Data Evaluation Report on the anaerobic biotransformation of iodomethane (TM-425) in water-sediment system

PMRA Submission Number {.....} EPA MRID Number 45593708

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Test material:
Common name: Iodomethane.
Chemical name
IUPAC: Not reported.
CAS name: Iodomethane.
CAS No: 74-88-4.
synonyms: Methyl iodide.
TM-425.
SMILES string: CI

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EXECUTIVE SUMMARY

The biotransformation of [^{14}C]methyl iodide (iodomethane) was studied in a water sandy clay loam sediment system (water pH 7.94, total organic carbon 6.72 mg/L, dissolved organic carbon 6.93 mg/L; sediment pH 8.0, organic matter 2.08%) from California for 14 days under anaerobic conditions in darkness at 20 ±1°C. [^{14}C]Iodomethane was applied at the rate of 13 mg a.i./L water. The sediment:water ratio used was 1:3 (50 g dry wt. sediment:150 mL water). This experiment was conducted in accordance with USEPA Subdivision N Guideline §162-3 and in compliance with the 40 CFR Part 160 GLP standards. The test system consisted of sealed glass bottles containing treated water-sediment incubated under nitrogen atmosphere in darkness in a temperature-controlled chamber; each bottle was connected to a flow-through system for the continuous collection of CO_2 and volatile organics. Water and sediment were pre-incubated for 22 days, then following treatment, water and sediment were analyzed after 0, 4, 8, 24, 48, 72, 96, 168, 240 and 336 hours of incubation. Water and sediment samples were separately heated and purged with air. Heated purge trapping solutions, purged water and sediment, and volatiles trapping solutions from the incubation were analyzed for total radioactivity using LSC. Heated purge and volatiles trapping solutions (2% tripropylamine in dimethyl sulfoxide) were quantitatively analyzed for [^{14}C]methyltripropylammonium ion, the derivative of iodomethane formed via reaction with tripropylamine, using reverse-phase HPLC and identified by comparison to derivatized reference standard. Identification of derivatized iodomethane was confirmed using LC/MS-ESI. Purged water samples were analyzed using cation-exchange HPLC and identification of [^{14}C]methanol in the samples was based on cochromatography with labeled reference standard.

Test conditions outlined in the study protocol were maintained throughout the study; redox potentials in the water layers and at the water-sediment interface ranged from -178.6 to -275.3 mV during the pre-incubation period and following treatment.

Overall material balance averaged 89.2 ± 7.6% (range 77.1-103.1%, n = 21) of the applied radioactivity; material balances steadily declined during the 14-day study. Following application of [^{14}C]iodomethane to the surface of the water layer, [^{14}C]residues partitioned into the sediment with average distribution ratios (water:sediment) of 9:1 at day 0 (0-8 hours), 5:1 at 1 day, 2:1 at 4 days, 1:1 at 7 days and 1:2 at 14 days.

[^{14}C]Iodomethane (as [^{14}C]methyltripropylamine) in the total system decreased from 93.7-99.8% of the applied at time 0 posttreatment to 50.9-51.8% at 1 day, 22.2-25.1% at 3 days, 0.9-6.1% at 7 days and was 0.1-1.1% at 14 days. [^{14}C]Iodomethane, detected primarily in the water layer, decreased from 84.8-89.6% at time 0 to 45.0-46.0% at 1 day, 19.9-23.6% at 3 days, 0.8-5.1% at 7 days and was 0.1-1.0% at 14 days. [^{14}C]Iodomethane in the sediment decreased from 7.6-10.3% at 0-4 hours to 3.6-6.0% at 8-48 hours, 1.4-2.3% at 3-4 days and was ≤1.0% at 7-14 days.

No major transformation products of [^{14}C]iodomethane were detected in the water layers or sediment extracts. One minor transformation product, methanol, was detected in the water layers at ≤4.8% of the applied. Minor products detected following the heated purge of the water layer and sediment were

$^{14}CO_2$ and other unidentified volatile [^{14}C]organics detected at ≤0.8% of the applied radioactivity (combined). Extractable (heated purge) [^{14}C]residues in the sediment decreased from 7.6-10.3% of the applied at time 0 to ≤0.1% at 14 days, while nonextractable [^{14}C]residues increased from 0.7% at time 0 to 10.2-11.5% at 10 days and were 6.5-9.0% at 14 days.

[^{14}C]Iodomethane (as [^{14}C]methyltripropylamine) volatilized from the water-sediment systems increasing from 12.5-15.9% of the applied at 4 hours to 46.1-50.4% at 4 days and was 55.2-60.4% at 14 days (maximum 62.4% at 7 days). At 14 days (study termination), volatilized $^{14}CO_2$ and unidentified volatile [^{14}C]organics totaled 2.2-2.7% and 5.2-6.7% of the applied, respectively.

Half-lives of dissipation, based on first order linear regression analysis, of iodomethane from the total system, water layer and sediment were 40, 39 and 38 hours, respectively. **DT_{50} and DT_{90} values**, based on first order linear regression analysis, were 40-42 hours and 5.6-5.8 days, respectively.

Iodomethane dissipated from the anaerobic water-sediment systems via volatilization with minor formation of methanol, CO_2, unidentified volatile organics and sediment-bound residues.

Results Synopsis:

Test system: California water-sandy clay loam sediment.
Half-life values:
- entire system: 40.2 hours ($r^2 = 0.917$; 0- to 48-hour data).
- water layer: 38.8 hour ($r^2 = 0.924$; 0- to 48-hour data).
- sediment: 38.1 hours ($r^2 = 0.747$; 0- to 72-hour data).

DT_{50}:
- entire system: 40.1 hours ($r^2 = 0.9178$; 0- to 48-hour data).
- entire system: 41.8 hours ($r^2 = 0.8972$; 0- to 336-hour data).

DT_{90}:
- entire system: 5.6 days (0- to 48-hour data).
- entire system: 5.8 days (0- to 336-hour data).

Major transformation products:
- None.

Minor transformation products:
- Methanol.
- CO_2.
- Unidentified volatile organics.

Study Acceptability: This study is classified acceptable and satisfies the guideline requirement for an anaerobic aquatic metabolism study.

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: This study was conducted in accordance with USEPA Subdivision N Guideline §162-3 (p. 18). The following deviation from USEPA Subdivision N Guideline §162-3 was noted:

Material balances were incomplete with up to 22.9% of the applied radioactivity unaccounted for the last two sampling periods. These did not affect the validity of the study.

COMPLIANCE: This study was conducted in compliance with USEPA GLP Standards (40 CFR, Part 160; p. 3). Signed and dated Data Confidentiality, GLP (Compliance) and Quality Assurance statements and a Certificate of Authenticity were provided (pp. 2, 3, 6, 8).

A. MATERIALS:

1. Test Material: [^{14}C]Iodomethane (p. 19).

Chemical Structure: H_3C^*I.

Description: Technical, clear colorless liquid (p. 19; p. C 232 of Farm Chemicals Handbook 2002).

Purity: Radiochemical purity: >97% (Figure 1, p. 55).
Lot No.: 110K9407 (p. 19).
Analytical purity: Not repoted.
Specific activity: 6.1 mCi/mmol.

Storage conditions of test chemicals: Stored at <10°C (Appendix 1, p. 79).

Table 1: Physico-chemical properties of iodomethane (TM-425).

Parameter	Values	Comments
Molecular weight:	141.94 g/mol	
Molecular formula:	CH_3I	
Water solubility:	14.2 mg/mL at 25°C	
	1.4 g/100 mL at 20°C	International Chemical Safety Cards - Methyl Iodide at http://www.cdc.gov/niosh/ipcsneng/neng0509.html
	14 g/100 g at 20°C	p. C232 of Farm Chemicals Handbook 2002.
Vapor pressure/volatility (kPa):	50 at 20°C	International Chemical Safety Cards - Methyl Iodide
UV absorption:	Not reported.	
pK_a:	Not reported.	
K_{ow}/log K_{ow}:	Not reported.	
Henry's law K_H:	0.22	Estimated
Octanol/water partition coefficient (log P_{ow}):	1.51-1.69	International Chemical Safety Cards - Methyl Iodide
Boiling point:	42.4°C	
Melting point:	-66.5°C	International Chemical Safety Cards - Methyl Iodide
Relative density (water = 1):	2.3	International Chemical Safety Cards - Methyl Iodide
Relative vapor density (air = 1)	4.9	International Chemical Safety Cards - Methyl Iodide
Relative density of vapor/air mixture at 20°C (air = 1):	2.9	International Chemical Safety Cards - Methyl Iodide
Stability of compound at room temperature:	Not reported.	

Data obtained from pp. 19, 23 of the study report and where noted in the Comments column.

2. Water-sediment collection, storage and properties:

Table 2: Description of water-sediment collection and storage.

Description		Details
Geographic location:		Pond located at Plant Sciences, Inc., Litchfield Research Farm, Watsonville, California.
Pesticide use history at the collection site:		No pesticides had been applied to the collection site over the previous 5 years.
Collection date:		December 8, 2000.
Collection procedures:	water:	Not reported.
	sediment:	Not reported.
Sampling depth:	water:	Not reported.
	sediment:	Not reported.
Storage conditions:		Upon receipt at Ricera (12/13/00), water and sediment were stored separately under nitrogen atmosphere in an environmental chamber at 20°C.
Storage length:		Water and sediment received at test facility on 12/13/00 and experimental start date was 6/5/01 (day of application).
Preparation:	water:	None.
	sediment:	2-mm sieved wet.

Data obtained from p. 21, Table 2, p. 46, Appendix 1, p. 77 of the study report.

Table 3: Properties of the water.

Property		**Details**	
Temperature (°C):		Not reported.	
pH in water layer:		Initial (time 0):	Final (13 days):
	water layer:	7.18-7.22	8.14-8.17
	water-sediment interface:	7.18-7.22	7.88-8.01
Redox potential (mV) in water layer:		Initial (time 0):	Final (13 days):
	water layer:	-187.0 to -184.2	-275.3 to -270.9
	water-sediment interface:	-189.9 to -178.6	-224.1 to -213.5
Oxygen concentration (%):		Initial (time 0):	Final (13 days):
	water layer:	0.0	0.1-0.3
	water-sediment interface:	0.0	0.0 to 0.2
Dissolved organic carbon (mg/L):		6.93	
Total organic carbon (mg/L):		6.72	
Hardness (mg $CaCO_3$/L):		360	
Electrical conductivity:		Not reported.	
Biomass (mg microbial C/100 g, CFU or other):		Not reported.	

Data obtained from Table1, p. 45, Table 3, p. 47 of the study report.

Table 4: Properties of the sediment.

Property	Details
Textural classification:	Sandy clay loam.
% sand:	48.8
% silt:	25.6
% clay:	25.6
pH:	8.0
Organic carbon (%):	Not reported.
Organic matter (%):	2.08
CEC (meq/100 g):	16.87
Redox potential (mV):	Not reported.
Bulk density (g/cm^3):	Not reported.
Moisture content (%):	76.1
Biomass (x 10^6 bacterial and fungal CFU/g dry wt. sediment):	4.5 (pre-incubation)

Data obtained from pp. 21, Tables 1-2, pp. 45-46 of the study report.

B. EXPERIMENTAL CONDITIONS:

1. Preliminary experiments: A preliminary experiment to establish methodology and obtain information on the rate of degradation and formation of potential transformation products of iodomethane in an anaerobic water-sediment system was conducted, but not included in the study report (Appendix 1, pp. 80, 82, Appendix 2, p. 93).

2. Experimental conditions:

Table 5: Study design.

Criteria		Water-sandy clay loam sediment
Duration of the test:		336 hours (14 days).
Water: Filtered/unfiltered water: Type and size of filter used:		 Unfiltered. N/A.
Amount of sediment and water/treatment:	water:	150 g (*ca.* 112 mL added, 38 mL associated with sediment).
	sediment:	50 g dry wt. (*ca.* 88 g wet wt.).
Water/sediment ratio:		3:1 (g water:g sediment dry wt.).
Application rate:	nominal:	13 mg a.i./L water.
	actual:	13.1-13.2 mg/L.
Control conditions, if used (present differences from other treatments, i.e., sterile/non-sterile, experimental conditions):		Untreated water-sediment systems to be used for microbial evaluations were incubated under the same conditions as the treated systems.
No. of Replications:	Controls, if used:	Not reported.
	Treatments:	Triplicate systems at time 0 and duplicate systems at all other collection intervals.
Test apparatus (type/material/volume):		Sediment and water were transferred to narrow-necked 8-oz. glass bottles. Each bottle was sealed with a polytetrafluoroethylene (PTFE)-lined silicone septum cap, then the system was purged (flow rate not specified) with nitrogen for *ca.* 5 minutes via 20-gauge needles inserted in the cap. Each system was placed in a flow-through chamber within an environmental chamber and pre-incubated at 20 ± 1°C under nitrogen atmosphere for 22 days prior to treatment.
Details of traps for CO_2 and organic volatiles, if any:		Excluding the time 0 samples, humidified nitrogen was continuously drawn (5-7 mL/minute) through the headspace of each bottle via inlet/outlet 18-gauge 1 ½ Precision Glide Needles in the septum cap, then sequentially through single tubes of 2% tripropylamine (TPA) in dimethyl sulfoxide (DMSO), 1 N NaOH and coconut charcoal (10 g).
If no traps were used, is the system closed/open?		Volatiles traps were used.
Identity and concentration of co-solvent:		Water.

Criteria		Water-sandy clay loam sediment	
Test material application:	Vol. of test solution used/treatment:	0.56-0.61 mL of 3.22-3.51 mg/mL test solution (three separate test solutions were prepared).	
	Application method:	Applied to surface of the water layer.	
Any indication of the test material adsorbing to the walls of the test apparatus?		Not reported.	
Biomass (x 10^6 bacterial and fungal CFU/g dry wt. sediment)of control:		Initial (time 0):	Final (30 days):
		5.4	0.31
Biomass (x 10^6 bacterial and fungal CFU/g dry wt. sediment) of treated:		Initial (time 0):	Final (30 days):
		3.9	1.1
Experimental conditions:	Temperature (°C):	20 ± 1°C in an environmental chamber.	
	Continuous darkness:	Yes.	
Other details, if any:		None.	

Data obtained from pp. 16, 21, 22, 24-26, Table 2, p. 46, Table 4, p. 48, Figure 2, p. 56, Appendix 2, p. 79 of the study report.

3. Anaerobic conditions: The water-sediment systems were incubated under nitrogen atmosphere for 22 days prior to treatment. In duplicate systems at time 0 posttreatment, redox potentials in the water layer and at the water-sediment interface were -189.9 to -178.6 mV and dissolved oxygen concentrations were 0.0% (Table 3, p. 47). During incubation, humidified nitrogen was continuously drawn (5-7 mL/minute) through the headspace of the bottles containing the treated water-sediment systems.

4. Supplementary experiments: No supplementary experiments were conducted.

5. Sampling:

Table 6: Sampling details.

Criteria	Details
Sampling intervals:	0, 4, 8, 24, 48, 72, 96, 168, 240 and 336 hours.
Sampling method:	Triplicate samples at time 0 and duplicate samples were collected all remaining intervals.
Method of collection of CO_2 and volatile organic compounds:	Trapping solutions/materials were collected with respective soil samples.
Sampling intervals/times for: Sterility check, if sterile controls are used: Redox potential/other:	 Sterile controls were not used. Redox potential, dissolved O_2, and pH were measured at 0, 7 and 13 days posttreatment.
Sample storage before analysis:	All samples were reportedly analyzed within 17 days after sampling. Time 0 systems were centrifuged, extracted (heated nitrogen purge) and analyzed immediately posttreatment. All remaining treated systems were centrifuged and purged the day of collection. Nitrogen purge trapping solutions and the purged water layer were analyzed for total radioactivity, then subsamples (30-40 mL) were stored at <10°C in amber vials until HPLC analysis. Similarly, aliquots of the liquid trapping solutions from volatiles collection during incubation were analyzed for total radioactivity upon collection, then subsamples (30-40 mL) were stored at <10°C in amber vials until further analysis. Purged sediment and coconut charcoal tubes were homogenized, then stored frozen (<-10°C) until analysis.
Other observations, if any:	None.

Data obtained from pp. 22, 23, 25-28, 35 of the study report.

C. ANALYTICAL METHODS:

Separation of water and sediment: Upon collection, water and sediment were separated by centrifugation (5-10 minutes, rpm not specified), then the water layer was drawn off via vacuum in a closed system into a fritted impinger (p. 26, Figure 3, p. 57).

Extraction/clean up/concentration methods: The outside of the impinger tube containing the water layer was wrapped first with heating tape followed by a foil jacket for insulation (pp. 26, 27). The heating tape was set to 50°C and air was continuously drawn (flow rate not specified, *ca.* 45 minutes) through the water layer then sequentially through duplicate tubes containing 2% TPA in DMSO and a single tube of 1 N NaOH (Figure 3, p. 57). Following the purge, triplicate aliquots (1-2 mL x 3) of the trapping solutions and the purged water were analyzed for total radioactivity by LSC. Subsamples (30-40 mL) of all solutions were stored in amber vials at <10°C until further analysis; all 2% TPA in

DMSO trapping solutions containing ≥3% of the applied radioactivity and all purged water samples were analyzed by HPLC (p. 30). Purged water samples (5 mL) were filtered (0.22 µm) just prior to HPLC analysis (p. 31).

Upon removal of the water layer, the septum on the bottle containing the sediment was replaced and the entire sample refrigerated (<10°C, interval not specified, p. 27). For purging, the sample bottle was attached to an air-flow system as described above and placed in a sonic waterbath set at *ca.* 60°C (Figure 4, p. 58). Following the 45-minute purge, trapping solutions were analyzed and stored as described above.

Nonextractable residue determination: Purged sediment was air-dried for 2-3 days, homogenized by grinding to a powder with a mortar and pestle, then stored at <-10°C in high-density polyethylene (HDPE) bottles until analysis (p. 27). Triplicate subsamples (0.5 g x 3) were analyzed for total radioactivity by LSC following combustion (p. 28).

Extracted 10-day sediment samples were further extracted three times with acetone in a sonic waterbath at 40-45°C for 20 minutes per extraction (pp. 28, 29). Following each extraction, extract and sediment were separated by centrifugation, with the extract decanted and analyzed for total radioactivity by LSC. The acetone-extracted sediment was then extracted with 0.5N NaOH for 24 hours using a wrist-action shaker followed by two 0.5 N NaOH rinses and three water rinses (5 minutes with shaking per rinse). Sodium hydroxide and water extracts were combined and acidified to *ca.* pH 1 with HCl, then the resulting precipitate (humic acids) was removed by centrifugation. The supernatant (fulvic acids) was analyzed by LSC, and the precipitate was re-dissolved in 0.1 N NaOH and analyzed by LSC. [^{14}C]Residues remaining in the extracted sediment (humins) were quantified by LSC following combustion.

Volatile residue determination: Aliquots (1-2 mL x 3) of the trapping solutions were analyzed for total radioactivity using LSC (p. 28). All 2% TPA in DMSO solutions containing ≥3% of the applied radioactivity were analyzed by HPLC. All NaOH trapping solutions containing >0.25% of the total applied radioactivity were analyzed for $^{14}CO_2$ by barium chloride precipitation. Upon collection, the coconut charcoal tube was homogenized by grinding to a powder with a mortar and pestle, then stored at <-10°C in an amber bottle until analysis. Triplicate subsamples (0.1 g x 3) of the coconut charcoal were analyzed for total radioactivity by LSC following combustion.

Total ^{14}C measurement: Total ^{14}C residues were determined by summation of the concentrations of [^{14}C]residues measured in the nitrogen purge trapping solutions, purged water and sediment, and volatiles trapping materials (solutions and coconut charcoal; p. 29, Table 4, p. 48).

Derivatization method, if used: [^{14}C]Iodomethane de-methylated in the presence of the 2% TPA in DMSO trapping solution to yield [^{14}C]methyltripropylammonium ion (p. 39).
An aliquot (2 mL) of the 2% TPA in DMSO solution was vortexed with cold 0.05M 1-heptanesulfonic acid (1 mL) to ion pair the quaternary ammonium salt with 1-heptanesulfonic acid for HPLC analysis (pp. 31, 39).

Identification and quantification of parent compound: Nitrogen purge and volatile trapping 2% TPA in DMSO solutions were analyzed for parent [^{14}C]iodomethane (as [^{14}C]methyltripropylammonium ion) using reverse-phase HPLC (system 2) under the following conditions: Supelco Dicovery C18 column (4.6 x 150 mm, 5 µm particle size), injection volume 500 µL, gradient mobile phase combining (A) aqueous 0.005 M 1-heptanesulfonic acid and (B) acetonitrile [percent A:B at 0 min. 95:5 (v:v), 4 min. 95:5, 25 min. 50:50, 30 min. 50:50], flow rate 1.0 mL/minute, Radiomatic FLO-ONE\Beta radioactivity detector (pp. 30, 31). HPLC recoveries of selected samples averaged 94.1 ± 1.3% (n = 5) of the applied radioactivity (p. 33). Identification of parent [^{14}C]iodomethane in the solutions was based on cochromatography with derivatized labeled reference standard (p. 42, Figure 12, p. 66). Identification of [^{14}C]methyltripropylammonium ion was confirmed using LC/MS in electrospray ionization (ESI) mode (pp. 34, 35, 42, Figure 13, p. 67).

Identification and quantification of transformation products: Purged water samples were analyzed for transformation products of [^{14}C]iodomethane using cation-exchange HPLC (system 1) under the following conditions: Aminex HPX 87H column (7.8 x 300 mm), injection volume 1 mL, isocratic mobile phase 0.01 N sulfuric acid, flow rate 1.0 mL/minute, Beta Ram radioactivity detector (pp. 30, 31). HPLC recoveries of selected samples averaged 96.3 ± 0.7% (n = 5) of the applied radioactivity (p. 33). Identification of [^{14}C]methanol in the samples was based on cochromatography with labeled reference standard (p. 43, Figure 14, p. 68).

Detection limits (LOD, LOQ) for the parent compound and transformation products: The detection limit for LSC analyses was set at 3x average system background dpm equivalent to *ca.* 0.002% of the applied radioactivity; average system background radioactivity was *ca.* 47.3 dpm (p. 30). The detection limit for reverse-phase HPLC analyses (system 2) was established as 846 dpm (minimum peak height of 3x average background height) or a minimum of 0.05% of the applied radioactivity (p. 32, Appendix 6, p. 97). The detection limit for cation-exchange HPLC analyses (system 1) was established as 965 dpm (minimum peak height of 3x average background height) or a minimum of 0.07% of the applied radioactivity (p. 32, Appendix 5, p. 96).

II. RESULTS AND DISCUSSION:

A. TEST CONDITIONS: Anaerobic conditions, temperature, and other environmental conditions were maintained throughout the study. During the pre-incubation period (6 days prior to treatment) and following treatment (time 0 and at 7 and 13 days) in the water layer and at the water-sediment interface, redox potentials were -275.3 to -178.6 mV, dissolved oxygen concentrations were ≤0.3%, pH values were 7.16-8.17, and temperatures were 19.3-20.5°C (p. 37, Table 3, p. 47).

B. MATERIAL BALANCE: Overall recovery of radiolabeled material averaged 89.3 ± 7.6% (range 77.1-103.2%, n = 21) of the applied during the 336-hour study; material balances declined throughout the study (Table 4, p. 48).

Table 7: Volatilization of [^{14}C]iodomethane, expressed as percentage of applied radioactivity (mean ± s.d.[1], n = 3 for time 0 and n = 2 for all other intervals), in water-sandy clay loam sediment under anaerobic conditions.

Compound		Sampling times (hours)									
		0	4	8	24	48	72	96	168	240	336
Purged Iodomethane[2]	water[3]	87.4 ± 1.6	68.1 ± 1.3	65.3 ± 0.1	45.6 ± 0.5	35.8 ± 0.2	21.8 ± 1.8	16.6 ± 0.4	3.0 ± 2.2	2.6 ± 0.8	0.6 ± 0.5
	sediment[4]	9.2 ± 1.1	8.6 ± 0.6	4.8 ± 1.2	5.9 ± 0.2	4.7 ± 0.4	1.9 ± 0.4	1.6 ± 0.2	0.6 ± 0.5	0.4 ± 0.1	0.1 ± 0.0
Volatilized Iodomethane	entire system	NA[5]	14.2 ± 1.7	22.8 ± 0.9	30.9 ± 1.3	35.1 ± 1.5	48.5 ± 0.9	48.3 ± 2.1	58.8 ± 3.6	51.8 ± 1.0	57.8 ± 2.6
Methanol[6]	water	1.7-2.1	1.5-2.1	1.6-2.5	2.4-2.6	2.3-2.4	2.7-3.0	3.4-3.6	2.8-3.7	4.1-4.8	2.8-4.2
Unidentified radioactivity (Others)[7]	water	0.4-0.6	0.5	0.3-0.6	1.9-2.1	3.5-3.8	3.5-3.9	3.8-3.9	0.4-3.1	1.3-2.3	0.1-0.3
CO_2[8]	entire system	<0.1	0.1-0.2	0.2	0.4	0.6-0.7	0.8-0.9	0.8-0.9	1.1-2.0	1.4-2.0	2.2-2.7
Other volatiles[9]	entire system	0.0	<0.1	0.1-0.2	0.2-0.3	0.4-0.5	0.6-1.8	1.4-2.0	4.2-7.0	3.6-4.3	5.2-6.7
Nonextractable residues	sediment	0.7	1.5-1.7	1.8-2.0	4.3-5.7	7.1-8.2	7.9	8.8-9.4	7.4-9.5	10.2-11.5	6.5-9.0
Total % recovery	water[10]	89.7 ± 1.7	70.4 ± 1.6	67.9 ± 0.4	50.2 ± 0.5	42.1 ± 0.3	28.6 ± 1.9	24.1 ± 0.4	8.28 ± 4.0	9.25 ± 0.2	4.6 ± 1.3
	sediment[10]	9.9 ± 1.2	10.3 ± 0.7	6.7 ± 1.3	11.0 ± 0.9	12.5 ± 1.0	10.0 ± 0.4	10.8 ± 0.2	9.1 ± 1.5	11.5 ± 0.7	8.0 ± 1.4
	entire system	99.6 ± 2.7	94.9 ± 0.7	97.6 ± 1.8	92.4 ± 0.9	90.4 ± 0.1	88.6 ± 0.1	85.3 ± 1.7	82.8 ± 0.0	77.4 ± 0.3	78.3 ± 1.0

[1]Standard deviations determined by the reviewer (Attachment 1). Data obtained from Tables 6-10, pp. 50-54 of the study report.
[2]For 336-hour water samples and 72- to 336-hour sediment samples [^{14}C]iodomethane as total radioactivity (LSC) recovered in 2% TPA in DMSO solutions.
[3]Total iodomethane in water layer calculated by the reviewer as "Purged Water" + "2% TPA Traps from Purged Water"; data obtained from pp. 50, 51 of the study report.
[4]Means determined by the reviewer; data obtained from Table 9, p. 53 of the study report.
[5]Not analyzed.
[6]Detected only in water layer.
[7]Detected only in water layer. Summation of "Purged water" + "2% TPA Traps from Purged Water"; data obtained from Tables 6-7, pp. 50, 51 of the study report.
[8]Summation of $^{14}CO_2$ detected in water and sediment purges + volatiles NaOH trapping solutions; verified by barium chloride precipitation in selected samples.
[9]Summation of [^{14}C]residues detected in coconut charcoal trap and radioactivity remaining in solution following barium chloride precipitation of NaOH solutions.
[10]Means determined by the reviewer; data obtained from Table 4, p. 48 of the study report.

C. TRANSFORMATION OF PARENT COMPOUND: [^{14}C]Iodomethane in the total system decreased from 93.7-99.8% of the applied radioactivity at time 0 posttreatment to 50.9-51.8% at 24 hours, 22.2-25.1% at 72 hours, 0.9-6.1% at 168 hours and 0.1-1.1% at 336 hours (Table 10, p. 54). [^{14}C]Iodomethane was detected primarily in the water layer decreasing from 84.8-89.8% at time 0 to 45.0-46.0% at 24 hours, 19.9-23.6% at 72 hours, 0.8-5.1% at 168 hours and 0.1-1.0% at 336 hours (Table 7, p. 51). [^{14}C]Iodomethane in the sediment decreased from 7.6-10.3% at 0-4 hours to 3.6-6.0% at 8-48 hours, 1.4-2.3% at 72-96 hours and was ≤1.0% at 168-336 hours (Table 8, p. 52). Following application of [^{14}C]iodomethane to the surface of the water layer, [^{14}C]residues that did not volatilize partitioned into the sediment with average distribution ratios (water:sediment) of 7-11:1 at 0-8 hours, 5:1 at 24 hours, 2:1 at 96 hours, 1:1 at 168-240 hours and 1:2 at 336 hours (Attachment 1).

HALF-LIFE/DT$_{50}$: Half-lives of 40.2, 38.8 and 38.1 hours for the volatilization of [^{14}C]iodomethane from the total system, water layer and sediment, respectively, were determined by the reviewer using linear regression analysis based on first-order kinetics as calculated by Quattro Pro 8 software (Attachment 1). DT$_{50}$ and DT$_{90}$ values (50% and 90% dissipation times, respectively) were determined by the study author using linear regression analysis based on first-order kinetics as calculated by Microsoft Excel 97-SR2 software (pp. 41, 64).

Table 8: Half-life ($t_{1/2}$)/DT$_{50}$ values for the volatilization of iodomethane in aerobic sandy loam soil.

System	First order Linear[1]				
	Half-life (hours)	**Regression equation**	**r^2**	**DT$_{50}$[2]**	**DT$_{90}$**
water	0- to 48-hour data: 38.8	y = -0.01786x + 4.36	0.924	0- 48-hour data: 40.1 hours	0- to 48-hour data: 5.6 days
sediment	0- to 72-hour data: 38.1	y = -0.01821x + 2.12	0.747	0- to 336-hour data: 41.8 hours	0- 336-hour data: 5.8 days
entire system	0- to 48-hour data: 40.2	y = -0.01726x + 4.46	0.917		

[1]Data used for half-life calculations obtained from tables 6-8, pp. 50-52, table 10, p. 54 of the study report.
[2]Calculated by study author; linear regression equations for 0- to 48-hour and 0- to 336-hour results were y = - 0.0173x + 4.4604 (r^2 = 0.9178) and y = -0.0166x + 4.4125 (r^2 = 0.8972), respectively (Figure 10, p. 64 of the study report). DT$_{50}$ and DT$_{90}$ values obtained from p. 41 of the study report.

TRANSFORMATION PRODUCTS: No major transformation products of [^{14}C]iodomethane were detected in the water layers or sediment extracts. One minor transformation product, methanol, was detected in the water layers at a maximum 4.8% of the applied at 240 hours posttreatment and was 2.8-4.2% at 336 hours (Table 6, p. 50). Minor products detected following the heated purge of the water layer were $^{14}CO_2$ and other unidentified volatile [^{14}C]organics each detected at ≤0.61% of the applied radioactivity (Table 5, p. 49). Residues in NaOH solutions following the heated purge of the

sediment were not differentiated into $^{14}CO_2$ and other volatile [^{14}C]organics because total radioactivity recovered was ≤0.2% of the applied (Table 4, p. 48).

NONEXTRACTABLE AND EXTRACTABLE RESIDUES: Extractable (heated purge) [^{14}C]residues in the sediment decreased from 7.6-10.3% of the applied radioactivity at 0-4 hours to 3.6-6.0% at 8-48 hours, 0.1-2.3% at72-240 hours and were ≤0.1% at 336 hours, while nonextractable [^{14}C]residues increased from 0.7% at time 0 to 10.2-11.5% at 240 hours and were 6.5-9.0% at 336 hours (Table 4, p. 48).

VOLATILIZATION: [^{14}C]Iodomethane volatilized from the water-sediment systems increasing from 12.5-15.9% of the applied at 4 hours posttreatment to 29.6-32.2% at 24 hours, 46.1-50.4% at 96 hours and was 55.2-60.4% at 336 hours (maximum 62.4% at 168 hours, Table 10, p. 54). At 336 hours (study termination), volatilized $^{14}CO_2$ totaled 2.2-2.7% of the applied and other unidentified [^{14}C]organic volatiles totaled 5.2-6.7%.

TRANSFORMATION PATHWAY: The study author proposed a transformation pathway (p. 63); however, iodomethane primarily dissipated from the water-sediment systems via volatilization rather than metabolic transformation.

Table 9: Chemical names for transformation products of iodomethane in anaerobic water-sandy clay loam sediment.[1]

Applicant's Code	CAS Number	Chemical Name	Chemical formula	Molecular weight (g/mol)	SMILES string
None	67-56-1	Methanol	CH_3OH	32.04	CO

[1]Data obtained from Merck Index, Thirteenth Edition, p. 1065, monograph #5984.

D. SUPPLEMENTARY EXPERIMENT-RESULTS: No supplementary experiments were conducted.

III. STUDY DEFICIENCIES: This study fulfilled the anaerobic aquatic biotransformation guideline, USEPA Subdivision N Guideline §162-3, for iodomethane, however, material balances were incomplete with up to 22.9% of the applied radioactivity unaccounted in the last two sampling events. The study author proposed that the missing radioactivity was due to losses of volatilized [^{14}C]iodomethane purged through the 2% TPA in DMSO trapping solution during incubation (p. 38).

IV. REVIEWER'S COMMENTS:

1. Analysis of iodomethane in the 2% TPA in DMSO solutions was non-specific; however, comparative HPLC co-chromatography and MS analyses of derivatized reference standard [^{14}C]iodomethane and suspected derivatized [^{14}C]iodomethane recovered in 2% TPA in DMSO

solutions from the treated samples indicates that only iodomethane was volatilized from the water-sediment systems (p. 42, Figures 12-13, pp. 66-67).

2. The minor biotransformation product detected in the water layer was only tentatively identified as methanol by HPLC co-chromatography with reference standard [^{14}C]methanol (p. 43, Figure 14, p. 68); however, [^{14}C]methanol in the water layers was only detected at ≤4.8% of the applied radioactivity during the study.

3. The study author reported differentiation of radioactivity recovered in NaOH trapping solutions as $^{14}CO_2$ and other volatiles [^{14}C]organics at all sampling intervals for volatiles trapping solutions recovered during incubation and trapping solutions recovered after heated purges of water layers and sediment; however, only selected samples were analyzed by barium chloride precipitation to determine differentiation (Table 5, p. 49). For the 4- to 12-hour volatiles trapping NaOH solutions, 0- to 8-hour purged water NaOH trapping solutions and all of the purged sediment NaOH trapping solutions, differentiation between $^{14}CO_2$ and other volatile [^{14}C]organics was determined by mathematical calculation (pp. 38, 39).

4. The application rate of 13 mg a.i./L water was reported to approximate the single maximum field use rate of 263 kg a.i./ha assuming a water depth of 200 cm (pp. 16, 18).

V. REFERENCES: No references were cited in the study.

Attachment 1

Quattro Pro Graphs and Spreadsheets

Anaerobic Aquatic Metabolism of [^{14}C]Iodomethane in Water-Sandy Clay Loam Sediment.
MRID 45593708

Volatilization of [^{14}C]iodomethane from total system.
Half-life Determination

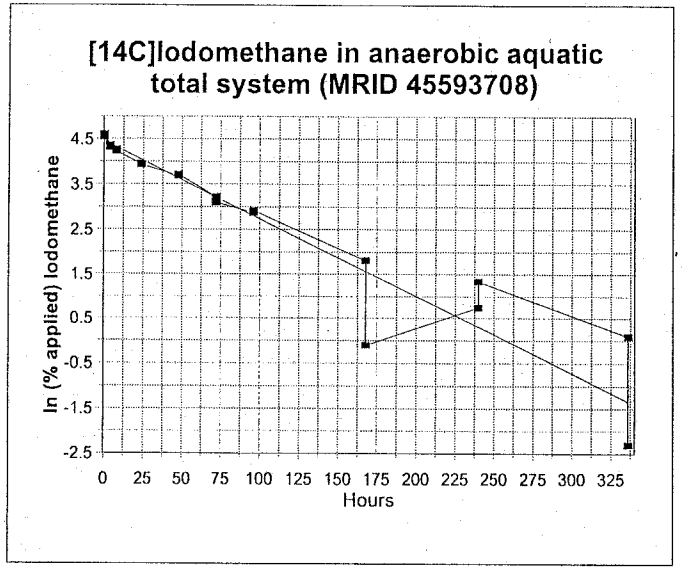
Iodomethane		
Hour	%AR	Ln(%AR)
0	93.7	4.540098
0	99.8	4.603168
0	96.1	4.565389
4	78.5	4.363099
4	74.6	4.312141
8	71.4	4.268298
8	68.7	4.229749
24	51.8	3.94739
24	50.9	3.929863
48	40.0	3.688879
48	41.1	3.716008
72	25.1	3.222868
72	22.2	3.100092
96	17.6	2.867899
96	18.6	2.923162
168	6.1	1.808289
168	0.9	-0.10536
240	2.1	0.741937
240	3.8	1.335001
336	1.1	0.09531
336	0.1	-2.30259

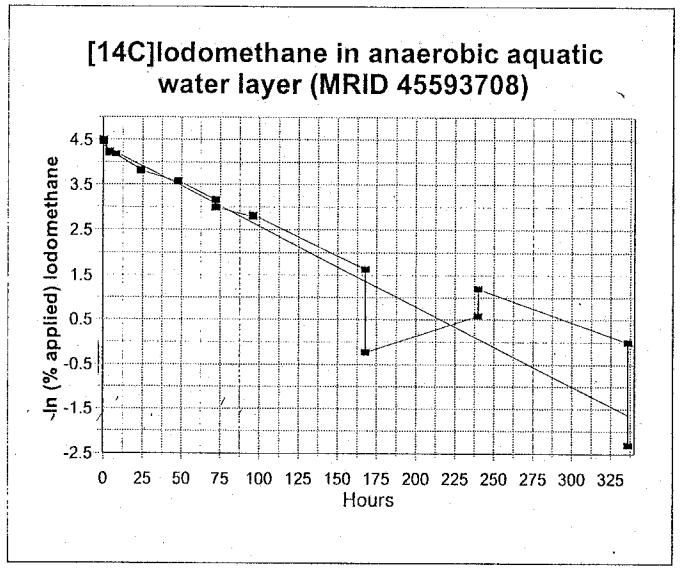
0- to 48-hour data

Regression Output:

Constant	4.46
Std Err of Y Est	0.1
R Squared	0.917
No. of Observations	11
Degrees of Freedom	9
X Coefficient(s)	-0.01726
Std Err of Coef.	0.001726

half-life 40.2 hours





Volatilization of [^{14}C]iodomethane from water layer.
Half-life Determination

Iodomethane		
Hour	%AR	Ln(%AR)
0	86.1	4.455509
0	89.6	4.495355
0	86.5	4.460144
4	69.4	4.239887
4	66.7	4.200205
8	65.4	4.180522
8	65.1	4.175925
24	46.1	3.830813
24	45.0	3.806662
48	35.6	3.572346
48	36.0	3.583519
72	23.6	3.161247
72	19.9	2.99072
96	16.2	2.785011
96	16.9	2.827314
168	5.1	1.629241
168	0.8	-0.22314
240	1.8	0.587787
240	3.3	1.193922
336	1.0	0
336	0.1	-2.30259

0- to 48-hour data

Regression Output:

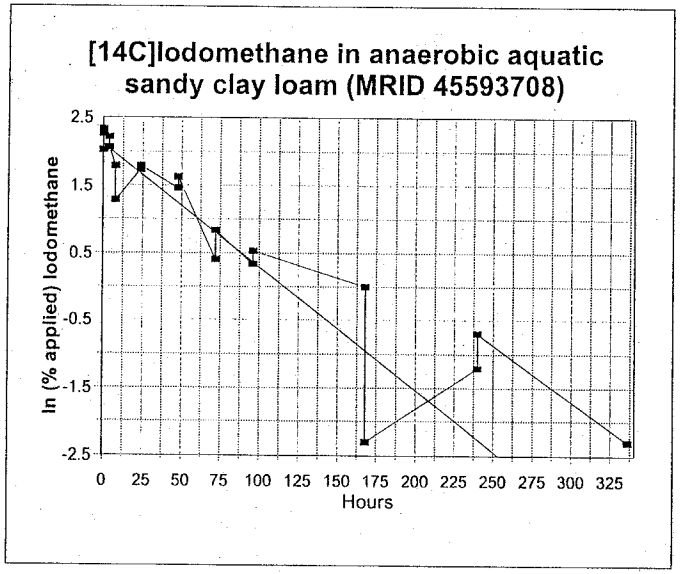
Constant	4.36
Std Err of Y Est	0.099
R Squared	0.924
No. of Observations	11
Degrees of Freedom	9
X Coefficient(s)	-0.01786
Std Err of Coef.	0.001703

half-life 38.8 hours

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results for total system from p. 54 of study report and for water layer from pp. 50, 51 of study report and Attachment 1.

Anaerobic Aquatic Metabolism of [^{14}C]Iodomethane in Water-Sandy Clay Loam Sediment.
MRID 45593708
Volatilization of [^{14}C]iodomethane from sediment.
Half-life Determination

Iodomethane		
Hour	%AR	Ln(%AR)
0	7.6	2.028148
0	10.3	2.332144
0	9.6	2.261763
4	9.2	2.219203
4	7.9	2.066863
8	6.0	1.791759
8	3.6	1.280934
24	5.7	1.740466
24	6.0	1.791759
48	4.3	1.458615
48	5.1	1.629241
72	1.5	0.405465
72	2.3	0.832909
96	1.4	0.336472
96	1.7	0.530628
168	1.0	0
168	0.1	-2.30259
240	0.3	-1.20397
240	0.5	-0.69315
336	0.1	-2.30259
336	0.0	ERR



0- to 72-hour data

Regression Output:

Constant	2.12
Std Err of Y Est	0.3
R Squared	0.747
No. of Observations	13
Degrees of Freedom	11

X Coefficient(s) -0.01821
Std Err of Coef. 0.003195

half-life 38.1 hours

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from p. 52 of study report.

Anaerobic Aquatic Metabolism of [^{14}C]Iodomethane in Water-Sandy Clay Loam Sediment/MRID 45593708

Determination of means/standard deviations for applied radioactivity in trapping materials and unextractable sediment [^{14}C]residues.

	Water layer												Sediment											
	Water Purge												Sediment Purge											
	2% TPA in DMSO			NaOH			Unextractable			Total Water			2% TPA in DMSO			NaOH			Unextractable			Total Sediment		
Hours	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	85.8			0.0			2.5			88.3			7.6			0.0			0.7			8.3		
0	89.6			0.0			2.5			92.1			10.3			0.0			0.7			11.0		
0	84.8	86.7	2.1	0.0	0.0	0.0	4.0	3.0	0.7	88.8	89.7	1.7	9.6	9.2	1.1	0.1	0.0	0.0	0.7	0.7	0.0	10.4	9.9	1.2
4	69.3			0.1			2.6			72.0			9.2			0.1			1.7			11.0		
4	66.0	67.7	1.6	0.0	0.1	0.1	2.7	2.7	0.0	68.7	70.4	1.6	7.9	8.6	0.6	0.1	0.1	0.0	1.5	1.6	0.1	9.5	10.3	0.7
8	64.9			0.1			2.4			67.4			6.0			0.0			2.0			8.0		
8	65.1	65.0	0.1	0.1	0.1	0.0	3.1	2.8	0.4	68.3	67.9	0.4	3.6	4.8	1.2	0.0	0.0	0.0	1.8	1.9	0.1	5.4	6.7	1.3
24	47.2			0.2			3.3			50.7			5.7			0.1			4.3			10.1		
24	46.4	46.8	0.4	0.1	0.2	0.0	3.1	3.2	0.1	49.6	50.2	0.5	6.0	5.9	0.2	0.1	0.1	0.0	5.7	5.0	0.7	11.8	11.0	0.9
48	38.0			0.3			3.5			41.8			4.3			0.1			7.1			11.5		
48	39.1	38.6	0.6	0.3	0.3	0.0	3.0	3.3	0.3	42.4	42.1	0.3	5.1	4.7	0.4	0.1	0.1	0.0	8.2	7.7	0.6	13.4	12.5	1.0
72	26.6			0.4			3.5			30.5			1.5			0.2			7.9			9.6		
72	22.3	24.5	2.1	0.3	0.4	0.1	4.0	3.8	0.3	26.6	28.6	1.9	2.3	1.9	0.4	0.2	0.2	0.0	7.9	7.9	0.0	10.4	10.0	0.4
96	19.4			0.3			4.0			23.7			1.4			0.1			9.4			10.9		
96	19.8	19.6	0.2	0.3	0.3	0.0	4.4	4.2	0.2	24.5	24.1	0.4	1.7	1.6	0.2	0.1	0.1	0.0	8.8	9.1	0.3	10.6	10.8	0.2
168	7.6			0.3			4.3			12.2			1.0			0.1			9.5			10.6		
168	0.9	4.3	3.4	0.2	0.3	0.1	3.1	3.7	0.6	4.2	8.2	4.0	0.1	0.6	0.5	0.1	0.1	0.0	7.4	8.5	1.1	7.6	9.1	1.5
240	3.8			0.6			5.0			9.4			0.3			0.2			10.2			10.7		
240	3.9	3.9	0.1	0.4	0.5	0.1	4.7	4.9	0.2	9.0	9.2	0.2	0.5	0.4	0.1	0.2	0.2	0.0	11.5	10.9	0.6	12.2	11.5	0.7
336	1.0			0.4			4.5			5.9			0.1			0.2			9.0			9.3		
336	0.1	0.6	0.5	0.2	0.3	0.1	2.9	3.7	0.8	3.2	4.6	1.3	0.0	0.1	0.1	0.1	0.2	0.0	6.5	7.8	1.3	6.6	8.0	1.4

Table continued on next page.

Anaerobic Aquatic Metabolism of [^{14}C]Iodomethane in Water-Sandy Clay Loam Sediment/MRID 45593708
Determination of means/standard deviations for applied radioactivity in trapping materials and unextractable sediment [^{14}C]residues (continued).

	Volatiles											
	2% TPA in DMSO			NaOH			Charcoal			Material Balances[1]		
Hours	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	NA			NA			NA			96.6		
0	NA			NA			NA			103.1		
0	NA			NA			NA			99.2	99.6	2.7
4	12.5			0.0			0.0			95.5		
4	15.9	14.2	1.7	0.1	0.1	0.1	0.0	0.0	0.0	94.2	94.9	0.7
8	23.8			0.1			0.1			99.4		
8	21.9	22.9	0.9	0.1	0.1	0.0	0.0	0.1	0.1	95.7	97.5	1.8
24	32.2			0.2			0.1			93.3		
24	29.6	30.9	1.3	0.3	0.3	0.1	0.3	0.2	0.1	91.6	92.5	0.9
48	36.6			0.4			0.2			90.5		
48	33.6	35.1	1.5	0.4	0.4	0.0	0.5	0.4	0.2	90.3	90.4	0.1
72	47.5			0.4			0.4			88.4		
72	50.2	48.9	1.3	0.7	0.6	0.1	0.8	0.6	0.2	88.7	88.6	0.1
96	51.0			0.6			0.7			86.9		
96	46.9	49.0	2.0	0.7	0.7	0.1	0.9	0.8	0.1	83.6	85.3	1.7
168	57.7			1.0			1.4			82.9		
168	65.3	61.5	3.8	3.3	2.2	1.2	2.5	2.0	0.6	82.9	82.9	0.0
240	54.5			1.4			1.7			77.7		
240	52.7	53.6	0.9	1.4	1.4	0.0	1.8	1.8	0.0	77.1	77.4	0.3
336	56.4			2.9			2.8			77.3		
336	62.2	59.3	2.9	4.3	3.6	0.7	3.0	2.9	0.1	79.3	78.3	1.0
									Overall		89.2	7.6

[1]Material balance = sum of water and sediment purge, unextractable [14C] and volatiles.
Results (% AR) from p. 48 of the study report.
Means calculated using Corel Quattro Pro 8 program equation @avg(A1..A2).
Standard deviations calculated using Corel Quattro Pro 8 program equation @std(A1..A2).

Anaerobic Aquatic Metabolism of [^{14}C]Iodomethane in Water-Sandy Clay Loam Sediment/MRID 45593708

Determination of means/standard deviations for [^{14}C]iodomethane.

	Iodomethane																	
	Water layer									Sediment[2]						Volatilized		
	Purged			Remaining[1]														
Hours	% AR	Mean	s.d.	% AR	Mean	s.d.	Total water			% AR	Mean	s.d.	Total system			% AR	Mean	s.d.
0	85.8			0.3			86.1			7.6			93.7			NA		
0	89.6			0.035			89.6			10.3			99.8			NA		
0	84.8	86.7	2.1	1.7	0.7	0.7	86.5	87.4	1.6	9.6	9.2	1.1	96.1	96.5	2.5	NA	0.0	0.0
4	69.3			0.1			69.4			9.2			78.5			12.5		
4	66.0	67.7	1.6	0.7	0.4	0.3	66.7	68.1	1.3	7.9	8.6	0.6	74.6	76.6	1.9	15.9	14.2	1.7
8	64.9			0.5			65.4			6.0			71.4			23.8		
8	65.1	65.0	0.1	0.035	0.3	0.2	65.1	65.3	0.1	3.6	4.8	1.2	68.7	70.1	1.3	21.9	22.9	0.9
24	46.0			0.1			46.1			5.7			51.8			32.2		
24	45.0	45.5	0.5	0.04	0.1	0.0	45.0	45.6	0.5	6.0	5.9	0.2	50.9	51.4	0.4	29.6	30.9	1.3
48	35.5			0.1			35.6			4.3			40.0			36.6		
48	36.0	35.8	0.3	0.035	0.1	0.0	36.0	35.8	0.2	5.1	4.7	0.4	41.1	40.6	0.6	33.6	35.1	1.5
72	23.6			0.0			23.6			1.5			25.1			47.5		
72	19.9	21.8	1.8	0.0	0.0	0.0	19.9	21.8	1.8	2.3	1.9	0.4	22.2	23.7	1.5	49.4	48.5	0.9
96	16.2			0.0			16.2			1.4			17.6			50.4		
96	16.9	16.6	0.4	0.0	0.0	0.0	16.9	16.6	0.4	1.7	1.6	0.2	18.6	18.1	0.5	46.1	48.3	2.1
168	5.1			0.0			5.1			1.0			6.1			55.1		
168	0.8	3.0	2.2	0.0	0.0	0.0	0.8	3.0	2.2	0.1	0.6	0.5	0.9	3.5	2.6	62.4	58.8	3.6
240	1.8			0.0			1.8			0.3			2.1			52.8		
240	3.3	2.6	0.8	0.0	0.0	0.0	3.3	2.6	0.8	0.5	0.4	0.1	3.8	3.0	0.8	50.7	51.8	1.0
336	1.0			0.0			1.0			0.1			1.1			55.2		
336	0.1	0.6	0.5	0.0	0.0	0.0	0.1	0.6	0.5	0.025	0.1	0.0	0.1	0.6	0.5	60.4	57.8	2.6

[1]Detection limit 0.07% of the applied radioactivity (p. 32 of the study report)

[2]Detection limit 0.05% of the applied radioactivity (p. 32 of the study report)

Results (% AR) from pp. 50-54 of the study report.

Means calculated using Corel Quattro Pro 8 program equation @avg(A1..A2).

Standard deviations calculated using Corel Quattro Pro 8 program equation @std(A1..A2).

Anaerobic Aquatic Metabolism of [^{14}C]Iodomethane in Water-Sandy Clay Loam Sediment/MRID 45593708

[14C]Residue water phase:sediment ratios for sandy clay loam sediment-water systems.

Day	Water[1] (%AR)	Sediment[2] (%AR)	Ratio W:S	Ratio S:W	Mean W:S ratio	s.d.	Mean S:W ratio	s.d.
0	88.3	8.3	11	0				
0	92.1	11.0	8	0				
0	88.8	10.4	9	0	9	1	0	0
4	72.0	11.0	7	0				
4	68.7	9.5	7	0	7	0	0	0
8	67.4	8.0	8	0				
8	68.3	5.4	13	0	11	2	0	0
24	50.7	10.1	5	0				
24	49.6	11.8	4	0	5	0	0	0
48	41.8	11.5	4	0				
48	42.4	13.4	3	0	3	0	0	0
72	30.5	9.6	3	0				
72	26.6	10.4	3	0	3	0	0	0
96	23.7	10.9	2	0				
96	24.5	10.6	2	0	2	0	0	0
168	12.2	10.6	1	1				
168	4.2	7.6	1	2	1	0	1	0
240	9.4	10.7	1	1				
240	9.0	12.2	1	1	1	0	1	0
336	5.9	9.3	1	2				
336	3.2	6.6	0	2	1	0	2	0

0- to 8-hour results

Mean W:S ratio	s.d.	Mean S:W ratio	s.d.
9	2	0	0

[1]Water = summation of "Water" + "3% TPA" + "1N NaOH".

[2]Sediment = summation of "2% TPA" + "1N NaOH" + "Residues".

Results (% AR) from p. 48 of the study report.

Attachment 2

Transformation Pathway Presented by Registrant
Illustration of Test System
Illustration of the Analytical System

Figure 9: Proposed Environmental Fate Pathway for Iodomethane in the Anaerobic Aquatic Metabolism Study

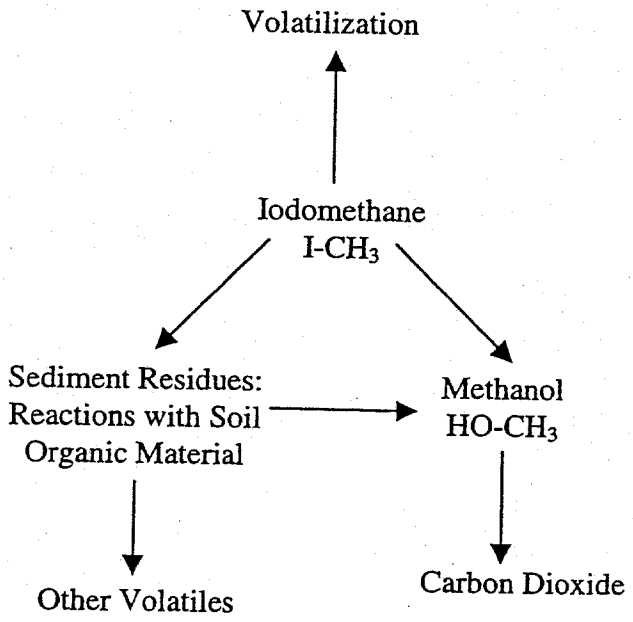


Figure 2: Volatile Sampling Assembly

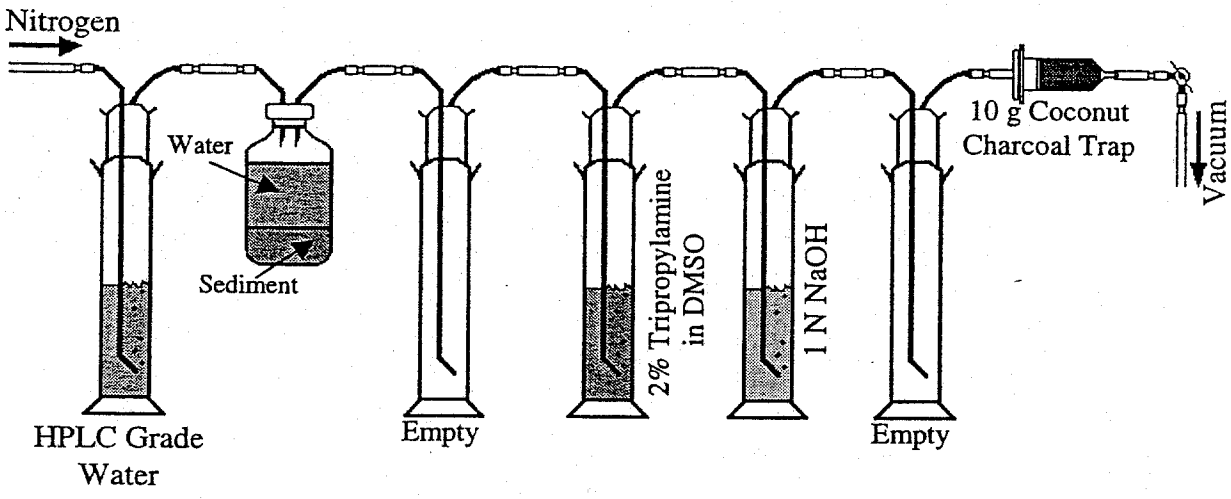
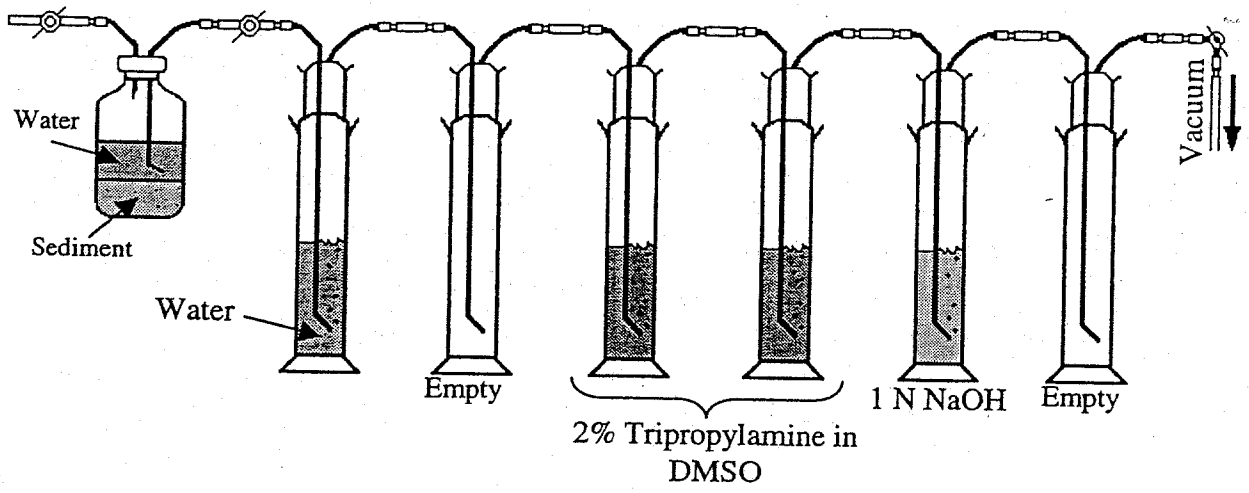


Figure 3: Water Extraction Procedure

Transfer of Water to the First Empty Impinger:



Heated "Purge" of Water and Collection of Volatiles:

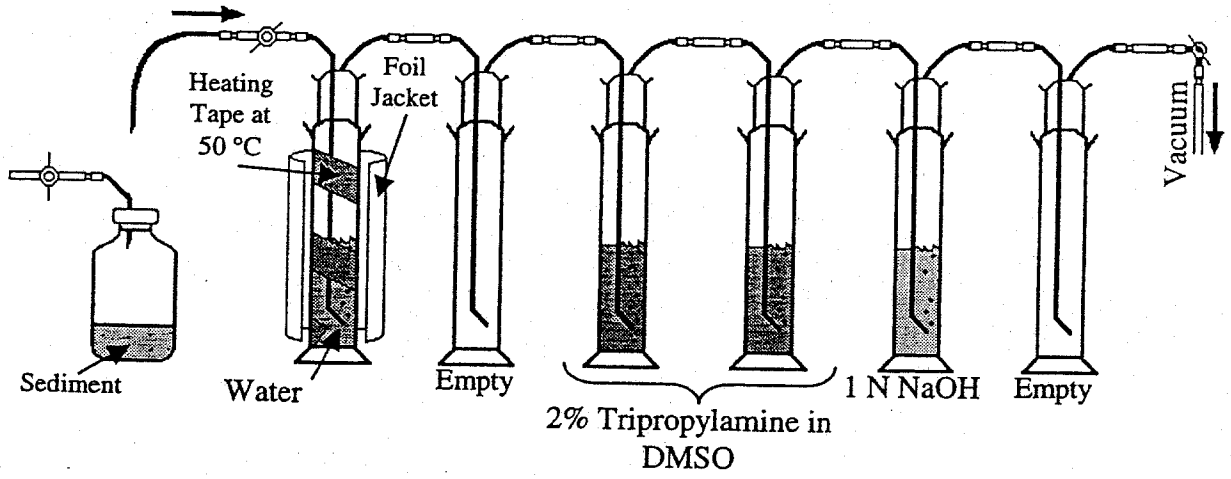


Figure 4: Sediment Extraction Procedure