March 4, 1969

Mr. Leon A. Woods
Department of Fish and Game
Pesticides Investigations
807 Jedsmith Drive
Sacramento, California 95819

Dear Mr. Woods:

In reply to your letter of February 27, I have enclosed a table showing the general physical properties of our Aroclors. At the bottom of this table I have added the results determined in oral toxicity studies with rats and the minimum lethal dose of the Aroclors when applied to the shaved skin of rabbits. You will notice that there is a difference in the manner in which the sample is administered due to the physical form of the sample, its viscosity, solubility, etc.

We believe that these data show that the Aroclors are not seriously toxic from the standpoint of acute single exposures.

A second enclosure is a reprint describing the results of chronic inhalation experiments on two of the Aroclors. This work has led to the establishment of a threshold limit value of 1.0 milligram per cubic meter for Aroclor 1242 and 0.5 milligram per cubic meter for Aroclor 1254.

Perhaps I should point out that our designation of the Aroclors by numbers indicates the parent material and the degree of chlorine. For example the 1200 series are biphenyls chlorinated to various percentages. Thus, Aroclor 1242 is biphenyl chlorinated to the extent of 42%; Aroclor 1254 is biphenyl chlorinated to 54%. The series beginning with the numerals 24 and 44 are

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blends of chlorinsted biphenyls and chlorinated triphenyls. The 54 series are chlorinated triphenyls.

All of the Aroclors are practically insoluble in water. For example Aroclor 1242 is soluble in water at 25°C only to the extent of 203 plus or minus 10 parts per billion; Aroclor 1243 106 plus or minus 14 ppb and Aroclor 1254 50 plus or minus 2 ppb. Obviously increasing the chlorine content decreases the solubility of the material.

If I can be of any further assistance, please let me know.

Sincerely,

Elmer P. Wheeler
Manager, Environmental Health

EPW:ejs

Enclosures

bcc: W. R. Richard
P. C. Burgen
S. Tucker
J. E. Springgate
L. H. Payton

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	Aroclor 1260 Light yellow soft sticky resin	Aroclor 1262 Light yellow sticky clear resin	Aroclor 1268 White to off-white powder	Aroclor 4465 Light-yellow, clear, brittle resin	Aroclor 5442 Yellow transparent sticky resin	Aroclor 5460 Clear, yellow-to-amber, brittle resin	Aroclor 2565 Black, opaque, brittle resin
	50 max. (APHA)	50 Max. (APHA)	1.5 Max. NPA (molten)	2 Max. NPA (molten)	2 Max. NPA (molten)	2 Max. NPA (molten)	–
	0.014	0.014	0.05	0.05	0.05	0.05	1.4
	0.00067 (20°-100°C)	0.00064 (25°-65°C)	0.00067 (20°-100°C)	0.00061 (25°-65°C)	0.00123 (25°-99°C)	0.00179 (25°-124°C)	0.00066 (25°-65°C)
	1.555-1.566 (90°/15.5°C) 13.50	1.572-1.583 (90°/15.5°C) 13.72	1.804-1.811 (25°/25°C) 15.09	1.670 (25°/25°C) 13.91	1.470 (25°/25°C) 12.24	1.670 (25°/25°C) 13.91	1.734 (25°/25°C) 14.44
	385°-420°	395°-425°	435°-450°	230°-320° at 4 mm. Hg.	215°-300° at 4 mm. Hg.	280°-335° at 5 mm. Hg.	–
	0.5 to 0.8 0.0 to 0.1	0.5 to 0.6 0.0 to 0.1	0.1 to 0.2 0.0 to 0.06	0.2 to 0.3 0.0 to 0.02	0.2 0.01	0.03 1.5 to 1.7 (at 260°—5 hrs.)	0.2 to 0.3 —
	None	None	None	None	247° 477°	None	None
	None	None	None	None	>350° >662°	None	None
	31°	35°-38°	—	—	46°	—	—
	88°	99°	—	—	115°	—	—
	—	—	150° to 170° (hold pt.)	60° to 66°	46° to 52°	98° to 105.5°	66° to 72°
	—	—	302° to 338° (hold pt.)	140° to 151°	115° to 126°	208° to 222°	149° to 162°
	1.647-1.649	1.6501-1.6517	—	1.664-1.667	—	1.660-1.665	—
	72-78	86-100	—	90-150 (266°F or 130°C)	300-400	—	—
	3200-4500	600-850 (160°F or 71°C)	—	—	—	—	—
	—	—	—	—	—	—	—
	10,000** >1260** 2000**	11,300** >1260** <3160**	10,900** >2510###	16,000** >2000** <3160**	10,600** >1260** <2000**	19,200# >7940#	6,310## >2000## <3160

20% soln. in corn oil ### 10% soln. in corn oil

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General Physical Properties of the Aroclor® Chlorinated Compounds

	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254
Form	Colorless mobile oil	Practically colorless mobile oil	Practically colorless mobile oil	Colorless to light yellow-green, clear, mobile oil	Light yellow viscous oil
Color	50 Max. (APHA)	50 Max. (APHA)	50 Max. (APHA)	50 Max. (APHA)	50 Max. (APHA)
Acidity — Maximum (Mgm. KOH per Gm.)	0.014	0.014	0.010	0.010	0.010
Average Coefficient of Expansion....cc/cc/°C	0.00071 (15°-40°C)	0.00073 (25°-100°C)	0.00068 (25°-65°C)	0.00070 (25°-65°C)	0.00066 (25°-65°C)
Typical Density					
Specific Gravity	1.182-1.192 (25°/15.5°C)	1.270-1.280 (25°/15.5°C)	1.381-1.392 (25°/15.5°C)	1.405-1.415 (65°/15.5°C)	1.495-1.505 (65°/15.5°C)
Pounds per gallon — 25°C(77°F)	9.85	10.55	11.50	12.04	12.82
Distillation Range — ASTM D-20 (Mod.) Corr. °C	275°-320°	290°-325°	325°-366°	340°-375°	365°-390°
Evaporation Loss — % — ASTM D-6 Mod.					
163°C.....5 hrs.	—	—	3.0 to 3.6	3.0 to 4.0	1.1 to 1.3
100°C.....6 hrs.	1.0 to 1.5	1.0 to 1.5	0.0 to 0.4	0.0 to 0.3	0.0 to 0.2
Flash Point — Cleveland Open Cup.....°C	141°-150°	152°-154°	176°-180°	193°-196°	None
°F	286°-302°	305°-310°	348°-356°	379°-384°	
Fire Point — Cleveland Open Cup.....°C	176°	238°	None*	None	None
°F	349°	460°			
Pour Point — ASTM D-97.....°C	Crystals at 1°C	−35.5°	−19°	−7°	10°
°F	Crystals at 34°F	−32°	2°	19.4°	50°
Softening Point — ASTM E-28.....°C	—	—	—	—	—
°F	—	—	—	—	—
Refractive Index — D-line — 20°C	1.617-1.618	1.620-1.622	1.627-1.629	1.630-1.631	1.639-1.641
Viscosity — Saybolt Universal Sec. (ASTM — D-88) 210°F (98.9°C)	30-31	31-32	34-35	36-37	44-48
130°F (54.4°C)	35-37	39-41	49-56	73-80	260-340
100°F (37.8°C)	38-41	44-51	82-92	185-240	1800-2500

*None indicates "No fire point up to boiling temperature"

DSW 018342

mg/kg

Oral LD_{50}-rats (approx.) 3980* 4470* 8650* 11,000* 11,900

Skin MLD-rabbits-mg/kg >2000* >1260* >794* >794* >1260

~~administered~~ <3160* <2000* <1260* <1260* <2000*

*undiluted ** administered as 50% soln. in corn oil # 33⅓% in corn oil

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