 1		Volatility loss, ≤ 1%. Lot AK-38 For more detail see AC-71-55-6.			75.5 ± 2.4 AC-71-N-
CP75365	1% Trichloro- 21% Tetrachloro- 40% Pentachloro- 23% Hexachloro- 6% Heptachloro-								

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Test Material	Structure/ Description	Ultimate Biodegradability (% of Theoretical CO ₂ Evolution)		Primary Biodegradability						
		Thompson -Duchie -Sturm procedure	No. Tests Smoke Flash procedure	Semi-Continuous Activated Sludge (SCAS)			River Bio-Assay (RBA)		Soxhlet and Soxhlet Extraction	
				Addition Rate (ppm added per cycle)	Primary Biodegra- tion Rate (% CO ₂ Evol.)	Comments	Initial Conc'n	Days Req'd for 50% Primary Bio- oxidation	% Recovery (Mixed Liquid Extraction)	Method No.
				24-Hour Cycle		+ , ++, and +/- indicate moderate, strong, and vari- able inhibition of sludge growth rate respectively.				
5-77-594 -Corning dimethylphenyl disiloxane) 594461				3	16 ± 13	No detectable volatility loss. For more detail see AC-73-SS-23.			79.6 ± 8.2	AC-73-H-31
5-77-595 1238 -m-dichloro benzene)				1	14 ± 8	Volatility loss ~9% +/- For more detail see AC-72-SS-15.			77.3 ± 2.4	AC-72-H-19