Test Material:	Tribenuron methyl
MRID:	49378203
Title:	Analytical Method for the Determination of Tribenuron Methyl and metabolites IN-L5296, IN-A4098, IN-D5119, and IN-00581 in Water Using LC/MS/MS
MRID:	49378205
Title:	Independent Laboratory Validation of DuPont-5856, "Analytical Method for the Determination of Tribenuron Methyl and Metabolites IN-L5296, IN-A4098, IN-D5119, and IN-00581 in Water Using LC/MS/MS"
EPA PC Code:	128887
OCSPP Guideline:	850.6100

For CDM Smith

Primary Reviewer: Lynne Binari **Signature:** 

Date: 10/30/14

Secondary Reviewer: Lisa Muto **Signature:** 

Date: 10/30/14

QC/QA Manager: Joan Gaidos **Signature:** 

Date: 10/30/14

Analytical method for tribenuron methyl and its products IN-L5296, IN-A4098, IN-D5119, and IN-00581 in water

Reports:	ECM: EPA MRID No.: 49378203. Gagnon, M., and J. Stry. 2001. Analytical Method for the Determination of Tribenuron Methyl and Metabolites IN-L5296, IN-A4098, IN-D5119, and IN-00581 in Water Using LC/MS/MS. DuPont Project ID: DuPont-5856. Report prepared by E. I. du Pont de Nemours and Company, DuPont Crop Protection, Stine-Haskell Research Center, Newark, Delaware, sponsored and submitted by E. I. du Pont de Nemours and Company, Wilmington, Delaware; 75 pages. Final report issued July 20, 2001. ILV: EPA MRID No. 49378205. Willoh, J. 2013. Independent Laboratory Validation of DuPont-5856, "Analytical Method for the Determination of Tribenuron Methyl and Metabolites IN-L5296, IN-A4098, IN-D119, and In-00581 in Water Using LC/MS/MS". Morse Project No.: 80140. DuPont Study No.: DuPont-36611. Report prepared by Morse Laboratories, LLC, Sacramento, California, sponsored and submitted by E. I. du Pont de Nemours and Company, Wilmington, Delaware; 265 pages. Final report issued September 9, 2013.
Document No.:	MRIDs 49378203 & 49378205
Guideline:	850.6100 EC SANCO/825/00 rev. 6 (p. 26 of MRID 49378203) OECD ENV/JM/MONO (2007) 17 and EC SANCO/825/00 rev. 8.1 (p. 13 of MRID 49378205)
Statements:	ECM: Method development work was not done under Good Laboratory Practice (GLP) standards; analytical procedures, documentation and archiving of the validation data were done according to Standard Operating Procedures (p. 3 of MRID 49378203). Signed and dated Data Confidentiality, GLP, and Authenticity Certification statements were provided (pp. 2-4). A Quality Assurance statement was not provided. ILV: The study was conducted in compliance with USEPA GLP standards (p. 3 of MRID 49378205). Signed and dated Data Confidentiality, GLP, Quality Assurance, and Authenticity Certification statements were provided (pp. 2-5).
Classification:	This analytical method is classified as **Acceptable**. The determinations of the LOQ and LOD were not based on scientifically acceptable procedures.
PC Code:	128887
Reviewer:	Jerrett Fowler, Physical Scientist

Signature: Jerrett Fowler 2019.07.01 10:11:43 -04'00'
Date: 7/01/2019

Executive Summary

This analytical method, DuPont-5856, is designed for the quantitative determination of tribenuron methyl and its products IN-L5296, IN-A4098, IN-D5119, and IN-00581 in ground water, surface water and drinking water using HPLC/MS/MS. The method is quantitative for the analytes at the stated LOQs of 0.05 µg/L for tribenuron methyl, IN-L5296, and IN-A4098, and 0.10 µg/L for IN-D5119 and IN-00581. The LOQ is less than the lowest toxicological level of concern in water. The independent laboratory validated the method for analysis of tribenuron methyl, IN-L5296, IN-A4098, and IN-00581 in ground water, surface water and drinking water at both fortification levels after one trial. The method was validated for IN-D5119 in ground water and surface water at both fortification levels after one trial and in drinking water after a second trial. No major modifications were made by the independent laboratory.

Table 1. Analytical Method Summary

Analyte(s) by Pesticide	MRID		EPA Review	Matrix[1]	Method Date (dd/mm/yyyy)	Registrant	Analysis	Limit of Quantitation (LOQ)
	Environmental Chemistry Method	Independent Laboratory Validation						
Tribenuron methyl	49378203	49378205		Water	20/07/2001	E. I. du Pont de Nemours and Company	HPLC/MS/MS	0.05 µg/L
IN-L5296								0.05 µg/L
IN-A4098								0.05 µg/L
IN-D5119								0.10 µg/L
IN-00581								0.10 µg/L

I. Principle of the Method

Tribenuron methyl, IN-L5296, and IN-A4098:
Water (200.0 mL, ± 1%) was loaded under vacuum (2-10 mL/minute) onto a Waters Oasis HLB solid phase extraction (SPE) cartridge (1 g/20 cc) pre-conditioned with methanol and water (pp. 10, 16 of MRID 49378203). The sample container was rinsed with water and the rinsate applied to the loaded cartridge, then the cartridge was washed with hexane. Residues were eluted (gravity flow) with acetonitrile:1.0M ammonia hydroxide (98:2, v:v, 15 mL; pp. 13, 16). Water (1 mL) was added to the eluate, then concentrated to *ca*. 0.5 mL under nitrogen at 25-30°C to remove solvent. The concentrated sample was brought to 10 mL with water and an aliquot filtered (0.2-µm) for LC/MS/MS analysis.

Method precautions: Tribenuron methyl is unstable in aqueous acidic solutions (p. 24 of MRID 49378203). IN-A4098 cannot be consistently reconstituted from glass or plastic centrifuge tubes. If the sample extract is taken to dryness, the sample must be re-extracted.

Samples were analyzed for tribenuron methyl and its products IN-L5296 and IN-A4098 by HPLC (Phenomenex Aqua, 4.6 mm x 15 cm, 40°C) using a mobile phase of (A) 0.005M aqueous formic acid and (B) methanol [percent A:B (v:v) at 0.0-1.0 min. 90:10, 3.5 min. 70:30, 12.0 min. 20:80, 12.5-14.5 min. 5:95, 15.0 min. 90:10] with MS/MS-ESI (electrospray ionization, positive ion mode) detection and multiple reaction monitoring (MRM; pp. 10, 17-20 of MRID 49378203). Injection volume was 75 µL. Analytes were identified using two ion transitions; one for quantitation (Q) and one for confirmation (C). Ion transitions monitored were as follows: *m/z* 395.8→154.9 ± 0.2 (Q) and *m/z* 395.8→180.9 ± 0.2 (C) for tribenuron methyl, *m/z* 155.0→71.0 ± 0.2 (Q) and *m/z*

155.0→56.9 ± 0.2 (C) for IN-L5296, and *m/z* 141.0→57.0 ± 0.2 (Q) and *m/z* 141.0→85.8 ± 0.2 (C) for IN-A4098.

IN-D5119 and IN-00581:
Water (50.0 mL, ± 1%) was acidified with acetic acid (50 µL), then loaded under vacuum (2-10 mL/minute) onto a Waters Oasis HLB SPE cartridge (1 g/20 cc) pre-conditioned with methanol and 0.1% aqueous acetic acid (pp. 10, 13, 17 of MRID 49378203). The sample container was rinsed with 0.1% aqueous acetic acid and the rinsate applied to the loaded cartridge. The loaded cartridge was then washed with water:methanol:acetic acid (70:30:0.1, v:v:v) followed by water. Residues were eluted (gravity flow) with methanol:water (70:30, v:v, 20 mL). The eluate was concentrated to *ca*. 6.0 mL under nitrogen at 25-30°C. The concentrated sample was brought to 8 mL with water (20 mL for 10x fortifications) and an aliquot filtered (0.2-µm) for LC/MS/MS analysis.

Samples were analyzed for IN-D5199 and IN-00581 by HPLC (Phenomenex Aqua, 4.6 mm x 15 cm, 25°C) using a mobile phase of (A) 0.005M aqueous formic acid and (B) methanol [percent A:B (v:v) at 0.0-1.0 min. 90:10, 3.5 min. 70:30, 12.0 min. 20:80, 12.5-15.5 min. 10:90, 16.5 min. 90:10] with MS/MS-ESI (negative ion mode) detection and MRM (pp. 17-20 of MRID 49378203). Injection volume was 20 µL. Quantitation (Q) and confirmation (C) ion transitions monitored were as follows: *m/z* 199.9→155.8 ± 0.2 (Q) and *m/z* 199.9→91.8 ± 0.2 (C) for IN-D5119 and *m/z* 181.9→41.8 ± 0.2 (Q) and *m/z* 181.9→105.8 ± 0.2 (C) for IN-00581.

All analytes:
The ILV performed the method as written with minor method modifications and suitable equipment and instrumentation substitutions, with none considered a substantial change to the ECM (pp. 21-27 of MRID 49378205).

LOQs and LODs were the same in the ECM and ILV (p. 23 of MRID 49378203; p. 17 of MRID 49378205). LOQs were 0.050 µg/L for tribenuron methyl, IN-L5296, and IN-A4098, and 0.10 µg/L for IN-D5119 and IN-00581. LODs were estimated at *ca*. 0.005 µg/L for tribenuron methyl, IN-L5296, and IN-A4098, and 0.03 µg/L for IN-D5119 and IN-00581.

II. Recovery Findings

ECM (MRID 49378203): Mean recoveries and relative standard deviations (RSDs) were within guidelines (mean 70-120%; RSD ≤20%) for analysis of tribenuron methyl and its products IN-L5296 and IN-A4098 in ground (well) water, surface (pond and river) water, and drinking (bottled spring) water at fortification levels of 0.05 µg/L (LOQ) and 0.50 µg/L (10x LOQ), and for analysis of products IN-D5119 and IN-00581 in the four matrices at fortification levels of 0.10 µg/L (LOQ) and 1.0 µg/L (10x LOQ, p. 23 of MRID 49378203). Analytes were identified and quantified using two ion transitions. Performance data (recovery results) from confirmation ion analyses were not reported. For confirmation, ion ratio differences [comparison of the confirmation ratio (quantitation ion peak area/confirmation ion peak area) of the recovery sample with the average confirmation ratio of the standards, pp. 24-25] were reported as ≤30% (validity criteria defined by laboratory) for all analytes at both fortification levels in the four water matrices; however, quantitative data were only provided for pond water fortified with the analytes (p. 25; Appendix 3, pp. 61-65). The primary source of each water matrix was reported (p. 15), but characterizations were not provided.

ILV (MRID 49378205): Mean recoveries and relative standard deviations (RSDs) were within guidelines (mean 70-120%; RSD ≤20%) for analysis of tribenuron methyl and its products IN-L5296 and IN-A4098 in ground (well) water, surface (river) water, and drinking (tap) water at fortification levels of 0.05 µg/L (LOQ) and 0.50 µg/L (10x LOQ), and for analysis of products IN-D5119 and IN-00581 in the three matrices at fortification levels of 0.10 µg/L (LOQ) and 1.0 µg/L (10x LOQ, pp. 31-33 of MRID 49378205). Analytes were identified and quantified using two ion transitions; quantitation ion and confirmation ion recovery results were comparable. The method was validated for tribenuron methyl and its products IN-L5296, IN-A4098, and IN-00581 in ground water, surface water and drinking water at both fortification levels after one trial, with minor method and instrument parameter modifications (pp. 21-23, 30-31). The method was validated for product IN-D5119 in ground water and surface water at both fortification levels after one trial and in drinking water after a second trial. The water matrices were fully characterized and screened for interferences prior to use (pp. 21, 30; Appendix 2, pp. 162-176; Appendix 6, pp. 263-265).

Table 2. Initial Validation Method Recoveries for Tribenuron methyl and Its Products IN-L5296, IN-A4098, IN-D5119, and IN-00581 in Water[1]

Analyte	Fortification Level (µg/L)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
	Surface (Pond) Water					
Tribenuron methyl	0.05 (LOQ)	5	86-95	91	4	4
	0.50	5	83-101	95	7	8
IN-L5296	0.05 (LOQ)	5	89-100	95	5	5
	0.50	5	89-94	91	2	2
IN-A4098	0.05 (LOQ)	5	89-94	92	2	2
	0.50	5	87-90	89	2	2
IN-D5119	0.10 (LOQ)	5	80-109	92	12	13
	1.0	5	86-122	98	14	15
IN-00581	0.10 (LOQ)	5	77-95	85	7	8
	1.0	5	80-89	83	4	5
	Surface (River) Water					

Analyte	Fortification Level (µg/L)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
Tribenuron methyl	0.05 (LOQ)	5	96-108	102	5	5
	0.50	5	97-101	99	2	2
IN-L5296	0.05 (LOQ)	5	93-101	96	3	4
	0.50	5	90-95	93	2	2
IN-A4098	0.05 (LOQ)	5	95-100	97	2	2
	0.50	5	89-92	90	1	1
IN-D5119	0.10 (LOQ)	5	77-119	88	17	20
	1.0	5	82-114	99	15	15
IN-00581	0.10 (LOQ)	5	79-114	100	15	15
	1.0	5	83-99	90	6	7
	Ground (Well) Water					
Tribenuron methyl	0.05 (LOQ)	5	97-107	102	4	4
	0.50	5	83-95	88	5	5
IN-L5296	0.05 (LOQ)	5	84-101	94	6	7
	0.50	5	75-97	89	9	10
IN-A4098	0.05 (LOQ)	5	90-104	99	6	6
	0.50	5	79-96	90	7	8
IN-D5119	0.10 (LOQ)	5	87-100	94	6	6
	1.0	5	85-109	95	9	10
IN-00581	0.10 (LOQ)	5	74-110	95	14	15
	1.0	5	82-98	90	7	7
	Drinking (Bottled Spring) Water					
Tribenuron methyl	0.05 (LOQ)	5	98-107	102	4	4
	0.50	5	90-97	94	3	3
IN-L5296	0.05 (LOQ)	5	95-106	102	4	4
	0.50	5	88-96	93	4	4
IN-A4098	0.05 (LOQ)	5	99-108	104	3	3
	0.50	5	88-93	91	3	3
IN-D5119	0.10 (LOQ)	5	75-107	87	13	15
	1.0	5	80-113	89	14	15
IN-00581	0.10 (LOQ)	5	97-119	106	10	9
	1.0	5	78-110	95	14	14

Data (quantitation ion results, uncorrected) were obtained from Table 1, pp. 27-34 of MRID 49378203 and DER Attachment 2 (standard deviations). Example calculations allow for the correction of recovery results; however, no residues were detected in the matrix controls (p. 21; Table 1, pp. 27-34 of MRID 49378203).

1 Matrix characterizations were not provided. Surface waters were obtained from Lums Pond, Bear, Delaware, and Brandywine River, Wilmington, Delaware (p. 15 of MRID 49378203). Ground water was obtained from Kemblesville Well, Kemblesville, Pennsylvania. Drinking water was purchased bottled spring water, Great Bear, Greenwich, Connecticut.

Table 3. Independent Validation Method Recoveries for Tribenuron methyl and its products IN-L5296, IN-A4098, IN-D5119, and IN-00581 in Water[1]

Analyte	Fortification Level (µg/L)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
	Ground (Well) Water					
	Quantitation ion					
Tribenuron methyl	0.05 (LOQ)	5	74-107	87	12	14
	0.50	5	97-118	107	8.6	8.0
IN-L5296	0.05 (LOQ)	5	85-106	95	8.0	8.4
	0.50	5	101-113	105	4.9	4.7
IN-A4098	0.05 (LOQ)	5	95-98	97	1.3	1.4
	0.50	5	92-109	97	6.9	7.1
IN-D5119	0.10 (LOQ)	5	100-114	109	5.6	5.1
	1.0	5	105-114	109	3.6	3.3
IN-00581	0.10 (LOQ)	5	81-120	106	15	14
	1.0	5	105-117	109	4.8	4.4
	Confirmation ion					
Tribenuron methyl	0.05 (LOQ)	5	72-101	83	11	14
	0.50	5	95-112	104	7.4	7.1
IN-L5296	0.05 (LOQ)	5	86-103	96	7.4	7.7
	0.50	5	100-114	104	5.5	5.3
IN-A4098	0.05 (LOQ)	5	92-105	100	5.3	5.3
	0.50	5	89-107	95	7.2	7.6
IN-D5119	0.10 (LOQ)	5	97-107	101	3.8	3.7
	1.0	5	102-110	106	2.9	2.8
IN-00581	0.10 (LOQ)	5	86-117	106	12	11
	1.0	5	105-120	113	6.2	5.5
	Surface (River) Water					
	Quantitation ion					
Tribenuron methyl	0.05 (LOQ)	5	89-100	95	5.1	5.3
	0.50	5	100-110	105	4.5	4.2
IN-L5296	0.05 (LOQ)	5	89-105	98	6.3	6.5
	0.50	5	102-121	114	7.2	6.3
IN-A4098	0.05 (LOQ)	5	89-107	101	7.6	7.5
	0.50	5	95-110	102	6.2	6.1
IN-D5119	0.10 (LOQ)	5	116-120	118	1.8	1.5
	1.0	5	98-108	102	4.3	4.2
IN-00581	0.10 (LOQ)	5	105-118	112	4.7	4.2
	1.0	5	98-110	103	4.8	4.6
	Confirmation ion					
Tribenuron methyl	0.05 (LOQ)	5	84-103	92	8.8	9.5
	0.50	5	92-104	98	4.3	4.4
IN-L5296	0.05 (LOQ)	5	88-107	95	7.3	7.7
	0.50	5	99-119	110	7.9	7.1
IN-A4098	0.05 (LOQ)	5	90-120	103	11	11
	0.50	5	94-105	100	5.0	5.0
IN-D5119	0.10 (LOQ)	5	101-122	112	8.4	7.5
	1.0	5	97-109	103	4.6	4.5
IN-00581	0.10 (LOQ)	5	90-119	110	13	12
	1.0	5	93-112	102	8.6	8.5

Analyte	Fortification Level (µg/L)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
	Drinking (Tap) Water					
	Quantitation ion					
Tribenuron methyl	0.05 (LOQ)	5	98-125	109	11	9.7
	0.50	5	107-116	111	3.6	3.2
IN-L5296	0.05 (LOQ)	5	94-114	103	9.3	9.0
	0.50	5	94-99	97	1.9	1.9
IN-A4098	0.05 (LOQ)	5	95-115	102	7.7	7.6
	0.50	5	86-93	90	2.6	2.9
IN-D5119	0.10 (LOQ)	5	79-102	92	11	12
	1.0	5	79-92	85	4.9	5.7
IN-00581	0.10 (LOQ)	5	87-114	99	12	12
	1.0	5	85-92	88	3.5	4.0
	Confirmation ion					
Tribenuron methyl	0.05 (LOQ)	5	97-127	109	12	11
	0.50	5	104-113	109	4.4	4.0
IN-L5296	0.05 (LOQ)	5	99-119	105	7.8	7.4
	0.50	5	92-102	98	3.9	4.0
IN-A4098	0.05 (LOQ)	5	99-121	105	9.7	9.2
	0.50	5	88-94	91	2.8	3.1
IN-D5119	0.10 (LOQ)	5	81-95	87	6.4	7.4
	1.0	5	78-87	84	3.6	4.3
IN-00581	0.10 (LOQ)	5	83-108	100	10	10
	1.0	5	78-94	88	6.2	7.1

Data (uncorrected recoveries, no residues were detected in matrix controls) were obtained from Tables 1-2, pp. 38-39; Tables 4-5, pp. 41-42; Tables 7-8, pp. 44-45; Tables 10-11, pp. 47-48; Tables 13-14, pp. 50-51; Tables 16-17, pp. 53-54; Tables 19-20, pp. 56-57; Tables 22-23, pp. 59-60; Tables 25-26, pp. 62-63; Tables 28-29, pp. 65-66; Tables 31-32, pp. 68-69; Tables 34-35, pp. 71-72; Tables 37-38, pp. 74-75; Tables 40-41, pp. 77-78; Tables 43-44, pp. 80-81 of MRID 49378205.

1 Matrix characterizations were provided (Appendix 6, pp. 263-265 of MRID 49378205). Ground (well) water was obtained from Cool, California (p. 21 of MRID 49378205). Surface water was obtained from the American River, Gold River, California. Drinking water was tap water from Morse Laboratories, Sacramento, California.

III. Method Characteristics

LOQs and LODs were the same in the ECM and ILV (p. 23 of MRID 49378203; p. 17 of MRID 49378205). LOQs were 0.050 µg/L for tribenuron methyl, IN-L5296, and IN-A4098, and 0.10 µg/L for IN-D5119 and IN-00581. The ECM defined the LOQ as the lowest fortification level at which acceptable average recoveries (70-120%, RSD <20%) were achieved, and the fortification level at which analyte peaks were consistently produced at a level *ca*. 10-20 times the signal at the corresponding retention time of the analyte in an untreated matrix control sample (p. 23; Figures 5-6, pp. 52-53 of MRID 49378203). LODs were estimated at *ca*. 0.005 µg/L for tribenuron methyl, IN-L5296, and IN-A4098, and 0.03 µg/L for IN-D5119 and IN-00581. The ECM estimated the LODs as *ca*. 3x background noise at the corresponding retention time of the least responsive analyte, IN-A4098 or IN-D5119, or *ca*. one-third of the LOQ. In ILV analyses, IN-00581 was the least responsive analyte (p. 34; Appendix 5, pp. 253-261 of MRID 49378205).

Table 4. Method Characteristics for Tribenuron methyl and Its Products IN-L5296, IN-A4098, IN-D5119, and IN-00581 in Water

	Tribenuron methyl	IN-L5296	IN-A4098	IN-D5119	IN-00581
Limit of Quantitation (LOQ)	0.050 µg/L			0.10 µg/L	
Limit of Detection (LOD)	0.005 µg/L			0.03 µg/L	
Linearity (1/x weighting, calibration curve r^2 and concentration range)[1]	Q ion: r^2 = **0.985**-0.999 C ion: r^2 = **0.979**-0.999	Q ion: r^2 = 0.995-0.999 C ion: r^2 = 0.996-1.000	Q ion: r^2 = 0.997-0.998 C ion: r^2 = 0.997-0.999	Q ion: r^2 = **0.986**-0.998 C ion: r^2 = **0.987**-0.997	Q ion: r^2 = **0.989-0.993** C ion: r^2 = **0.988-0.992**
	0.50-20 ng/mL			0.50-3.0 ng/mL	
Repeatable	Yes			Yes	
Reproducible	Yes			Yes	
Specific	Yes			Yes	

Data were obtained from p. 23 of MRID 49378203; p. 17 of MRID 49378205.

1 Linearity of ILV calibration curves was verified by the reviewer, and r^2 values were derived from reported r values (Figures 5-9, pp. 104-108 and Appendix 2, pp. 177-206 of MRID 49378205; DER Attachment 2). ECM standard curves were not provided.

IV. Method Deficiencies and Reviewer's Comments

1. The determination of the LOQ and LOD were not based on scientifically acceptable procedures as defined in 40 CFR Part 136, Appendix B. LOQs and LODs for the analytes were the same in the ECM and ILV. LOQs were 0.050 µg/L for tribenuron methyl, IN-L5296, and IN-A4098, and 0.10 µg/L for IN-D5119 and IN-00581 (p. 23 of MRID 49378203; p. 17 of MRID 49378205). LODs were estimated at *ca*. 0.005 µg/L for tribenuron methyl, IN-L5296, and IN-A4098, and 0.03 µg/L for IN-D5119 and IN-00581. The ECM defined the LOQ as the lowest fortification level at which acceptable average recoveries (70-120%, RSD <20%) were achieved, and the fortification level at which analyte peaks were consistently produced at a level *ca*. 10-20 times the signal at the corresponding retention time of the analyte in an untreated matrix control sample (p. 23; Figures 5-6, pp. 52-53 of MRID 49378203). The ECM estimated the LOD as *ca*. 3x background noise at the corresponding retention time of the least responsive analyte, IN-A4098 or IN-D5119, or *ca*. one-third of the LOQ. In ILV analyses, IN-00581 was the least responsive analyte (p. 34; Appendix 5, pp. 253-261 of MRID 49378205).

   Detection limits should not be based on the arbitrarily selected lowest concentration in the spiked samples. Additionally, the lowest toxicological level of concern in water was not reported. An LOQ above toxicological levels of concern results in an unacceptable method classification. The ECM study authors did report that the LOQs used for tribenuron methyl, IN-L5296, IN-A4098, IN-D5119, and IN-00581 are all lower than EU requirements for monitoring water (p. 23 of MRID 49378203).

2. The ECM calculations allow for correction of sample recoveries for any residues detected in the reagent blank/matrix control samples; however, for both the ECM and ILV, no residues were detected in the control samples (Table 1, pp. 27-34 of MRID 49378203; Appendix 2, pp. 177-206 of MRID 49378205).

3. For the ECM, the study authors reported interferences, under quantitation ion conditions, were <LOD at the retention times of tribenuron methyl and its products in the matrix control samples; however, for IN-00581 (saccharin) interferences were reported as near the LOD in ground water and surface water matrices (p. 22; Figure 4, pp. 40, 43, 46, 49 of MRID 49378203). The reviewer could not satisfactorily evaluate the study authors' statements as detector signal peaks were reported as 0 to 100%, rather than measured intensity (cps).

   For the ILV quantitation ion analyses, baseline noise was apparent under IN-L5296, IN-A4098 and IN-D5119 conditions in all three water matrices (Figure 10, pp. 109-113; Figure 13, pp. 124-128; Figure 16, pp. 139-143 of MRID 49378205). However, the water matrices were screened for interferences prior to use, and only samples free of interferences (<30% of LOQ) at the corresponding elution times of the analytes were utilized (p. 30; Appendix 2, pp. 162-176).

4. For the ECM, quantitation ion analysis standard curves were not provided, and chromatograms of all calibration standard concentrations were not provided. For both the ECM and ILV, quantitation ion analysis chromatograms of reagent blank samples were not provided.

5. For the ILV, linearity (r^2) of the calibration standards was not always ≥0.995 (see Table 4 above).

6. For the ECM, the primary source of each water matrix was reported, but characterizations were not provided (p. 15 of MRID 49378203). The ECM was performed using ground (well), surface (pond and river), and drinking (bottled spring) water matrices. The ILV was performed using ground (well), surface (river), and drinking (tap) water matrices (characterized) which were collected by Morse Labs (p. 21; Appendix 6, pp. 263-265 of MRID 49378205). DuPont approved use of the water matrices collected by Morse Labs (Appendix 3, pp. 214-215 of MRID 49378205).

7. For the ECM, the test compounds (analytical reference standards) were prepared by DuPont Crop Protection, Global Technology Division, E. I. du Pont de Nemours and Company; however, the analytical purities were not reported (p. 12 of MRID 49378203).

8. It was reported for the ILV that one analyst could complete a set of thirteen samples in one 8-hour day with LC/MS/MS analysis performed overnight (p. 17 of MRID 49378205).

V. References

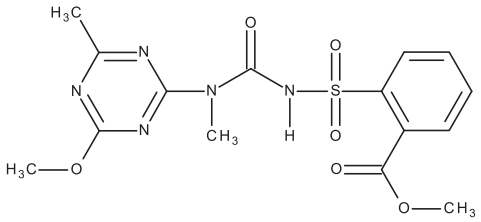
U.S. Environmental Protection Agency. 2012. Ecological Effects Test Guidelines, OCSPP 850.6100, Environmental Chemistry Methods and Associated Independent Laboratory Validation. Office of Chemical Safety and Pollution Prevention, Washington, DC. EPA 712-C-001.

40 CFR Part 136. Appendix B. Definition and Procedure for the Determination of the Method Detection Limit-Revision 1.11, pp. 317-319.

Attachment 1: Chemical Names and Structures

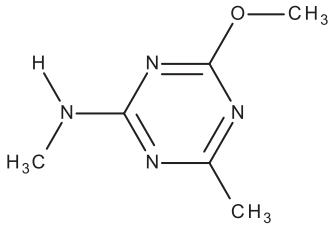
Tribenuron methyl (DPX-L5300)

IUPAC Name: Methyl 2-[4-methoxy-6-methyl]-1,3,5-triazin-2-yl(methyl)carbamoyl sulfamoyl]benzoate
CAS Name: Methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)methylamino] carbonyl]amino]sulfonyl]benzoate
CAS Number: 101200-48-0
SMILES String: COC(=O)c1ccccc1S(=O)(=O)NC(=O)N(C)c2nc(OC)nc(C)n2



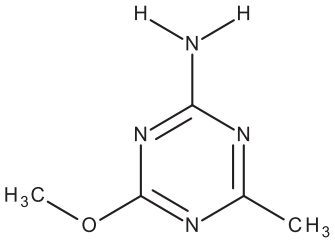
IN-L5296

IUPAC Name: 4-Methoxy-6-methyl-1,3,5-triazin-methylamine
CAS Name: Not reported.
CAS Number: Not reported.
SMILES String: [H]N(C)c1nc(nc(n1)OC)C



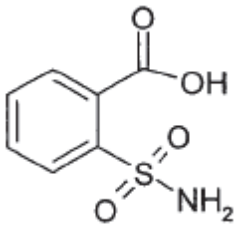
IN-A4098

IUPAC Name: Not reported.
CAS Name: 2-Amino-4-methoxy-6-methyl-1,3,5-triazine
CAS Number: 1668-54-8
SMILES String: [H]N([H])c1nc(nc(n1)OC)Cl



IN-D5119

IUPAC Name: 2-(Aminosulfonyl) benzoic acid
CAS Name: Not reported.
CAS Number: Not reported.
SMILES String:



IN-00581 (Saccharin)

IUPAC Name: 1,1-Dioxide-1,2-benzisothiazol-3(2H)-one
CAS Name: 1,2-Benzisothiazol-3(2H)-one,1,1-dioxide
CAS Number: 81-07-2
SMILES String: [H]N1C(=O)c2ccccc2S1(=O)=O