UNCLASSIFIED

FROM (NAME & LOCATION) R. H. Munch - Technology Department - South Second Street

DATE : June 1, 1971

SUBJECT : AROCLOR 1016 SPECIFICATIONS

REFERENCE

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It has been suggested that specifications be set for Aroclor 1016 to be produced by Monsanto as a replacement for Aroclor 1242.

The guiding principles to be used in setting the specifications for Aroclor 1016 are as follows: The electrical specifications, specifications for appearance, color, acidity, water content, inorganic chlorides, sulfates, and stability will be the same as those for Aroclor 1242. Specifications for properties such as pour point, viscosity, specific gravity, refractive index, distillation range and fixed chlorine content will be changed to compensate for the higher homologs removed.

One new specification must be added. That is penta and hexachlorobiphenyl content. This is essential because our reason for producing Aroclor 1016 is to produce a product with a minimum content of higher homologs which are more persistent in the environment.

The ratio of penta and hexa content in Aroclor 1242 to that of Aroclor 1016 is our one readily quantifiable measure of the improvement achieved by going to Aroclor 1016. The penta and hexa content of Aroclor 1242 ranges from 6 to 7.2%. That for Aroclor 1016 produced so far has been less than 0.3%. On this basis, Aroclor 1016 can be said to be about 20 times better than Aroclor 1242.

The suggested specification for penta and hexa homologs is 0.4% max. to have some margin for analytical error and less efficient operation in the plant than in the pilot plant.

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One other change is suggested. Current specifications call for a dielectric constant of 4.7 to 4.9 measured at 1000 Hz and 100°C and power factor of 5.0% measured at 60 Hz and 100°C. It is suggested that the dielectric constant be determined at 60 Hz and 100°C so that measurements will not have to be made at two frequencies. The dielectric constant does not change with frequency in this range so the specification range will not change. The 1000 Hz power factor is often too low to measure accurately and should therefore be omitted as a specification.

The attached table compares the proposed specifications for Aroclor 1016 with the current specifications for Aroclor 1242. These specifications for Aroclor 1016 are proposed to serve as a starting point for development of final specifications acceptable to all interested groups in Monsanto and to our customers. Your comments are invited.

R. H. Munch

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A COMPARISON OF PROPOSED SPECIFICATIONS FOR AROCLOR 1016 WITH CURRENT SPECIFICATIONS FOR AROCLOR 1242

Unrestricted Information	Aroclor 1242	Aroclor 1016
(R) Color (APHA)	40, max.	40, max.
(R) Condition	Clear	Clear
(R) Sp. Gr. @ 25/15.5°C	1.381-1.392	1.362-1.372
(R) Acidity (mg. KOH/g.)	0.010 max.	0.010 max.
(R) Moisture	35 ppm, max.	35 ppm, max.
(R) Refractive Index @ 25°C	1.6240-1.6260	1.6215-1.6235
(R) Inorganic (Free) Chlorides	0.05 ppm, max.	0.05 ppm, max.
(R) Pour Point	-14°C or lower	-14°C or lower
(R) Dielectric Constant (1000 Hz @ 100°C)	4.70-4.90	4.70-4.90 60 hz @ 100°C
(R) Resistivity (500 VDC @ 100°C. 0.1" Gap.)	500, min.	500, min.
(R) Hydrolosis Stability Test (As Chlorides)	0.5 ppm, max.	0.5 ppm, max.
(R) Monsanto Stability Test (As Chlorides)	0.4 ppm, max.	0.4 ppm, max.
(R) Distillation Range (ASTM D-20 corrected)		
10% Distilled by Wt.	325°C min.	323°C min.
90% Distilled by Wt.	360°C max.	356°C max.
(R) Penta and Hexachloro Biphenyls*	6-7%**	0.4% max.
Sulfates	None	None
Dielectric Strength @ 25°C KV	35 min.	35 min.
Flash Point °F	338-392	338 min.
Fire Point	None to B.P.	None to B.P.
Corrosion Test (6 hrs @ 210°C with bright Al foil)		
Change in wt. of Al %	0.0	0.0
A.C. Color (APHA)	60, max.	60, max.
A.C. Condition	Clear	Clear
A.C. Acidity (mg. KOH/G)	0.010, max.	0.010, max.
A.C. Inorganic (Free) Chlorides	0.05 ppm, max.	0.05 ppm, max.
Visc. @ 100°F (SUS)	82-92	71-81

* By Physical Chemistry Method 71-11, Job No. 1348522. Disc integrator is standard. Electronic integrators may be used after proper standardization against a disc integrator.

** Range of typical values, not a specification for Aroclor 1242.

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General Information	Aroclor 1242	Aroclor 1016
Specific Heat @ 25°C	0.30	0.30
Coefficient of Expansion (25-65°C) CC/CC°C	0.00068	0.00068.
Fixed Chlorine	43 ± .5%	41.3 ± .5%
Power Factor @ 100°C		
Typical Values 60 Hz	5	5
1000 hz	0.30	-

Special Customer Requirements

General Electric		
Thermal Chemical Chlorides	0.65 ppm, max	0.65 ppm, max.
Westinghouse		
Hydrolizable Chlorine (Westinghouse Stability Test)	1.0 ppm, max.	1.0 ppm, max.

(R) Routine Analysis; all others by request only.

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