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AUTHORS: B. Mason Hughes

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ABSTRACT: Samples from the Delaware River Plant were analyzed for specified organic compounds. The results of these analyses are shown in this report.

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MONS 022591

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ANALYSIS OF DELAWARE RIVER WATER SAMPLES

AUTHORS: B. Mason Hughes
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INTRODUCTION

Twelve samples and four duplicate samples were received from the Delaware River Plant for analysis of benzyl compounds and Aroclor 1248. The samples were filtered and the solid residue and filtrate analyzed using methods previously described.(1)

RESULTS

Samples, duplicates, method blanks and standards were analyzed. Tables 1 - 4 show the results of the residue analysis; Tables 5 - 8 show the results of the filtrate analysis. No benzal chloride, with a level of detection of 1.0 ug/mL, was detected in any of the samples.

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(1) Monsanto ESC Report No. MDA-359, Job No. 483.4060, April 15, 1983.

TABLE 1. RESULTS OF CAPILLARY GC/MS ANALYSES OF SEDIMENT FROM DELAWARE RIVER PLANT WATER SAMPLES

483.41118

April 7, 1983

Analyte	Analysis Method	L.O.D. ^a	Sample Identification					
			1-23D	1-27D	1-39D	1-43-1	1-43-2	1-48-1
			Concentration (µg/L)					
Benzaldehyde	GC/MS	1.0	ND ^b	ND	ND	ND	ND	ND
Benzyl chloride	GC/MS	1.0	ND	ND	ND	ND	ND	ND
Benzyl alcohol	GC/MS	1.0	ND	ND	ND	ND	ND	2.9
Aroclor 1248	GC/MS	0.5	NA ^c	NA	NA	NA	NA	0.24
Aroclor 1248	GC/EC	0.5	ND	ND	ND	ND	ND	0.24
Surrogate Spiking Compound	Analysis Method	Amount added (µg/L)	Recovery (%)					
Phenol-d ₅	GC/MS	41	120	70	67	97	68	70
2-Cl-phenol-d ₄	GC/MS	43	160	84	69	110	44	77
1,2-Cl ₂ -benzene-d ₄	GC/MS	42	93	58	49	56	26	32
Pyrene-d ₁₀	GC/MS	40	140	130	120	96	38	56
Chrysene-d ₁₂	GC/MS	40	110	110	110	95	66	73
MS Extraction Number	-		2169-S	2170-S	2171-S	2172-S	2174-S	2175-S
Sample Vol. Extracted (L)	-		1	1	1	1	1	1

^aL.O.D. = limit of detection in µg/L.

^bND = none detected with a detection limit given by the L.O.D. value for each compound.

^cNA = not analyzed.

TABLE 2. RESULTS OF CAPILLARY GC/MS ANALYSES OF SEDIMENT FROM DELAWARE RIVER PLANT WATER SAMPLES

483.41118

April 7, 1983

Analyte	Analysis Method	L.O.D. ^a	Sample Identification					
			1-48-2	1-48-3	1-Blank-48-3	1-53-1	1-53-2	1-54-2
			Concentration (µg/L)					
Benzaldehyde	GC/MS	1.0	ND ^b	ND	ND	5.4	ND	ND
Benzyl chloride	GC/MS	1.0	ND	ND	ND	ND	ND	ND
Benzyl alcohol	GC/MS	1.0	ND	1.5	1.1	4.1 ± 10 ³	0.04	ND
Aroclor 1248	GC/MS	0.5	NA ^c	0.46	NA	0.17	0.14	1.1
Aroclor 1248	GC/EC	0.5	ND	0.76	ND	0.38	0.52	1.5
Surrogate Spiking Compound	Analysis Method	Amount added (µg/L)	Recovery (%)					
Phenol-d ₅	GC/MS	41	100	70	64	79	110	73
2-Cl-phenol-d ₄	GC/MS	43	120	80	63	110	120	91
1,2-Cl ₂ -benzene-d ₄	GC/MS	42	47	38	18	67	82	50
Pyrene-d ₁₀	GC/MS	40	41	39	90	87	63	47
Chrysene-d ₁₂	GC/MS	40	58	47	100	86	72	54
SEC Extraction Number	-		2176-S	2177-S	2178-S	2179-S	2180-S	2181-S
Sample Vol. Extracted (L)	-		1	1	1	1	1	1

^aL.O.D. = limit of detection in µg/L.^bND = none detected with a detection limit given by the L.O.D. value for each compound.^cNA = not analyzed.

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TABLE 3. RESULTS OF CAPILLARY GC/MS ANALYSES OF SEDIMENT FROM DELAWARE RIVER PLANT WATER SAMPLES

483.41118

April 7, 1983

Analyte	Analysis Method	L.O.D. ^a	Sample Identification					
			1-23-D-duplicate	1-43-2-duplicate	1-48-2-duplicate	1-48-3-duplicate		
			Concentration (µg/L)					
Benzaldehyde	GC/MS	1.0	ND ^b	ND	ND	ND		
Benzyl chloride	GC/MS	1.0	ND	ND	ND	ND		
Benzyl alcohol	GC/MS	1.0	1.2	0.85	0.49	0.66		
Aroclor 1248	GC/MS	0.5	NA ^c	NA	NA	0.72		
Aroclor 1248	GC/EC	0.5	ND	ND	ND	1.2		
Surrogate Spiking Compound	Analysis Method	Amount added (µg/L)	Recovery (%)					
Phenol-d ₆	GC/MS	41	90	89	94	72		
2-Cl-phenol-d ₄	GC/MS	43	110	100	100	79		
1,3-Cl ₂ -benzene-d ₄	GC/MS	42	62	75	74	43		
Pyrene-d ₁₀	GC/MS	40	85	46	50	34		
Chrysene-d ₁₂	GC/MS	40	84	42	48	54		
SEC Extraction Number	-		2181-S	2182-S	2183-S	2184-S		
Sample Vol. Extracted (L)	-		1	1	1	1		

^a L.O.D. = limit of detection in µg/L.

^b ND = none detected with a detection limit given by the L.O.D. value for each compound.

^c NA = not analysed.

MONS-5/D-3

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Analyte	Analysis Method	L.O.D. ^a	Sample Identification					
			Method Blank	Method Blank	Method Blank			
			Concentration (µg/L)					
Benzaldehyde	GC/MS	1.0	ND ^b	ND	ND			
Benzyl chloride	GC/MS	1.0	ND	ND	ND			
Benzyl alcohol	GC/MS	1.0	ND	ND	ND			
Aroclor 1240	GC/MS	0.5	NA ^c	NA	NA			
Aroclor 1240	GC/EC	0.5	ND	ND	ND			
Surrogate Spiking Compound	Analysis Method	Amount added (µg/L)	Recovery (%)					
Phenol-d ₆	GC/MS	41	97	91	89			
2-Cl-phenol-d ₆	GC/MS	43	120	110	100			
1,2-Cl ₂ -benzene-d ₆	GC/MS	42	60	69	62			
Pyrene-d ₁₀	GC/MS	40	74	68	34			
Chrysene-d ₁₂	GC/MS	40	73	73	41			
NBC Extraction Number	-		2173-S	2185-S	2187-S			
Sample Vol. Extracted (L)	-		1	1	1			

^aL.O.D. = limit of detection in µg/L.

^bND = none detected with a detection limit given by the L.O.D. value for each compound.

^cNA = not analyzed.

TABLE 5. RESULTS OF CAPILLARY GC/MS ANALYSES OF FILTERED FROM DELAWARE RIVER PLANT WATER SAMPLES

483.41118

April 7, 1983

Analyte	Analysis Method	L.O.D. ^a	Sample Identification					
			1-23D	1-27D	1-39D	1-43-1	1-43-2	1-48-1
			Concentration (µg/L)					
Benzaldehyde	GC/MS	1.0	ND ^b	ND	ND	ND	ND	ND
Benzyl chloride	GC/MS	1.0	ND	ND	ND	ND	ND	1.1
Benzyl alcohol	GC/MS	1.0	ND	ND	ND	ND	ND	2.1
Aroclor 1248	GC/MS	0.5	NA ^c	NA	NA	NA	NA	0.39
Aroclor 1248	GC/EC	0.5	ND	ND	ND	ND	ND	0.37
Fortranite Spiking Compound	Analysis Method	Amount added (µg/L)	Recovery (%)					
Phenol-d ₆	GC/MS	41	7.9	42	57	40	27	12
2-Cl-phenol-d ₆	GC/MS	43	32	110	150	120	70	89
1,2-Cl ₂ -benzene-d ₆	GC/MS	42	10	86	120	82	47	72
Pyrene-d ₁₀	GC/MS	40	20	120	110	94	80	85
Chrysene-d ₁₂	GC/MS	40	18	65	96	84	85	38
MSC Extraction Number	-		2169-B/M	2170-B/M	2171-B/M	2172-B/M	2174-B/M	2175-B/M
Sample Vol. Extracted (L)	-		1	1	1	1	1	1

^aL.O.D. = limit of detection in µg/L.^bND = none detected with a detection limit given by the L.O.D. value for each compound.^cNA = not analyzed.

TABLE 6. RESULTS OF CAPILLARY GC/MS ANALYSES OF FILTERED FROM DELAWARE RIVER PLANT WATER SAMPLES

483.41118

April 7, 1983

Analyte	Analysis Method	L.O.D. ^a	Sample Identification					
			1-48-2	1-48-3	1-Blank-48-3	1-53-1	1-53-2	1-54-2
			Concentration (µg/L)					
Benzaldehyde	GC/MS	1.0	ND ^b	ND	ND	260	ND	ND
Benzyl chloride	GC/MS	1.0	ND	ND	ND	<100	ND	ND
Benzyl alcohol	GC/MS	1.0	ND	ND	ND	1.2 x 10 ⁴	14	ND
Aroclor 1248	GC/MS	0.5	NA ^c	0.06	NA	<0.5	NA	0.50
Aroclor 1248	GC/EC	0.5	ND	0.36	ND	<50	ND	0.50
Surrogate Spiking Compound	Analysis Method	Amount added (µg/L)	Recovery (%)					
Phenol-d ₅	GC/MS	41	19	20	26	- ^d	26	36
2-Cl-phenol-d ₄	GC/MS	43	64	73	69	-	65	7
1,2-Cl ₂ -benzene-d ₄	GC/MS	42	43	44	47	-	56	31
Pyrene-d ₁₀	GC/MS	40	77	76	65	-	87	20
Chrysene-d ₁₂	GC/MS	40	72	79	28	-	7	15
HBC Extraction Number	-		2176-B/H	2177-B/H	2178-B/H	2179-B/H	2180-B/H	2181-B/H
Sample Vol. Extracted (L)	-		1	1	1	1	1	1

^a L.O.D. = limit of detection in µg/L.

^b ND = none detected with a detection limit given by the L.O.D. value for each compound.

^c NA = not analyzed.

^d - = high levels present, sample had to be diluted.

TABLE 7. RESULTS OF CAPILLARY GC/MS ANALYSES OF FILTERED FLOW DELAWARE RIVER PLANT WATER SAMPLES

483.41118

April 7, 1983

Analyte	Analysis Method	L.O.D. ^a	Sample Identification					
			1-23-D-duplicate	1-43-2-duplicate	1-48-2-duplicate	1-48-3-duplicate		
			Concentration (µg/L)					
Benzaldehyde	GC/MS	1.0	ND ^b	ND	ND	ND		
Benzyl chloride	GC/MS	1.0	ND	ND	ND	ND		
Benzyl alcohol	GC/MS	1.0	46	2.3	2.0	1.4		
Aroclor 1248	GC/MS	0.5	NA ^c	NA	NA	0.41		
Aroclor 1248	GC/EC	0.5	ND	ND	ND	0.31		
Surrogate Spiking Compound	Analysis Method	Amount added (µg/L)	Recovery (%)					
Phenol-d ₆	GC/MS	41	27	30	20	24		
2-Cl-phenol-d ₄	GC/MS	43	65	64	46	59		
1,2-Cl ₂ -benzene-d ₄	GC/MS	42	51	44	30	37		
Pyrene-d ₁₀	GC/MS	40	54	63	33	42		
Chrysene-d ₁₂	GC/MS	40	41	71	14	42		
HBC Extraction Number	-		2181-B/W	2182-B/W	2183-B/W	2184-B/W		
Sample Vol. Extracted (L)	-		1	1	1	1		

^aL.O.D. = limit of detection in µg/L.

^bND = none detected with a detection limit given by the L.O.D. value for each compound.

^cNA = not analyzed.

MONS-5/79-3

TABLE 8. RESULTS OF CAPILLARY GC/MS ANALYSES OF FILTERED FROM DELAWARE RIVER PLANT WATER SAMPLES

483.41118

April 7, 1983

Analyte	Analysis Method	L.O.D. ^a	Sample Identification					
			Method Blank	Method Blank	Method Blank			
			Concentration (µg/L)					
Benzaldehyde	GC/MS	1.0	ND ^b	ND	ND			
Benzyl chloride	GC/MS	1.0	ND	ND	ND			
Benzyl alcohol	GC/MS	1.0	ND	0.96	ND			
Aroclor 1248	GC/MS	0.5	NA ^c	NA	NA			
Aroclor 1248	GC/EC	0.5	ND	ND	ND			
SURFACTANT Spiking Compound			Recovery (%)					
Phenol-d ₆	GC/MS	41	13	33	21			
2-Cl-phenol-d ₄	GC/MS	43	33	82	43			
1,2-Cl ₂ -benzene-d ₄	GC/MS	42	26	52	30			
Pyrene-d ₁₀	GC/MS	40	21	92	31			
Chrysene-d ₁₂	GC/MS	40	17	32	5.0			
NBC Extraction Number	-		2173-B/W	2185-B/W	2187-B/W			
Sample Vol. Extracted (L)	-		1	1	1			

^a L.O.D. = limit of detection in µg/L.^b ND = none detected with a detection limit given by the L.O.D. value for each compound.^c NA = not analyzed.