Shaughnessy No.: 081901

Date Out of EAB: MAY 15 1987

To: Lois Rossi
Product Manager 21
Registration Division (TS-767)

From: Akiva Abramovitch, Chief (Acting)
Environmental Fate Review Section #1
Exposure Assessment Branch
Hazard Evaluation Division (TS-769C)

Attached, please find the EAB review of...

Reg./File # : 50534-188, -157, -8

Chemical Name: Chlorothalonil

Type Product : Fungicide

Product Name : BRAVO

Company Name : FERMENTA

Purpose : New Use on Pecans.

Date Received: 10/28/86

Date Completed: _____

Monitoring study requested: _____

Monitoring study voluntarily: _____

Action Code: 330

EAB #(s) : 70141-3

Total Reviewing Time: 2.00 day

Deferrals to:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1/14

1.a CHEMICAL: Chlorothalonil

1.b Physical Properties: Not included in this submission.

2. TEST MATERIAL: N/A.

3. STUDY/ACTION TYPE: Application for a new use on Pecans.

4. STUDY IDENTIFICATION: N/A

5. REVIEWED BY:

Akiva D. Abramovitch, Ph.D.
Chemist
Environmental Chemistry Review Section 1/EAB/HED/OPP

Akiva Abramovitch
Date: MAY 15 1987

6. APPROVED BY:

Akiva D. Abramovitch, Ph.D.
Acting Chief
Environmental Chemistry Review Section 1/EAB/HED/OPP

Akiva Abramovitch
Date: MAY 15 1987

7. CONCLUSIONS:

This submission does not contain any environmental fate data. In reviewing the data in EAB files, the photodegradation in water and on soil and the field dissipation data requirements remain unsatisfied. EAB is concerned with potential leaching of chlorothalonil and its degradates. The degradates of chlorothalonil have been shown to have significant mobility in most agricultural soils and are more likely to enter groundwater than the parent chlorothalonil which is only very mobile in sandy soils. Chlorothalonil have been shown to be reasonably stable in water but to undergo degradation under aerobic and anaerobic conditions with a half lives of less than one month in several soils.

8. RECOMMENDATIONS:

EAB recommends that registration for a new use on pecans be deffered until all the required data is available to assess the potential risks associated with potential groundwater contamination.

9. BACKGROUND:

A. Introduction: See the Aug. 1, 1986 addendum to the Registration Standard and earlier reviews.

B. Directions for Use: See the attached label for the proposed use on Pecans. See the EAB Science Chapter for the Registration Standard on Chlorothalonil.

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES: N/A

11. COMPLETION OF ONE LINER: Not completed.

12. CBI APPENDIX: None.

CASE GS0097 CHLOROTHALONIL STUDY 12 PM 400 08/03/82

CHEM 081901 Chlorothalonil

BRANCH EFB DISC 30 TOPIC 050520

FORMULATION 00 - ACTIVE INGREDIENT

FICHE/MASTER ID 00087351 CONTENT CAT 01

Szalkowski, M.B. 1976. Effect of microorganisms upon the soil metabolism of Daconil and 4-hydroxy-2,5,6-trichloroisophthalonitrile. Unpublished study received Feb. 25, 1976 under 6F1749; submitted by Diamond Shamrock Agricultural Chemicals, Cleveland, OH; CDL:097394-I.

SUBST. CLASS = S. OTHER SUBJECT DESCRIPTORS SEC: EFB -30-05052005 EFB -30-05052010

DIRECT RVW TIME = 13 (MH) START-DATE END DATE

REVIEWED BY: G. Bartels and L. Lewis
TITLE: Staff Scientists
ORG: Dynamac Corp., Enviro Control Division, Rockville, MD
TEL: 468-2500

SIGNATURE: G. Bartels L. Lewis DATE: July 25, 1983

APPROVED BY:
TITLE:
ORG:
TEL:

SIGNATURE: DATE:

CONCLUSIONS:

Metabolism - Aerobic Soil

1. This study is scientifically valid.

2. [^{14}C]Chlorothalonil is degraded with half-lives of 22-31, 7-16, 7-16, and 0-7 days in nonsterile silt loam, peat loam, Texas sandy loam, and Ohio sandy loam soils, respectively. The rate of chlorothalonil degradation was slower in sterile soils, with half-lives of 60-90, 22-31, 7-16, and 16-22 days in the respective soils. [^{14}C]Chlorothalonil is degraded to 4-hydroxy-2,5,6-trichloroisophthalonitrile (up to 32% of the applied radioactivity at 60 days posttreatment) and 3-cyano-2,4,5,6-tetrachlorobenzamide (up to 7.4% of the applied radioactivity at 7 and 16 days posttreatment). Unextractable residues increased in both sterile and nonsterile soils over the study period, accounting for 40-42, 52-62, 63-75, and 56-63% of the applied radioactivity by day 90 in the silt loam, peat loam, Texas sandy loam, and Ohio sandy loam soils, respectively. The soils were incubated at 25 C and 80% of field capacity in the dark.

3. This study fulfills EPA Data Requirements for Registering Pesticides (1983) by providing information on the degradation of chlorothalonil and on the formation and decline of two chlorothalonil degradates in silt loam, peat loam, and two sandy loam soils for 90 days.

CASE GS0097 CHLOROTHALONIL STUDY 1 PM 400 08/03/82

CHEM 081901 Chlorothalonil

BRANCH EAB DISC -- EAB Aug. 1, 1986

FORMULATION 00 - ACTIVE INGREDIENT

FICHE/MASTER ID No MRID CONTENT CAT 01
Nelsen, T.R. 1985. An aged soil leaching study with ^{14}C-chlorothalonil (2,4,5,6-tetrachloroisophthalonitrile). Document No. 720-3EF-85-0001-001 SDS Biotech Corporation, Painesville, OH. Acc. No. 259753.

SUBST. CLASS = S.

DIRECT RVW TIME = 10 (MH) START-DATE END DATE

REVIEWED BY: K. Patten
TITLE: Staff Scientist
ORG: Dynamac Corp., Rockville, MD
TEL: 468-2500

APPROVED BY: H. Boyd
TITLE: Chemist
ORG: EAB/HED/OPP
TEL: 557-7463

SIGNATURE: DATE:

CONCLUSIONS:

Mobility - Leaching and Adsorption/Desorption

1. This study is scientifically valid.

2. Aged [^{14}C]Chlorothalonil (radiochemical purity 98.1%) was slightly mobile in sandy loam, silt loam, and clay loam soils, and mobile in sand soil based on soil column studies. The [^{14}C]chlorothalonil degradates (7-14 day aging), 3-carboxy-2,5,6-trichlorobenzamide (SDS-46851), 2-hydroxy-5-cyano-3,4,6-trichlorobenzamide (SDS-47525), and 4-hydroxy-2,5,6-trichloroisophthalonitrile (SDS-3701), were mobile in all four soils; 3-cyano-2,5,6- plus 3-cyano-2,4,5-trichlorobenzamide (SDS-47524/3) were mobile in the sandy loam, silt loam, and sand soils.

3. This study partially fulfills EPA Data Requirements for Registering Pesticides by providing information on the mobility of aged chlorothalonil in soil.

CASE GS0097 CHLOROTHALONIL STUDY 3 PM 400 08/03/82

CHEM 081901 Chlorothalonil

BRANCH EAB DISC --

FORMULATION 00 - ACTIVE INGREDIENT

FICHE/MASTER ID No MRID CONTENT CAT 01
Capps, T.M. 1982. Adsorption and desorption of chlorothalonil to soils. Document No. 555-4EF-81-0216-001. Diamond Shamrock Corporation, Painesville, OH. Acc. No. 259753.

SUBST. CLASS = S.

DIRECT RVW TIME = (MH) START-DATE END DATE

REVIEWED BY: K. Patten
TITLE: Staff Scientist
ORG: Dynamac Corp., Rockville, MD
TEL: 468-2500

APPROVED BY: H. Boyd
TITLE: Chemist
ORG: EAB/HED/OPP
TEL: 557-7463

SIGNATURE: DATE:

CONCLUSIONS:

Mobility - Leaching and Adsorption/Desorption

1. This study is scientifically valid.

2. [^{14}C]Chlorothalonil (radiochemical purity >97%) was mobile in silty clay loam, silt loam, and sandy loam soils, and very mobile in sand soil. Freundlich K_{ads} values were 26 for a silty clay loam soil, 29 for a silt soil, 20 for a sandy loam soil, and 3 for a sand soil equilibrated with 0.1-0.5 ppm of [^{14}C]chlorothalonil (radiochemical purity >97%) in a 1:4 soil: 0.03 N calcium sulfate slurry. The soils had been sieved through 250 µ (silty clay loam and silt soils) and 590 µ (sandy loam and sand soils) screens prior to use. Between 1.8 and 28.4% of the adsorbed chlorothalonil was desorbed from the soils.

3. This study partially fulfills EPA Data Requirements for Registering Pesticides by providing information on the adsorption and desorption of chlorothalonil in four soils.

MATERIALS AND METHODS:

Air-dried silty clay loam and silt soils were sieved through a 250 µ screen, and air-dried sand and sandy loam soils were sieved through a 590 µ screen

EXECUTIVE SUMMARY

The data summarized here are scientifically valid data that have been reviewed in this report but do not fulfill data requirements unless noted in the Recommendations section of this report.

Freundlich K_{ads} values were 26 for a silty clay loam soil, 29 for a silt soil, 20 for a sandy loam soil, and 3 for a sand soil equilibrated with 0.10-.5 ppm of [^{14}C]chlorothalonil (radiochemical purity >97%) in a 1:4 soil:0.03 N calcium sulfate slurry (Capps, No MRID). The soils had been sieved through 250 µ silty clay loam and silt soils) and 590 µ (sandy loam and sand soils) screens prior to use. Between 1.8 and 28.4% of the absorbed chlorothalonil was desorbed from the soils.

Aged [^{14}C]chlorothalonil (radiochemical purity 98.1%) was slightly mobile in sandy loam, silt loam, and clay loam soils, and mobile in sand soil based on soil column studies (Nelsen, No MRID). The [^{14}C]chlorothalonil degradates (7-14 day aging) 3-carboxy-2,5,6-trichlorobenzamide (SDS-46851), 2-hydroxy-5-cyano-3,4,6-trichlorobenzamide (SDS-47525), and 4-hydroxy-2,5,6-trichloroisophthalonitrile (SDS-3701), were mobile in all four soils; 3-cyano-2,5,6- plus 3-cyano-2,4,5-trichlorobenzamide (SDS-47524/3) were mobile in the sandy loam, silt loam, and sand soils.

RECOMMENDATIONS

Available data are insufficient to fully assess the environmental fate and transport of, and the potential exposure of humans and nontarget organisms to chlorothalonil. The submission of data relevant to registration requirements (Subdivision N) for terrestrial food crop and aquatic nonfood use sites is summarized below:

Hydrolysis studies: No data were submitted for this addendum; however, based on data submitted for the Chlorothalonil Registration Standard and the Chlorothalonil Addendum dated October 23, 1985, all data requirements have been fulfilled.

Photodegradation studies in water: No data were submitted for this addendum; however, all data are required.

Photodegradation studies on soil: No data were submitted for this addendum; however, all data are required.

Photodegradation studies in air: No data were submitted for this addendum; however, all data are required.

Aerobic soil metabolism studies: No data were submitted for this addendum; however, based on data submitted for the Chlorothalonil Registration Standard, all data requirements have been fulfilled.

Anaerobic soil metabolism studies: No data were submitted for this addendum. Based on anaerobic aquatic metabolism data submitted for this addendum, all data requirements have been fulfilled.

Anaerobic aquatic metabolism studies: No data were submitted for this addendum; however, based on data submitted for the Chlorothalonil Addendum dated October 23, 1985, all data requirements have been fulfilled.

Aerobic aquatic metabolism studies: No data were submitted for this addendum; however, all data are required depending upon the results from the specialized aquatic uses studies.

Leaching and adsorption/desorption studies: Two studies were submitted for this addendum. One study (Capps, No MRID) partially fulfills data requirements by providing information on the adsorption and desorption of chlorothalonil in four soils. The second study (Nelsen, No MRID) partially fulfills data requirements by providing information on the mobility of aged chlorothalonil in soil.

The Agency is concerned about the contamination of ground water by chlorothalonil and its metabolites. Data required for the evaluation of the potential for contamination of ground water are being required on an accelerated basis.

Laboratory volatility studies: No data were submitted for this addendum; however, vapor pressure data may be considered in determining whether volatility studies are required.

Field volatility studies: No data were submitted for this addendum. The data requirement is deferred pending conclusions relative to the laboratory volatility requirement.

Terrestrial field dissipation studies: No data were submitted for this addendum. Based on data submitted in the Chlorothalonil Registration Standard, an additional study is needed providing terrestrial field dissipation data for chlorothalonil at one additional site for the WP formulation (utilizing the highest rate recommended and the greatest number of multiple applications) and at two additional sites for the D, P/T, Impr, and FlC formulations.

Aquatic field dissipation studies: No data were submitted for this addendum; however, all data may be required depending upon the results from the specialized aquatic use studies.

Forestry dissipation studies: No data were submitted for this addendum; however, no data are required because currently chlorothalonil has no registered forestry uses.

Dissipation studies for combination products and tank mix uses: No data were submitted for this addendum; however, no data are required because data requirements for combination products and tank mix uses are currently not being imposed.

Long-term field dissipation studies: No data were submitted for this addendum. The data requirements for the long-term field dissipation studies will be based on the results of the field dissipation studies utilizing the highest rate recommended and the greatest number of multiple applications.

2M

Confined accumulation studies on rotational crops: No data were submitted for this addendum. Based on data submitted for the Chlorothalonil Registration Standard, all data requirements have been fulfilled.

Field accumulation studies on rotational crops: No data were submitted for this addendum; however, based on confined accumulation studies submitted for the Chlorothalonil Registration Standard, all data are required.

Accumulation studies on irrigated crops: No data were submitted for this addendum; however, no data are required because water containing chlorothalonil residues is not expected to be used to irrigate crops.

Laboratory studies of pesticide accumulation in fish: No data were submitted for this addendum; however, all data may be required depending upon the octanol/water partition coefficient data.

Field accumulation studies on aquatic nontarget organisms: No data were submitted for this addendum; however, all data may be required depending upon the results from the specialized aquatic uses studies.

Reentry studies: No data were submitted for this addendum. The Agency is imposing a 24 hour reentry interval pending the receipt and evaluation of reentry data.

Specialized aquatic use studies: No data were submitted for this addendum. For antifouling paints on ships and related protective or preservative uses, a laboratory study employing nonradioisotopic analytical techniques is required for the determination of movement of residues from treated surfaces into water. When any movement is detected, the data requirements for aquatic noncrop uses apply.

Ancillary studies: One vapor pressure determination study was reviewed (Szalkowski, No MRID).

REFERENCES

Capps, T.M. 1982. Adsorption and desorption of chlorothalonil to soils. Document No. 555-4EF-81-0216-001. Diamond Shamrock Corporation, Painesville, OH. Acc. No. 259753. (No MRID)

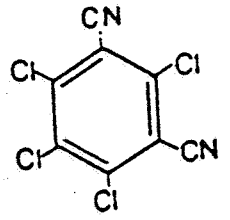
Nelsen, T.R. 1985. An aged soil leaching study with ^{14}C-chlorothalonil (2,4,5,6-tetrachloroisophthalonitrile). Document No. 720-3EF-85-0001-001 SDS Biotech Corporation, Painesville, OH. Acc. No. 259753. (No MRID)

Szalkowski, M.B. 1981. Determination of vapor pressure of 2,4,5,6-tetrachloroisophthalonitrile (chlorothalonil, DS-2787). Document No. 416-3EI-80-0162-001. Diamond Shamrock Corporation, Painesville, OH. Acc. No. 259753. (No MRID)

Environmental Fate and Exposure Assessment

Chlorothalonil

CHLOROTHALONIL, BRAVO, DACONIL 2787
EXOTHERM TERMIL, FORTURF



Tetrachloroisophthalonitrile

The data summarized here are scientifically valid and meet registration requirements.

[^{14}C]3-Cyano-2,4,5,6-tetrachlorobenzamide (97.7% pure), a degradate of chlorothalonil, at 22.6 ppm, was stable to hydrolysis for 30 days in sterile aqueous buffered solutions of pH 5 and 7 maintained at 24 ± 1 C (Nelson, 1985a; No MRID). In solutions of pH 9, ~10% of the applied degraded during 30 days of incubation; 2,4,5,6-tetrachloroisophthalamide was the sole degradate.

Ring-labeled [^{14}C]chlorothalonil (98.8% pure), at 10 ppm, degraded with a half-life of 5-15 days in flooded silt loam and sandy loam soils incubated in the dark at 25 C under a nitrogen atmosphere (Nelson, 1985b; No MRID). Degradates included 4-hydroxy-2,5,6-trichloroisophthalonitrile (42.8 and 17.7% of the recovered in the silt loam and sandy loam soils, respectively), 3-cyano-2,4,5,6-tetrachlorobenzamide (6.7 and 5.9%), 2-hydroxy-5-cyano-3,4,6-trichlorobenzamide (3.5 and 4.4%), and 3-carboxy-2,5,6-trichlorobenzamide (1.2 and 2.6%). Less than 0.1% of the [^{14}C]residues volatilized during the study.

MATERIALS AND METHODS:

Duplicate 4-g samples of sterile (autoclaved twice for 30 minutes at 50 psi and 270 F) and nonsterile soils (Table 1) contained in 20 ml glass scintillation vials were treated with ring-labeled [^{14}C]chlorothalonil in a benzene solution (specific activity 3630 dpm/µg, 99.3% pure, Diamond Shamrock Corp.). The Illinois silt loam, Iowa peat loam, and Texas sandy loam soils were treated at 39 ppm; the Ohio sandy loam was treated at 3.9 ppm. The soil samples were covered with aluminum foil to prevent light exposure and were maintained at 25 C and at 80% of field capacity (distilled water additions).

Two sterile and two nonsterile soil samples were removed at 0, 7, 16, 22, 31, 60, and 90 days posttreatment, air dried, and ground with a mortar and pestle. The samples (~2 g) were extracted one time with 30 ml of acetone: HCl (80:20) and duplicate 0.5-1.0 ml aliquots of the supernatant were radioassayed by using LSC.

A 15-ml portion of the remaining supernatant was evaporated free of acetone under a stream of air, and the remaining acid aqueous portion was transferred to a 60-ml separatory funnel and partitioned into isopropyl ether (20 ml). Duplicate 0.5 ml portions of each phase were quantified by using LSC.

A 15-ml portion of the ether phase was concentrated to a volume <0.5 ml, and applied along with known standards to silica-gel TLC plates. The plates were developed with hexane:acetone (1:1) to a distance 15 cm from the origin, allowed to dry, visualized under UV light, and autoradiographed. Radioactive sections of the TLC plates were then quantified by using LSC.

In a second experiment, [^{14}C]4-hydroxy-2,5,6-trichloroisophthalonitrile (DAC-3701, specific activity 4114 dpm/µg, 98.2% pure, Diamond Shamrock Corp.) was applied at 4.3 ppm to the four test soils (Table 1). Procedures and protocols were the same as described above.

REPORTED RESULTS:

Chlorothalonil concentrations detected in sterile and nonsterile soils are shown in Tables 2 and 3, respectively.

In nonsterile soils, half-lives for chlorothalonil ranged from 22-31, 7-16, 7-16, and 0-7 days in the silt loam, peat loam, Texas sandy loam, and Ohio sandy loam soils, respectively. In sterile soils, half-lives for chlorothalonil ranged from 60-90, 22-31, 7-16, and 16-22 days in the silt loam, peat loam, Texas sandy loam, and Ohio sandy loam soils, respectively.

Concentrations of 4-hydroxy-2,5,6-trichloroisophthalonitrile (DAC-3701) in sterile and nonsterile [^{14}C]chlorothalonil-treated soils reached a maximum of 10-30% of the applied radioactivity at 16-60 days posttreatment. Another degradate, 3-cyano-2,4,5,6-tetrachlorobenzamide, accounted for <7.4% of the applied radioactivity in sterile or nonsterile soils at any sampling interva

[^{14}C]4-Hydroxy-2,5,6-trichloroisophthalonitrile-treated soils showed no degradation in any of four test soils after the 90-day test period.

DISCUSSION:

1. The test soil reported to be a silty clay loam is a silt loam according to the USDA soil texture classification system.

2. It was stated that no degradation of DAC-3701 occurred in soils treated with [^{14}C]DAC-3701 at 4.3 ppm; however, no data were presented to support this position.

Table 1. Soil characteristics.

Soil type	Origin	Sand	Silt	Clay	Organic matter	pH
				%		
Silt loam[a]	Macomb, IL	0.6	73.6	25.8	2.3	5.1
Peat loam	IO	29.7	50.0	20.3	7.2	7.0
Sandy loam	Tulia, TX	54.0	25.0	19.5	1.6	8.0
Sandy loam	Painesville, OH	62.2	31.0	6.8	3.2	6.0

[a]Reported as a silty clay loam; see Discussion No. 1.

Table 2. Chlorothalonil degradation (% of applied) in sterile soils.[a]

Sampling interval (days)	Chlorothalonil	DAC-3701[b]	DS-19221[c]	Water soluble	Nonextractable
			Silt loam soil		
0	95.3	0	0	1.3	2.1
7	94.9	1.9	0	0.7	2.6
16	86.6	2.1	0.1	3.3	8.0
22	88.1	2.8	0	1.8	4.6
31	80.9	3.1	0	3.2	9.5
60	78.4	4.3	0	1.7	11.0
90	45.0	5.5	0.1	5.2	40.3
			Peat loam soil		
0	90.8	0	0	1.5	7.5
7	74.3	3.5	0.6	3.1	19.5
16	64.0	7.2	0.3	3.5	26.0
22	54.2	10.4	0.4	3.0	28.4
31	51.3	9.4	0.1	3.8	31.6
60	19.5	13.7	1.5	3.0	41.3
90	13.9	7.6	0.5	6.8	61.9
			Texas sandy loam soil		
0	99.5	0	0	0.9	0.4
7	67.4	3.1	0.1	0.8	28.0
16	50.2	4.3	0.5	1.0	42.3
22	42.7	5.5	1.4	1.7	46.0
31	41.7	9.2	0.5	2.7	44.4
60	21.0	8.2	0.4	1.3	62.2
90	8.1	5.6	0.1	4.5	74.8
			Ohio sandy loam soil		
0	83.5	0	0	1.6	13.1
7	90.5	5.1	0.3	2.7	1.9
16	61.3	6.2	1.3	14.3	24.5
22	41.5	6.4	3.0	12.0	30.1
31	67.2	4.8	0.7	9.0	13.0
60	24.9	7.6	1.5	11.1	35.4
90	5.7	4.2	2.3	18.6	62.9

[a]Average of duplicate samples.

[b]4-Hydroxy-2,5,6-trichloroisophthalonitrile.

[c]3-Cyano-2,4,5,6-tetrachlorobenzamide.

Table 3. Chlorothalonil degradation (% of applied) in non-sterile soils.[a]

Sampling interval (days)	Chlorothalonil	DAC-3701[b]	OS-19221[c]	Water soluble	Nonextractable
			Silt loam soil		
0	94.8	0	0	1.2	3.5
7	80.9	8.1	0.4	3.3	7.7
16	67.2	12.0	1.0	8.5	15.4
22	62.4	13.2	0.7	5.7	12.1
31	46.5	16.0	1.4	7.1	16.4
60	51.1	13.4	1.9	5.2	16.9
90	33.3	10.5	1.0	9.5	41.7
			Peat loam soil		
0	97.6	0	0	1.8	3.2
7	61.6	13.6	3.1	3.7	17.5
16	42.4	23.8	3.9	7.4	22.6
22	34.3	24.5	4.4	6.7	24.8
31	23.9	28.1	4.9	14.3	24.5
60	14.4	31.9	5.2	6.6	28.7
90	6.0	18.0	2.8	12.2	51.9
			Texas sandy loam soil		
0	100.2	0	0	0.7	0.2
7	60.2	15.1	1.0	5.2	17.1
16	36.4	26.2	1.7	7.0	35.2
22	30.7	26.1	1.3	10.0	26.3
31	26.0	23.3	1.8	8.3	34.6
60	12.8	27.4	2.3	8.4	32.6
90	4.6	13.5	0.8	10.5	62.8
			Ohio sandy loam soil		
0	92.2	0	0	1.1	3.4
7	44.8	12.5	7.4	19.8	25.5
16	32.2	15.0	7.4	22.5	31.3
22	21.1	11.2	5.1	22.8	26.2
31	11.2	7.3	6.1	26.5	35.4
60	10.8	11.6	2.6	17.2	34.5
90	4.8	6.3	3.1	24.5	56.0

[a]Average of duplicate samples.

[b]4-Hydroxy-2,5,6-trichloroisophthalonitrile.

[c]3-Cyano-2,4,5,6-tetrachlorobenzamide.