Monsanto

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SUBJECT WATER SOLUBILITY

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REFERENCES

TO L. R. Stark
General Offices

An analytical procedure for extracting, concentrating, and measuring Aroclor at the sub ppm level in water has been developed and verified with Aroclor "spiked" tap water samples (Table I).

This procedure was employed to determine the tap water solubility of Aroclor 1242, 1248 and 1254 (Table II).

The Aroclor saturated tap water samples used in this study were prepared in the following manner: two 60-70 g. portions of each Aroclor fluid were placed in 32oz. narrow neck screw top glass bottles and 500 ml. of tap water (South Second Street) added to each. The bottles were then placed on a roller mill, rolled for 24 hours and allowed to stand undisturbed at room temperature (25°C) until analyzed. The period of time between preparation and analysis was approximately 4-5 months.

Inspection of EC/GC traces and the data in Table II indicates that the solubility of Aroclor is a function of both the amount of chlorination and the position. This anticipated behavior makes absolute quantification difficult since a standard with the same isomer distribution of the water solubilized material is impossible to prepare. Therefore, the "Aroclor found" was calculated in this manner: the original Aroclor in question was used as a standard and a calibration curve prepared by plotting the peak height of the major isomers versus µg Aroclor. The peak height response of the samples were then totaled, corrected for a tap water blank response and the amount of "Aroclor found" determined from the calibration curve. A rough idea of the error inherent in this procedure can be obtained by using 1242 as a standard for 1248, etc. A deviation on the order of ±10% was experienced.

The data in Table II also seems to indicate that a stable Aroclor-water emulsion is formed at approximately twice their solubility levels.

The Pydraul fluids being multi-component systems are a completely different story and as such will require much more effort. At this point, I think we should probably clarify what information is actually desired and if the need for this information can be justified in terms of the effort necessary to obtain it.

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Attachments - 2

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TABLE I

RECOVERY OF AROCLOR FROM SPIKED TAP WATER SAMPLES**

USING EC/CC

Sample Number	ppb Aroclor Added	Sample Volume (ml)	ppb Aroclor Found	Per Cent Recovery	Comments
OR 88932 #1	1980	250	1960	99.0	Aroclor 1242. Samples concentrated with vac. rot. evap. Results obtained 9-6-68.
OR 88932 #2	1980	250	-----*	----	
OR 88945 #1	270	225	266	98.5	Aroclor 1254. Samples concentrated w Kundera-Danish evaporative concentrators. Results obtained 12-13-68
OR 88945 #2	270	225	266	98.5	
OR 88945 #3	540	225	577	107.0	
OR 88945 #4	540	225	577	107.0	

The sample preparation and work up outlined for water samples was employed. The results were quantified by preparing a calibration curve using a hexane solution of the Aroclor 1242 and 1254 used to spike the water samples. The major isomer peak area was used to construct the curve. The water samples were spiked by injecting µl amounts of a concentrated acetone***-Aroclor solution.

* Sample contaminated - results discarded.

** Data used to confirm proposed water sample work up procedure and concentration techniques.

*** Spiked water samples contained 40-60 ppm Acetone.

TABLE II

SOLUBILITY OF AROCLOR IN TAP WATER

Sample Ident. Number	Grams Aroclor Equilibrated	Sample Vol. (ml)	ppb Aroclor Found	Average
1242				
OR 88936-1+	67.5	225	193	
-2+	67.5	225	213	203 ± 10
-1*	55.1	250	372	
-2*	55.1	250	378	375 ± 3
1248				
OR 88936-1+	70.5	250	92	
-2+	70.5	250	120	106 ± 14
-1*	70.6	224	196	
-2*	70.6	225	222	209 ± 13
1254				
OR 88936-1+	73.2	250	51	
-2+	73.2	250	48	50 ± 2
-1*	69.7	224	134	
-2*	69.7	225	143	139 ± 5

+ Aqueous sample filtered through pre-wetted Whatman #2 filter paper.

* Aqueous sample carefully siphoned from bottle.