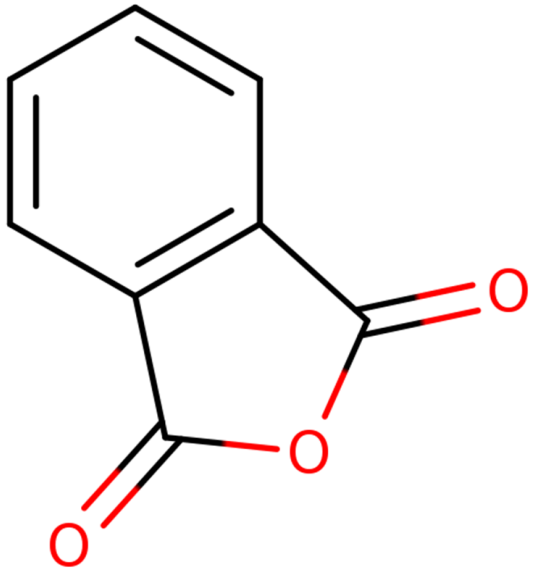
United States
Environmental Protection Agency

March 2026
Office of Chemical Safety and
Pollution Prevention

Data Quality Evaluation and Data Extraction Information for Environmental Fate and Transport for Phthalic Anhydride

Systematic Review Support Document for the Draft Risk Evaluation

CASRN: 85-44-9



March 2026

This supplemental file contains information regarding the data extraction and evaluation results for data sources that were considered for the *Draft Risk Evaluation for Phthalic Anhydride* and that underwent systematic review. EPA used the TSCA systematic review process described in the *Draft Systematic Review Protocol Supporting TSCA Risk Evaluations for Chemical Substances* (also referred to as the '2021 Draft Systematic Review Protocol'). The systematic review steps are further described in the *Draft Systematic Review Protocol for Phthalic Anhydride*. EPA conducted data extractions and data quality evaluations based on author-reported descriptions and results; additional analyses (*e.g.*, statistical analyses) potentially conducted by EPA are not contained in this supplemental file. Additionally, the overall quality determination (OQD) for each reference represents the data as a whole for each study and not for individual metric domains within a study.

Table of Contents

Phthalic acid

Study Citation:	Andres, G. O., Granados, A. M., De Rossi, R. H. (2001). Kinetic study of the hydrolysis of phthalic anhydride and aryl hydrogen phthalates. Journal of Organic Chemistry 66(23):7653-7657.
OECD Harmonized Template:	Hydrolysis
HERO ID:	5178311

EXTRACTION

Parameter	**Data**
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, Type, Guideline	None; Experimental; other: Hydrolysis study in the presence of bases, guideline not specified
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Anedra; NR; NR Notes: Sublimated before use
Buffer, Test Temperature, Number of Replicates	N-methyl imidazole; H2PO4-/HPO42-; 25°C; Not reported
Positive Controls and Negative Controls	Positive: Not reported; Negative: Not reported
pH and Duration	6.20 - 7.8; Not reported
Sampling Frequency and Test Setup	Not reported; Hydrolysis in purified water with small amount of dry acetonitrile (0.1 mL; total ACN concentration = 3.85%) using a stopped-flow technique in an Applied Photophysics SF 17MV apparatus with unequalmixing.
Concentration	5E-4 mol/L
Analytical Method, Analytical Details, and Statistics	Spectrophotometer; Observed rate constants determined by measuring the change in absorbance at 300 nm; kinetic traces were fit with one-, two-, or three-exponential equationsusing software of Applied Photophysics SF apparatus; Not reported
Transformation Products	phthalic acid
Reference Substance and Reference Substance Results	Not reported; Not reported
Percent Recovery, Hydrolysis Rate Constant, and Half-life	Not reported; 0.277/M s (second order rate constant at pH 7.8); Not reported
Results Remarks	Rate constant: k1=0.277 M-1 extperiodcentered s-1 with N-methyl imidazole buffer (pKa 7.20)and 1.67× 10-4 M-1 extperiodcentered s-1 with H2O (pKa -1.74)k1=1.1 M-1 extperiodcentered s-1 with (HPO4)2-, (pKa 6.28)Half-life (calculated in ECHA):70 sec at pHs 0-6;61 sec at pH-value of 6.8, with N-methyl imidazole;30.5 sec at pH 7.24, with phosphate2.4 sec at pH 8.9, with CO3/HCO3-

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were not reported; however, the test substance was sublimated prior to use.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Controls were not explicitly reported.
	Metric 4:	Test Substance Stability	Medium	Test substance storage and preparation were not explicitly reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	Test method details were reported.
	Metric 6:	Testing Conditions	Medium	Test conditions were reported; the test duration was omitted.

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Study Citation:	Andres, G. O., Granados, A. M., De Rossi, R. H. (2001). Kinetic study of the hydrolysis of phthalic anhydride and aryl hydrogen phthalates. Journal of Organic Chemistry 66(23):7653-7657.
OECD Harmonized Template:	Hydrolysis
HERO ID:	5178311

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed the outcomes of interest.
	Metric 12:	Test Substance Purity	High	Sampling frequency allowed calculation of rate constants but minimal sampling details provided.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Statistical techniques were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	Data reporting was appropriate for the study; additional detail provided in SI document.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were adequately described and appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Bunton, C. A., Fuller, N. A., Perry, S. G., Shiner, V. J. (1963). The hydrolysis of carboxylic anhydrides. Part III. Reactions in initially neutral solution. Journal of the American Chemical Society (0):2918-2926.
OECD Harmonized Template:	Hydrolysis
HERO ID:	28923

EXTRACTION

Parameter	**Data**
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, Type, Guideline	None; Experimental; other
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Buffer, Test Temperature, Number of Replicates	Not Reported; 25.1°C; Not reported
Positive Controls and Negative Controls	Positive: Not reported; Negative: Not reported
pH and Duration	initially neutral; Not reported
Sampling Frequency and Test Setup	Not reported; Not Reported
Concentration	Not reported
Analytical Method, Analytical Details, and Statistics	titration; Not reported; Not reported
Transformation Products	Not reported
Reference Substance and Reference Substance Results	Not reported; Not reported
Percent Recovery, Hydrolysis Rate Constant, and Half-life	Not reported; First-order hydrolysis rate constant: 0.000429/sec; Not reported
Results Remarks	Half-life: 24.8 minutes calculated in HERO ID 6592047

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	Medium	The source and purity of the test substance was not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Controls were not explicitly reported.
	Metric 4:	Test Substance Stability	Medium	Test substance storage and preparation were not explicitly reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	Limited test method details provided, may have been reported in supplemental information.
	Metric 6:	Testing Conditions	Medium	Limited test conditions reported, may have been reported in supplemental information.
	Metric 7:	Testing Consistency	Medium	Test conditions were not reported, it is assumed that they were consistent across study groups.

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Study Citation:	Bunton, C. A., Fuller, N. A., Perry, S. G., Shiner, V. J. (1963). The hydrolysis of carboxylic anhydrides. Part III. Reactions in initially neutral solution. Journal of the American Chemical Society (0):2918-2926.
OECD Harmonized Template:	Hydrolysis
HERO ID:	28923

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed the outcomes of interest.
	Metric 12:	Test Substance Purity	High	Sampling frequency allowed calculation of rate constants but minimal sampling details provided.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability and uncertainty were not explicitly addressed.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Very limited study details were reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were adequately described and appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Gandour, R. D., Coyne, M., Stella, V. J., Schowen, R. L. (1980). Proton inventory of phthalic-anhydride hydrolysis - comments on analysis of proton-inventory data. Journal of Organic Chemistry 45(10):1733-1737.
OECD Harmonized Template:	Hydrolysis
HERO ID:	5180207

EXTRACTION

Parameter	**Data**
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, Type, Guideline	None; Experimental; other: Hydrolysis study in the presence of buffer
Solvent, Reactivity, Storage, Stability	dioxane; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: Recrystallized from benzene
Buffer, Test Temperature, Number of Replicates	Acetate buffer 1:9 [HOAc] : [-OAc]; 25°C; Not reported
Positive Controls and Negative Controls	Positive: Not reported; Negative: Not reported
pH and Duration	Not reported; Not reported
Sampling Frequency and Test Setup	Not reported; Acetate concentration varied from 0.02 to 0.1 M, ionic strength maintained at 0.1. test conducted in 1 cm cuvette
Concentration	3.3E-4 M
Analytical Method, Analytical Details, and Statistics	Reported elsewhere; Reported elsewhere; ±4 10^6/s
Transformation Products	Not reported
Reference Substance and Reference Substance Results	Not reported; Not reported
Percent Recovery, Hydrolysis Rate Constant, and Half-life	Not reported; 1051 10^6/s; Not reported
Results Remarks	k_obs=k_s + k_OAc[-OAc]

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	Medium	The source and purity of the test substance was not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Controls were not explicitly reported.
	Metric 4:	Test Substance Stability	Medium	Test substance storage and preparation were not explicitly reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	Limited test method details provided, may have been reported in supplemental information.
	Metric 6:	Testing Conditions	Low	Limited test conditions reported, such as pH, but may have been reported in supplemental information.
	Metric 7:	Testing Consistency	Medium	Test conditions were not reported, it is assumed that they were consistent across study groups.

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Study Citation:	Gandour, R. D., Coyne, M., Stella, V. J., Schowen, R. L. (1980). Proton inventory of phthalic-anhydride hydrolysis - comments on analysis of proton-inventory data. Journal of Organic Chemistry 45(10):1733-1737.
OECD Harmonized Template:	Hydrolysis
HERO ID:	5180207

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed the outcomes of interest.
	Metric 12:	Test Substance Purity	High	Sampling frequency allowed calculation of rate constants but minimal sampling details provided.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability and uncertainty were considered in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Very limited study details were reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were adequately described and appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — Medium

Study Citation:	Hawkins, M. D. (1975). Hydrolysis of phthalic acid and 3,6-dimethylphthalic anhydrides. Journal of the Chemical Society, Perkin Transactions 2: Physical Organic Chemistry 1(4):282-284.
OECD Harmonized Template:	Hydrolysis
HERO ID:	7346841

EXTRACTION

Parameter	**Data**
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, Type, Guideline	None; Experimental; other
Solvent, Reactivity, Storage, Stability	NR; NR; vacuum desiccator; NR
Radiolabel, Source, State, Purity	NR; B.D.H.; NR; reagent grade Notes: recrystallized twice from chloroform
Buffer, Test Temperature, Number of Replicates	4M-HCl and sodium acetate; 28°C; Not reported
Positive Controls and Negative Controls	Positive: Not reported; Negative: Not reported
pH and Duration	0.63-5.2; Not reported
Sampling Frequency and Test Setup	Not reported; Not Reported
Concentration	Not reported
Analytical Method, Analytical Details, and Statistics	Spectrometer; Followed a decrease in optical density at 300 nm; Not reported
Transformation Products	Not reported
Reference Substance and Reference Substance Results	Not reported; Not reported
Percent Recovery, Hydrolysis Rate Constant, and Half-life	Not reported; First-order hydrolysis rate constant: 0.0079/sec at 25°C, Half-life: 1.5 minutes; Average reaction rate constant: 0.0216/sec at pH 0.63 - 5.2 and 28°C, Half-life: 32 seconds; Not reported
Results Remarks	Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	High	The purity of the test substance was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Controls were not explicitly reported.
	Metric 4:	Test Substance Stability	High	Test substance storage and preparation were reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	Limited test method details provided, may have been reported in supplemental information.
	Metric 6:	Testing Conditions	Medium	Limited test conditions reported, may have been reported in supplemental information.
	Metric 7:	Testing Consistency	Medium	Test conditions were not reported, it is assumed that they were consistent across study groups.

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Study Citation:	Hawkins, M. D. (1975). Hydrolysis of phthalic acid and 3,6-dimethylphthalic anhydrides. Journal of the Chemical Society, Perkin Transactions 2: Physical Organic Chemistry 1(4):282-284.
OECD Harmonized Template:	Hydrolysis
HERO ID:	7346841

		EVALUATION		
Domain		Metric	Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed the outcomes of interest.
	Metric 12:	Test Substance Purity	High	Sampling frequency allowed calculation of rate constants but minimal sampling details provided.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability and uncertainty were not explicitly addressed.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Very limited study details were reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were adequately described and appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Khan, M. N. (1993). Kinetics and mechanism of the aqueous cleavage of phthalic-anhydride (PAn). Indian Journal of Chemistry. Section A 32(5):387-394.
OECD Harmonized Template:	Hydrolysis
HERO ID:	5179119

EXTRACTION

Parameter	**Data**
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, Type, Guideline	None; Experimental; other: Hydrolysis in aqueous systems
Solvent, Reactivity, Storage, Stability	No; NR; NR; NR
Radiolabel, Source, State, Purity	No; Aldrich, BDH or Fluka; NR; Reagent grade
Buffer, Test Temperature, Number of Replicates	Not reported; 30°C; Not reported
Positive Controls and Negative Controls	Positive: This experiment was the control for hydrolysis in variable concentrations of HCl; Negative: Not reported
pH and Duration	Not reported; ionic strength + 1.0M; Reaction proceeded for more than 7 half-lives
Sampling Frequency and Test Setup	Not reported; Rate of hydrolysis evaluated via spectrometry and disappearance of test material at 310 nm; reaction mixture contained 2% v/v CH3CN
Concentration	2000 µmol/L
Analytical Method, Analytical Details, and Statistics	Spectrometry: absorbance at 310 nm; non-linear least squares used to calculate parameters (k obs, epsilon, A); ±reported error limits are standard deviations
Transformation Products	Not reported
Reference Substance and Reference Substance Results	Not reported; Not reported
Percent Recovery, Hydrolysis Rate Constant, and Half-life	Not reported; K obs: observed pseudo-first order rate constant=111±1x10^4 s-1; Not reported
Results Remarks	Apparent Molar absorptivity (epsilon)=745.7±4.6 M-1 cm-1; absorbance (A) at t infinity =0.005±0.004

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified by common name.
Metric 2:	Test Substance Purity	Medium	The test substance source was reported in a general manner. The purity of the test substance were not reported but this is unlikely to influence the study results.
Domain 2: Test Design			
Metric 3:	Study Controls	N/A	Key information was the control group in the study.
Metric 4:	Test Substance Stability	Low	This metric met the criteria for high confidence as expected for this type of study. QC - downgraded to 3. Preparation and storage conditions were not reported.
Domain 3: Test Conditions			
Metric 5:	Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.
Metric 6:	Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.
Metric 7:	Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.
Metric 8:	System Type and Design	N/A	Not applicable

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Study Citation:	Khan, M. N. (1993). Kinetics and mechanism of the aqueous cleavage of phthalic-anhydride (PAn). Indian Journal of Chemistry. Section A 32(5):387-394.
OECD Harmonized Template:	Hydrolysis
HERO ID:	5179119

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed the outcome of interest.
	Metric 12:	Test Substance Purity	Low	Sampling methods were not described.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	The metric met the criteria for high confidence .
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Limited details on analytical methods.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Bajt, O., Sket, B., Faganeli, J. (1992). Photochemical transformation of phthalic anhydride in natural waters. Chemosphere 24(6):673-679.
OECD Harmonized Template:	Photolysis in Water
HERO ID:	5177198

EXTRACTION

Parameter	Data
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, Type, Guideline	None; Experimental; EPA OTS 796.3700 (Direct Photolysis Rate in Water by Sunlight): Photolysis in distilled water
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Iplas Chemical Industry (Koper, Slovenia); NR; 99.8%
Duration and Test Temperature	15 days; 25°C
Light Source, Intensity, and additional light details	125 W medium pressure mercury lamp; Not reported; Lamp emits some UV (265, 297, 303, 313, and 334 nm) and significant amounts of visible light (404-408, 436, 546, and 577-579 nm)
Source Wavelength Lower and Upper	365 nm; 366 nm
Test Details and Control	Stoppered quartz test tubes (30 x 2 cm) with 90 mL solution, purged with N2 (flow rate 20 mL/min), exposed in photo chemical reactor from Applied Photophysics.; Dark control, wrapped in aluminum foil
Initial Concentration and Reference Compound	0.002 M; Phthalic anhydride in distilled water exposed to sunlight (solar radiation 18.4 kJ/cm^2)
Substance Wavelength Lower and Upper	Not reported; Not reported
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	Not Reported; Not Reported; Half-life:3.87, 9.58, 6.78 and 6.29 hours, respectively
Indirect Rate Constant Lower and Upper	Not Reported; Not Reported
Method Details Results and Products Details Results	Varian 2700 GC with FI detector and HP 3396 A integrator. 1H and 13C spectra obtained with Varian EM 360 L and Varian VXR 300 NMR spectrometers. Mass spectra obtained by Autospeq mass spectrometer.; Hydrolysis produces phthalic acid, photochemical transformation showed polymerization to polyphenil (1,4 bonded majority, 1,2 bonding minority). Small amounts of benzoic acid also observed
Parameter Value and Parameter Results	Not Reported; Not reported
Reference Compound, Reference Substance Results, Percent Degradation Results and Standard Deviation Results	Phthalic anhydride in distilled water exposed to sunlight (solar radiation 18.4 kJ/cm^2); 4% transformed after 15 days; Not reported; Not reported
Results Remarks, Sample time Results, Results Details	First-order reaction.; Not reported; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance is identified by name.
	Metric 2:	Test Substance Purity	High	The test substance source and purity are reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A dark control was included; the results from the control were not reported but are assumed to be valid.
	Metric 4:	Test Substance Stability	Medium	Test substance undergoes hydrolysis and phototransformation; storage and preparation were not reported.

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Study Citation:	Bajt, O., Sket, B., Faganeli, J. (1992). Photochemical transformation of phthalic anhydride in natural waters. Chemosphere 24(6):673-679.
OECD Harmonized Template:	Photolysis in Water
HERO ID:	5177198

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Some test conditions (pH) were not reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed the intended outcomes of interest.
	Metric 12:	Test Substance Purity	Medium	Sampling methods were not reported but this omission is not expected to affect the study outcome.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Statistical analysis between study groups was not explicitly conducted.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Analytical method was appropriate; concentrations of the target and transformation products were not reported, limits of detection and extraction efficiency were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations described in brief but appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results were reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Cannon Laboratories, (1977). Summary of BOD analyses on maleic compounds.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5160448

EXTRACTION

Parameter	Data
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: BOD 5; BOD 20
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Not reported; Not reported
Oxygen and Inoculum	aerobic; not specified: Not reported
Duration, Parameter, System, and Sampling Frequency	5 days; 20 days; O2 consumption: Not reported; Not reported
pH Adjusted and pH	Not Reported; 2.6
Concentration	3.5 g/L
Composition and Test Temperature	Not reported; Not reported
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not reported; Not Reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	Not reported; BOD 5; BOD 20; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	5100 mg/L; 7400 mg/L; Not reported; 5 days; 20 days; Not reported
Results Remarks and Results Details	O2 needed for complete oxidation: 5700 mg/L; therefore BOD 5=89%; BOD 20 =130%; Not reported
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				

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Study Citation:	Cannon Laboratories, (1977). Summary of BOD analyses on maleic compounds.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5160448

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the deviations and omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	The test organism, species, or inoculum source were not reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — Medium

Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

EXTRACTION

Parameter	**Data**
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: MITI test
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Not reported; Not reported
Oxygen and Inoculum	aerobic; activated sludge (adaptation not specified): 30mg/L sludge concentration
Duration, Parameter, System, and Sampling Frequency	2 weeks; Not Reported: Not Reported; Not Reported
pH Adjusted and pH	Not Reported; Not Reported
Concentration	100 mg/L
Composition and Test Temperature	Not reported; Not reported
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not reported; Not Reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	Not Reported; Theoretical BOD; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	85.2%; Not Reported; Not Reported; Not Reported
Results Remarks and Results Details	Not Reported; Not Reported
Results Mean Total Recovery and Results per Recovery	Not Reported; Not Reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified using common nomenclature.
Metric 2:	Test Substance Purity	Low	The test substance purity was not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	Low	Study controls were not reported.
Metric 4:	Test Substance Stability	Low	The test substance stability was not reported.
Domain 3: Test Conditions			
Metric 5:	Test Method Suitability	High	The test method was reported is appropriate.

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Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

Domain	Metric		EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Low	Testing conditions were not reported.
	Metric 7:	Testing Consistency	Medium	Testing consistency was not reported.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum used for the test method reported is appropriate.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome assessment methodology used for the reported test method is appropriate.
	Metric 12:	Test Substance Purity	High	The sampling methods were not directly reported but were likely appropriate because of the test method followed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty was not reported in the secondary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	No supporting information regarding the analytical method was reported in the secondary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not reported in the secondary source but the omission is unlikely to have a substantial impact on the study results.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Due to limited information the reasonableness of the study results was not possible.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — Medium

* Related References: NITE; Chemical Risk Information Platform (CHRIP). Biodegradation and Bioconcentration. Tokyo, Japan. Natl Inst Tech Eval. Available from, as of Jan 30, 2015: http://www.safe.nite.go.jp/english/db.html

Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

EXTRACTION

Parameter	Data
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; Not Reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Not reported; Not reported
Oxygen and Inoculum	Not Reported; other:: Sewage inoculum
Duration, Parameter, System, and Sampling Frequency	5; Not Reported: Not reported; Not reported
pH Adjusted and pH	Not Reported; Not reported
Concentration	0.5 ppm
Composition and Test Temperature	Not reported; Not reported
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Not Reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	Not Reported; Theoretical oxygen demand; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	73.46%; Not Reported; Not Reported; Not Reported
Results Remarks and Results Details	Not Reported; Not Reported
Results Mean Total Recovery and Results per Recovery	Not Reported; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified using common nomenclature.
	Metric 2:	Test Substance Purity	Low	The test substance purity was not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Low	Study controls were not reported.
	Metric 4:	Test Substance Stability	Low	The test substance stability was not reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	The test method was not clearly described.
	Metric 6:	Testing Conditions	Low	Testing conditions were not reported.
	Metric 7:	Testing Consistency	N/A	Testing consistency could not be evaluated since testing conditions were not reported.

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Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

		EVALUATION		
Domain		Metric	Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum used for the test method reported is appropriate.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome assessment methodology was not clearly described but is likely appropriate.
	Metric 12:	Test Substance Purity	High	The sampling methods were not directly reported but were likely appropriate because of the test method followed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty was not reported in the secondary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	No supporting information regarding the analytical method was reported in the secondary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not reported in the secondary source but the omission is unlikely to have a substantial impact on the study results.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information the reasonableness of the study results was not possible.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — Medium

* Related References: Swope HG, Kenna M; Sewage Ind Waste 21: 46-8 (1950)

Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

EXTRACTION

Parameter	Data
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Not reported; Not reported
Oxygen and Inoculum	aerobic; Not Reported: Not reported
Duration, Parameter, System, and Sampling Frequency	24 hours; Not Reported: Not reported; Not reported
pH Adjusted and pH	Not Reported; Not reported
Concentration	Not Reported
Composition and Test Temperature	Not reported; Not reported
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Not Reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	Not Reported; Chemical oxygen demand and total organic carbon; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	33% COD and 88% TOC; Not Reported; Not Reported; Not Reported
Results Remarks and Results Details	Not Reported; Not Reported
Results Mean Total Recovery and Results per Recovery	Not Reported; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified using common nomenclature.
	Metric 2:	Test Substance Purity	Low	The test substance purity was not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Low	Study controls were not reported.
	Metric 4:	Test Substance Stability	Low	The test substance stability was not reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	The test method was not clearly described.
	Metric 6:	Testing Conditions	Low	Testing conditions were not reported.
	Metric 7:	Testing Consistency	N/A	Testing consistency could not be evaluated since testing conditions were not reported.

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Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

		EVALUATION		
Domain		Metric	Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum used for the test method reported is appropriate.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome assessment methodology was not clearly described but is likely appropriate.
	Metric 12:	Test Substance Purity	High	The sampling methods were not directly reported but were likely appropriate because of the test method followed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty was not reported in the secondary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	No supporting information regarding the analytical method was reported in the secondary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not reported in the secondary source but the omission is unlikely to have a substantial impact on the study results.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information the reasonableness of the study results was not possible.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — Medium

* Related References: Matsui S et al; Wat Sci Tech 20: 201-10 (1988)

Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

EXTRACTION

Parameter	Data
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Not reported; Not reported
Oxygen and Inoculum	aerobic; activated sludge, domestic (adaptation not specified): Not reported
Duration, Parameter, System, and Sampling Frequency	30 days; Not Reported: Closed bottle test; Not reported
pH Adjusted and pH	Not Reported; Not reported
Concentration	Not Reported
Composition and Test Temperature	Not reported; Not reported
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Not Reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	Not Reported; Theoretical oxygen demand; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	71%; Not Reported; Not Reported; Not Reported
Results Remarks and Results Details	Not Reported; Not Reported
Results Mean Total Recovery and Results per Recovery	Not Reported; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified using common nomenclature.
	Metric 2:	Test Substance Purity	Low	The test substance purity was not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Low	Study controls were not reported.
	Metric 4:	Test Substance Stability	Low	The test substance stability was not reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was reported is appropriate.
	Metric 6:	Testing Conditions	Low	Testing conditions were not reported.
	Metric 7:	Testing Consistency	Medium	Testing consistency was not reported.

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Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

		EVALUATION		
Domain		Metric	Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum used for the test method reported is appropriate.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome assessment methodology used for the reported test method is appropriate.
	Metric 12:	Test Substance Purity	High	The sampling methods were not directly reported but were likely appropriate because of the test method followed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty was not reported in the secondary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	No supporting information regarding the analytical method was reported in the secondary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not reported in the secondary source but the omission is unlikely to have a substantial impact on the study results.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information the reasonableness of the study results was not possible.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — Medium

* Related References: OECD; SIDS initial Assessment Report For SIAM 20, Phthalic anhydride (85-44-9), April 2005. Available from, as of Jan 27, 2015: http://www.chem.unep.ch/irptc/sids/OECDSIDS/85449.pdf

Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

EXTRACTION

Parameter	Data
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Not reported; Not reported
Oxygen and Inoculum	aerobic; other:: 2 ppm sewage with seawater dilution and standard dilution.
Duration, Parameter, System, and Sampling Frequency	5 days; Not Reported: Not reported; Not reported
pH Adjusted and pH	Not Reported; Not reported
Concentration	2 ppm
Composition and Test Temperature	Not reported; Not reported
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Not Reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	Not Reported; Degradation of initial concentration; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	22% with standard dilution; 18% with seawater dilution; Not Reported; Not Reported; Not Reported
Results Remarks and Results Details	Not Reported; Not Reported
Results Mean Total Recovery and Results per Recovery	Not Reported; Not Reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified using common nomenclature.
Metric 2:	Test Substance Purity	Low	The test substance purity was not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	Low	Study controls were not reported.
Metric 4:	Test Substance Stability	Low	The test substance stability was not reported.
Domain 3: Test Conditions			
Metric 5:	Test Method Suitability	Medium	The test method was not clearly described.
Metric 6:	Testing Conditions	Low	Testing conditions were not reported.
Metric 7:	Testing Consistency	N/A	Testing consistency could not be evaluated since testing conditions were not reported.

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Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

Domain	Metric		EVALUATION Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum used for the test method reported is appropriate.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome assessment methodology was not clearly described but is likely appropriate.
	Metric 12:	Test Substance Purity	High	The sampling methods were not directly reported but were likely appropriate because of the test method followed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty was not reported in the secondary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	No supporting information regarding the analytical method was reported in the secondary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not reported in the secondary source but the omission is unlikely to have a substantial impact on the study results.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information the reasonableness of the study results was not possible.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — Medium

* Related References: Takemoto S et al; Suishitsu Odaku Kenkyu 4: 80-90 (1981)

Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

EXTRACTION

Parameter	Data
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Not reported; Not reported
Oxygen and Inoculum	aerobic; activated sludge (adaptation not specified): Not reported
Duration, Parameter, System, and Sampling Frequency	24 hours; Not Reported: Not reported; Not reported
pH Adjusted and pH	Not Reported; Not reported
Concentration	9 ppm
Composition and Test Temperature	Not reported; Not reported
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Not Reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	Not Reported; Chemical oxygen demand; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	33%; Not Reported; Not Reported; Not Reported
Results Remarks and Results Details	Not Reported; Not Reported
Results Mean Total Recovery and Results per Recovery	Not Reported; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified using common nomenclature.
	Metric 2:	Test Substance Purity	Low	The test substance purity was not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Low	Study controls were not reported.
	Metric 4:	Test Substance Stability	Low	The test substance stability was not reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	The test method was not clearly described.
	Metric 6:	Testing Conditions	Low	Testing conditions were not reported.
	Metric 7:	Testing Consistency	N/A	Testing consistency could not be evaluated since testing conditions were not reported.

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Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

Domain	Metric		EVALUATION Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum used for the test method reported is appropriate.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome assessment methodology was not clearly described but is likely appropriate.
	Metric 12:	Test Substance Purity	High	The sampling methods were not directly reported but were likely appropriate because of the test method followed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty was not reported in the secondary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	No supporting information regarding the analytical method was reported in the secondary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not reported in the secondary source but the omission is unlikely to have a substantial impact on the study results.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information the reasonableness of the study results was not possible.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — Medium

* Related References: Matsui S et al; Prog Water Technol 7: 645-59 (1975)

Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

EXTRACTION

Parameter	Data
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Not reported; Not reported
Oxygen and Inoculum	aerobic; other:: Sewage inoculum
Duration, Parameter, System, and Sampling Frequency	Not reported; Not Reported: Not reported; Not reported
pH Adjusted and pH	Not Reported; Not reported
Concentration	$\geq$ 1 - $\leq$ 4 ppm
Composition and Test Temperature	Not reported; Not reported
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Not reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	Not Reported; Theoretical BOD; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	44-78%; Not Reported; Not Reported; Not Reported
Results Remarks and Results Details	Not Reported; Not Reported
Results Mean Total Recovery and Results per Recovery	Not Reported; Not Reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified using common nomenclature.
Metric 2:	Test Substance Purity	Low	The test substance purity was not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	Low	Study controls were not reported.
Metric 4:	Test Substance Stability	Low	The test substance stability was not reported.
Domain 3: Test Conditions			
Metric 5:	Test Method Suitability	Medium	The test method was not clearly described.
Metric 6:	Testing Conditions	Low	Testing conditions were not reported.
Metric 7:	Testing Consistency	N/A	Testing consistency could not be evaluated since testing conditions were not reported.

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Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6592047

Domain	Metric		EVALUATION Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum used for the test method reported is appropriate.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome assessment methodology was not clearly described but is likely appropriate.
	Metric 12:	Test Substance Purity	High	The sampling methods were not directly reported but were likely appropriate because of the test method followed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty was not reported in the secondary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	No supporting information regarding the analytical method was reported in the secondary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not reported in the secondary source but the omission is unlikely to have a substantial impact on the study results.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information the reasonableness of the study results was not possible.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — Medium

* Related References: Heukelekian H, Rand MC; J Water Pollut Contr Assoc 29: 1040-53 (1955)

Study Citation:	Lu, P. Y., Metcalf, R. L. (1975). Environmental fate and biodegradability of benzene derivatives as studied in a model aquatic ecosystem. Environmental Health Perspectives 10:269-284.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	18726

EXTRACTION

Parameter	Data
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, Type, and Guideline	None; Calculation; other: Phthalic anhydride distribution in a model aquatic ecosystem.
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14-C-phthalic anhydride from New England Nuclear System.; NR; NR; NR Notes: NR
Test Organism and Test Organism Details	Phyto- and zooplanktons, green filamentous algae (Oedogonium cardiacum), snails (Physa), water flea (Daphnia magna), mosquito larvae (fourth instar, Culex quinquifasciatus), and mosquito fish (Gambusia affinis).; 300 daphnia, 200 fourth instar mosquito larvae, 6 snails, strands of alga, and miscellaneous plankton were acclimated in the chamber for 1 day.
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 26.7±2°C; Not reported; None
Media Type, TOC, and Salinity	not specified; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Phthalic anhydride treated water; Not reported; 0.01-0.1 ppm of radiolabeled phthalic anhydride was added to the water after 1 day of test organisms acclimating.
Test Type, Test Temperature, and Test Condition Comments	static; 26.7±2°C; 12 hours of daylight exposure (7500 lux)
Duration, Parameter, and Sampling Frequency	One day (after 48 hour acclimation period); Not Reported; One time
Concentration	greater than or equal to 0.01 - less than or equal to 0.1 ppm
Analytical Method and Analytical Details	Thin layer chromatography and autoradiography; Not reported;
Rate Constant and Results per Recovery	Not reported; Not reported
Statistics, Basis, and Calculation Basis	Not reported; Not Reported; Not Reported
Results Value and Results Details	Phthalic anhydride equivalents (ppm) in algae and in water were 2.0267 and 0.00050, respectively.; Phthalic anhydride was below detectable limits in all other organisms.
Metabolites, Reference, and Results Reference Substance	Phthalic acid was the main metabolite of phthalic anhydride and the only identified one in the study.; Not reported; Not Reported

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified using common nomenclature.
	Metric 2:	Test Substance Purity	Medium	The test substance purity was not reported but the omission is unlikely to have a substantial impact on the study results.
Domain 2: Test Design				
	Metric 3:	Study Controls	Low	No blanks or controls were reported; this may influence the interpretation of the results due to potential hydrolysis of the test material.
	Metric 4:	Test Substance Stability	Low	Potential hydrolysis of the test item was not taken into account.

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Study Citation:	Lu, P. Y., Metcalf, R. L. (1975). Environmental fate and biodegradability of benzene derivatives as studied in a model aquatic ecosystem. Environmental Health Perspectives 10:269-284.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	18726

Domain	Metric		EVALUATION Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	The testing conditions were reported and appropriate.
	Metric 7:	Testing Consistency	High	Testing conditions were consistent across the study groups.
	Metric 8:	System Type and Design	Medium	It was not clearly shown that equilibrium was established but the omission is unlikely to have a substantial impact on the study results. Lack of blank controls may call into question the validity of the results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to the study type.
	Metric 10:	Sampling Methods	High	The test organisms were described and appropriate.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome assessment methodology did not directly address the intended outcome of interest.
	Metric 12:	Test Substance Purity	Low	Some of the sampling details were not reported and this may have an impact on the study results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Uncertainty was not discussed in the study which may have an impact on the results. Lack of blank controls may call into question the validity of the results.
	Metric 14:	Health Outcomes Unrelated to Exposure	Medium	The number of study groups and organism attrition was not reported but the omission is unlikely to have an impact on the study results.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	A lipid-normalized BCF was not reported which limits the interpretation of the study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Low	Statistical analysis of the phthalic anhydride results was not reported and the omissions may have an impact on the study results.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information, evaluation of the reasonableness of the study results was not possible.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — Medium

Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	6592047

EXTRACTION

Parameter	**Data**
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, Type, and Guideline	None; Experimental; other
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Test Organism and Test Organism Details	Oedogonium (algae); Not reported
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; Not reported; Not reported; Not reported
Media Type, TOC, and Salinity	Not Reported; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Not reported; Not reported; Not reported
Test Type, Test Temperature, and Test Condition Comments	Not reported; Not reported; Not Reported
Duration, Parameter, and Sampling Frequency	Not reported; Not Reported; Not reported
Concentration	Not Reported
Analytical Method and Analytical Details	Not Reported; Not Reported;
Rate Constant and Results per Recovery	Not Reported; Not Reported
Statistics, Basis, and Calculation Basis	Not Reported; Not Reported; Not Reported
Results Value and Results Details	BCF=4,053; Not Reported
Metabolites, Reference, and Results Reference Substance	Not Reported; Not Reported; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by common nomenclature.
	Metric 2:	Test Substance Purity	Low	Test substance purity was not reported by the secondary source.
Domain 2: Test Design				
	Metric 3:	Study Controls	Low	No study controls were reported by the secondary source.
	Metric 4:	Test Substance Stability	Low	The test substance stability was not reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Low	The test method was not reported.
	Metric 6:	Testing Conditions	Low	The testing conditions were not reported.
	Metric 7:	Testing Consistency	N/A	Testing conditions were not reported so consistency could not be determined.

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Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic anhydride.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	6592047

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to the study type.
	Metric 10:	Sampling Methods	High	The test organism is appropriate for the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	N/A	The outcome assessment methodology could not be assessed due to limited reported details.
	Metric 12:	Test Substance Purity	Low	Sampling methods were not reported by the secondary source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Uncertainty was not reported by the secondary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	Medium	Attrition or health outcomes were not reported.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Details regarding the analytical method were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical methods were not reported.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information evaluation of the reasonable of the study results was not possible.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — Low

* Related References: Lu PY, Metcalf RL; Environ Health Persp 10: 269-84 (1975)

Study Citation:	Bove, J. L., Dalven, P. (1984). Pyrolysis of phthalic-acid esters: Their fate. Science of the Total Environment 36(JUN):313-318.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1333380

EXTRACTION

Parameter	**Data**
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, Type, Guideline	None; Experimental; Experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Aldrich Chemical Company; NR; NR Notes: NR
Test Method Details, Test Condition Details, and Test Consistency Details	7.5-10 minute in a 22 ml stainless steel bomb with an asbestos/copper gasket; heated in a muffle furnace; 5 runs, differences in the trials reported
System Type Design	pyrolysis of 100 mg phthalic anhydride
Sampling Frequency and Sampling Details	1 time; extracted with 50 ml of boiling benzene
Test Temperature	600°C
Results Details	Phthalic anhydride removed and several transformation products listed
Analytical Method and Analytical Details	GC/MS; Not applicable
Transformation Products, Statistics, and Kinetics	6 compounds characterized and another 4 not identified. Characterize chemical species include: Biphenyl, Fluorene, Benzophenone, 9-fluorenone, o-terphenyl, and 9-phenylfluorene.; Not reported; Not reported
Reference Substance and Reference Substance Results	Not reported; Not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by chemical name.
	Metric 2:	Test Substance Purity	High	The source of the test substance was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The metric is not applicable to this study type.
	Metric 4:	Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 6:	Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 7:	Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 8:	System Type and Design	Medium	There was some information not reported regarding the test system and design, but these omissions were not likely to have impacted the study result.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.

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Study Citation:	Bove, J. L., Dalven, P. (1984). Pyrolysis of phthalic-acid esters: Their fate. Science of the Total Environment 36(JUN):313-318.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1333380

		EVALUATION		
Domain		Metric	Rating	Comments
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Low	There was incomplete reporting of outcome assessment methods; however, the absence of details were likely to have an impact on the study results.
	Metric 12:	Test Substance Purity	Medium	There was some information not reported regarding the sampling methods, but these omissions were not likely to have impacted the study result.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Recovery of reaction products was poor and was a source of variability and uncertainty in the measurements.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Quantitative results pyrolysis products were not provided.
	Metric 16:	Statistical Methods and Kinetic Calculations	Low	Data and calculations were not presented.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results were reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination Medium

Study Citation:	Curran, M. A., Turner, R. J. (1988). Incineration of three RCRA wastes at the U.S. EPA's combustion research facility (CRF).
OECD Harmonized Template:	Miscellaneous
HERO ID:	5177408

EXTRACTION

Parameter	**Data**
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, Type, Guideline	None; Experimental; Experimental
Solvent, Reactivity, Storage, Stability	Cooled solidified waste; NR; NR; NR
Radiolabel, Source, State, Purity	NA; NR; Solid; Major waste constituents: Phthalic anhydride 5%Ash 10%Water < 1%Other constituents < 1%Polymeric materials 83% (produced from sodium carbonate, 1,4-naphthaquinone, and other impurities) Notes: Obtained from K024 waste, which is the distillation bottoms from phthalic anhydride production from naphthalene.
Test Method Details, Test Condition Details, and Test Consistency Details	Solid waste containing the test substance was incinerated in a RCRA-permitted pilot-scale rotary kiln incinerator; K024 waste; pH maintained > 7 with sodium hydroxide. Incinerator run for 3 days, parameters reported for each day.Waste feed rate: 53, 108, and 108 lb/hKiln mean temperature: 931, 1037, and 974°CAfterburner mean temperature: 1124, 1107, and 1101°C
System Type Design	Pilot-scale rotary kiln incinerator 2.5 million BTU/hr, 1 hour solids retention time at 0.5 rpm. System comprised of a kiln, afterburner, venturi scrubber, packed tower, charcoal bed, HEPA filter, and I.D. fan at effluent point.
Sampling Frequency and Sampling Details	Manual and automated monitoring of kiln conditions recorded every 15 min or 20 sec. Grab sample frequency NR.; Grab samples collected from waste feed, rotary kiln ash, scrubber makeup water, and scrubber blowdown
Test Temperature	1,000°C (kiln chamber), 1200°C (afterburner chamber)
Results Details	Feed concentration: 2,600 - 29,000 µg/gAsh and scrubber water effluents: Not detected
Analytical Method and Analytical Details	Not reported; Not reported
Transformation Products, Statistics, and Kinetics	Not reported; Not reported; Not reported
Reference Substance and Reference Substance Results	Not applicable; Not applicable

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	High	The waste source and composition was reported and the presence of other constituents is not likely to impact test results.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	A concurrent negative control is not required for pilot incineration studies.
	Metric 4:	Test Substance Stability	High	The test substance preparation was reported and was appropriate for the study.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	The test conditions (temperature and qualitative pH) were reported and appropriate for the study.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.

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Study Citation:	Curran, M. A., Turner, R. J. (1988). Incineration of three RCRA wastes at the U.S. EPA's combustion research facility (CRF).
OECD Harmonized Template:	Miscellaneous
HERO ID:	5177408

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment addressed the outcomes of interest.
	Metric 12:	Test Substance Purity	High	Sampling methods were appropriate for the outcomes of interest and sampling methods were widely accepted.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Sources of variability and uncertainty were not explicitly accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical initial and final concentrations were reported; analytical methods were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical and kinetic calculations not conducted.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Midwest Research Institute, (1984). Performance evaluation of full-scale hazardous waste incinerators - Volume I (excutive summary) contract no. 68-02-3177 (43).
OECD Harmonized Template:	Miscellaneous
HERO ID:	1269556

EXTRACTION

Parameter	**Data**
CASRN and Test Material	85-44-9; Phthalic anhydride
Confidentiality, Type, Guideline	None; Experimental; Experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Test Method Details, Test Condition Details, and Test Consistency Details	Destruction or Removal Efficiency (DRE) was determined for selected pollutants in a Ross System incinerator at Ross Incineration Services, Inc., in Grafton, Ohio; Residence time: 6.2 - 6.7 secHeat input: 60 - 87E6 kJ/hrExcess oxygen in stack: 10.4 - 10.7%; Waste feed heating value: 19,710 - 20,400 kJ/kg (liquid organic), 4,090-4520 kJ/kg (aqueous)Moisture: 35 - 48% (liquid organic), 94 - 97% (aqueous)
System Type Design	Rotary kiln, main combustion chamber, water spray, quench, packed towers, electrified scrubber
Sampling Frequency and Sampling Details	NR, 3 sample runs collected.; Liquid and solid feed collected as grab samples. Stack effluent collected by modified method 5 (MM5): XAD-2 resin traps with particulate filter
Test Temperature	1117 - 1154°C
Results Details	DRE: > 99.99, waste feed < 100 µg/g in one run and DRE not determined.
Analytical Method and Analytical Details	GC/ECD (waste feeds); GC/MS (MM5 gas samples); Waste feeds mixed with tetraglyme and reagent water prior to analysis. Traps were Soxhlet-extracted with methylene chloride, dried with anhydrous sodium sulfate, concentrated using Kuderna-Danish evaporation, with N2.
Transformation Products, Statistics, and Kinetics	Not reported; Linear regression comparison to DRE and starting concentration; no compounds below 200 ug/g in waste feed achieved DRE > 99.99%, correlation coefficient for regression line: - 0.84; Not reported
Reference Substance and Reference Substance Results	MM5 blank samples; Values blank corrected

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The chemical of interest was identified by name.
	Metric 2:	Test Substance Purity	High	Sample source was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Field blanks were included and results were blank corrected.
	Metric 4:	Test Substance Stability	Medium	Sample processing was reported for some samples, storage was not reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	The system stages and appropriate operational parameters were reported.
	Metric 7:	Testing Consistency	High	Samples were collected, processed, and analyzed consistently.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.

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Study Citation:	Midwest Research Institute, (1984). Performance evaluation of full-scale hazardous waste incinerators - Volume I (excutive summary) contract no. 68-02-3177 (43).
OECD Harmonized Template:	Miscellaneous
HERO ID:	1269556

Domain		Metric	EVALUATION Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining DRE.
	Metric 12:	Test Substance Purity	High	Sampling methods were appropriate and sampled feed and effluents.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	No significant sources of uncertainty were identified. Study is very thorough.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The analytical methods were appropriate; extraction efficiencies were reported. Limits of detection were not reported explicitly.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods were described and applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable, although the study authors noted their purpose was not to determine operational parameters effects on DRE, only normal DRE under standard conditions.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Stalport, F., Guan, Y. Y., Coll, P., Szopa, C., Macari, F., Raulin, F., Chaput, D., Cottin, H. (2010). UVolution, a photochemistry experiment in low earth orbit: Investigation of the photostability of carboxylic acids exposed to mars surface UV radiation conditions. Astrobiology 10(4):449-461.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	6816325

EXTRACTION

Parameter	Data
CASRN and Test Material	Not reported; Phthalic acid
Confidentiality, Type, Guideline	none; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Duration and Test Temperature	29 solar hours; Not applicable
Light Source, Intensity, and additional light details	sun; not reported; Samples contained in cell with quartz window
Source Wavelength Lower and Upper	220; 280
Test Details and Control	Cells were exposed in Foton capsule orbiting the Earth.; Not reported
Initial Concentration, Reference Compound	Not reported Not Reported; not reported
Substance Wavelength Lower and Upper	not applicable; not applicable
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	not reported; not applicable; not applicable
Indirect Type Results, Indirect Rate Constant Lower and Upper	not applicable; not applicable; not applicable
Method Details Results and Products Details Results	Scans completed before and after exposure. Dark control included to quantify the contribution of sublimation, thermodecomposition and thermodesorption.; not reported
Parameter Value and Parameter Results	258 hours; half-life
Reference Substance Results, Percent Degradation Results and Standard Deviation Results	not applicable; not reported; ±63 hours
Results Remarks, Sample time Results, Results Details	Extrapolated results indicate 218-925 hour half-life under the UV flux expected at the surface of Mars.; Not Reported; Not Reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
Metric 2:	Test Substance Purity	Medium	The test substance source was not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Stalport, F., Guan, Y. Y., Coll, P., Szopa, C., Macari, F., Raulin, F., Chaput, D., Cottin, H. (2010). UVolution, a photochemistry experiment in low earth orbit: Investigation of the photostability of carboxylic acids exposed to mars surface UV radiation conditions. Astrobiology 10(4):449-461.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	6816325

Domain	Metric		EVALUATION Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions, however, sufficient data were reported to determine that the omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were consistent with related physical chemical properties.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Stalport, F., Guan, Y. Y., Coll, P., Szopa, C., Macari, F., Raulin, F., Chaput, D., Cottin, H. (2010). UVolution, a photochemistry experiment in low earth orbit: Investigation of the photostability of carboxylic acids exposed to mars surface UV radiation conditions. Astrobiology 10(4):449-461.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	6816325

EXTRACTION

Parameter	**Data**
CASRN and Test Material	Not reported; Phthalic acid
Confidentiality, Type, Guideline	none; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Duration and Test Temperature	not reported; not reported
Light Source, Intensity, and additional light details	not reported; not reported; The UV flux and spectrum were provided and measured with a monochromator.
Source Wavelength Lower and Upper	190 nm; 400 nm
Test Details and Control	Samples contained in cell with MgF2 window.; The UV flux and spectrum were provided by the LOT-ORIEL company and measured with a Jobin Yvon monochromator.
Initial Concentration, Reference Compound	not reported; not reported
Substance Wavelength Lower and Upper	Not Reported; Not Reported
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	not reported; not applicable; not applicable
Indirect Type Results, Indirect Rate Constant Lower and Upper	not applicable; not applicable; not applicable
Method Details Results and Products Details Results	The evolution of the samples was measured by transmission infrared spectroscopy.; not reported
Parameter Value and Parameter Results	41 hour; half-life
Reference Substance Results, Percent Degradation Results and Standard Deviation Results	not applicable; not reported; ±7 hours
Results Remarks, Sample time Results, Results Details	Not Reported; not reported; Photolysis followed a first-order decay.

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
Metric 2:	Test Substance Purity	Medium	The test substance source was not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions			

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Study Citation:	Stalport, F., Guan, Y. Y., Coll, P., Szopa, C., Macari, F., Raulin, F., Chaput, D., Cottin, H. (2010). UVolution, a photochemistry experiment in low earth orbit: Investigation of the photostability of carboxylic acids exposed to mars surface UV radiation conditions. Astrobiology 10(4):449-461.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	6816325

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to the study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were consistent with related physical chemical properties.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — High

Study Citation:	Stalport, F., Guan, Y. Y., Coll, P., Szopa, C., Macari, F., Raulin, F., Chaput, D., Cottin, H. (2010). UVolution, a photochemistry experiment in low earth orbit: Investigation of the photostability of carboxylic acids exposed to mars surface UV radiation conditions. Astrobiology 10(4):449-461.
OECD Harmonized Template:	Photolysis in Soil
HERO ID:	6816325

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, Type, Guideline	none; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Duration and Test Temperature	29 solar hours; not reported
Light Source, Intensity, and additional light details	sun; not reported; not reported; Samples contained in cell with quartz window.
Source Wavelength Lower and Upper	220; 280
Test Details and Control	Cells were exposed in Foton capsule orbiting the Earth.; Dark control included to quantify the contribution of sublimation, thermodecomposition and thermodesorption.
Initial Concentration, Reference Compound	not reported; not applicable
Substance Wavelength Lower and Upper	not applicable; not applicable
Moisture and Soil Details	not reported; Mars analog soil JSC Mars-1.
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	not reported; not applicable; not applicable
Reference Compound, Method Details Results, and Products Details Results	not applicable; Scans completed before and after exposure.; not reported
Analytical Method and Analytical Details	UV/visible spectrophotometer; Fourier transform infrared spectroscopy; The IR spectrum of each sample was obtained by transmission through the quartz window. A background measurement was performed with an empty cell. The acquisition range was set between 4000 and 2080/cm.
Parameter Value and Parameter Results	167 hours; half-life
Reference Substance Results, Percent Degradation Results and Standard Deviation Results	not reported; not reported; ±20 hours
Results Remarks, Sample time Results, Results Details	Extrapolated results indicate 506±64 hour half-life under the UV flux expected at the surface of Mars.; not reported; Not Reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	High	A concurrent control was included.
Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Stalport, F., Guan, Y. Y., Coll, P., Szopa, C., Macari, F., Raulin, F., Chaput, D., Cottin, H. (2010). UVolution, a photochemistry experiment in low earth orbit: Investigation of the photostability of carboxylic acids exposed to mars surface UV radiation conditions. Astrobiology 10(4):449-461.
OECD Harmonized Template:	Photolysis in Soil
HERO ID:	6816325

Domain	Metric		EVALUATION Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	The test method was suitable for the test substance with minor deviations.
	Metric 6:	Testing Conditions	Medium	There were reported deviations or omissions in testing conditions; however, sufficient data were reported to determine that the deviations and omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples. The conditions of the exposure were documented.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	Medium	Minor limitations were identified in sampling methods of the outcome of interest were reported; however, the limitations were not likely to have a substantial impact on results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Sources of variability and uncertainty in the measurements were not considered resulting in some uncertainty.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	There was insufficient evidence presented to confirm that parent compound disappearance was not likely due to some other process.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results were reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — Medium

Study Citation:	Battersby, N. S., Wilson, V. (1989). Survey of the anaerobic biodegradation potential of organic chemicals in digesting sludge. Applied and Environmental Microbiology 55(2):433-439.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1598869

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Aldrich Chemical Co., Gillingham or BDH Ltd., Poole, UK. Chemicals.; NR; Highest purity available Notes: NR
Blank and Control	Sterile controls containing autoclaved sludge and sterile test chemical; Not Reported
Oxygen and Inoculum	anaerobic; digested sludge: Reading Sewage Works (Berkshire, England); mixture of domestic and industrial(brewing, food processing, electronics) wastewaters.
Duration, Parameter, System, and Sampling Frequency	60 days; CH4 evolution: serum bottles under a headspace of 90% N2-10% CO2; weekly
pH Adjusted and pH	NR; NR
Concentration	NR NR - NR NR NR
Composition and Test Temperature	NR; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	NR; NR; NR; NR
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	gas chromatograph with thermal conductivity detector; % theoretical gas production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	135; ±7.5; Not Reported; ethanol: results not reported; 4-cresol: 96% theoretical gas production after a lag period of 7 days
Results Remarks and Results Details	Completely degraded after 4 weeks of incubation.; lag period of 9 days
Results Mean Total Recovery and Results per Recovery	NR; NR

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source of the test substance was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Some concurrent control group details were not included; however, the lack of data was not likely to have a substantial impact on study results.

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Study Citation:	Battersby, N. S., Wilson, V. (1989). Survey of the anaerobic biodegradation potential of organic chemicals in digesting sludge. Applied and Environmental Microbiology 55(2):433-439.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1598869

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the deviations and omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	Medium	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	Medium	The system type and design were capable of appropriately maintaining substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements and statistical techniques were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Kinetic calculations were not clearly described; howeverthese differences were not likely to have a substantial impact on study results.
Domain 8: Other				

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Study Citation:	Battersby, N. S., Wilson, V. (1989). Survey of the anaerobic biodegradation potential of organic chemicals in digesting sludge. Applied and Environmental Microbiology 55(2):433-439.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1598869

EVALUATION

Domain	Metric		Rating	Comments
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range as defined by reference substance.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination High

Study Citation:	Cannon Laboratories, (1977). Summary of BOD analyses on maleic compounds.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5160448

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: BOD 5; BOD 20
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Not reported; Not reported
Oxygen and Inoculum	aerobic; not specified: Not reported
Duration, Parameter, System, and Sampling Frequency	5 days; 20 days; O2 consumption: Not reported; Not reported
pH Adjusted and pH	Not Reported; 2.6
Concentration	6.9 g/L
Composition and Test Temperature	Not reported; Not reported
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not reported; Not Reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	Not reported; BOD 5; BOD 20; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	6400 mg/L; 10,000 mg/L; Not reported; 5 days; 20 days; Not reported
Results Remarks and Results Details	O2 needed for complete oxidation: 10,000 mg/L; therefore BOD 5=64%; BOD 20 =100%; Not reported
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified by name.
Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions			

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Study Citation:	Cannon Laboratories, (1977). Summary of BOD analyses on maleic compounds.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5160448

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the deviations and omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	The test organism, species, or inoculum source were not reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Fujita, M., Ike, M., Ishigaki, T., Sei, K., Jeong, J. S., Makihira, N., Lertsirisopon, R. (2005). Biodegradation of Three Phthalic Acid Esters by Microorganisms from Aquatic Environment. Nihon Mizushori Seibutsu Gakkaishi 41(4):193-201.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5490395

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; other; Experimental; other: Primary biodegradation in sludge, river water, and pond water
Solvent, Reactivity, Storage, Stability	Ethanol; NR; NR; NR
Radiolabel, Source, State, Purity	No; Wako Pure Chemical Ind., Osaka; NR; Analytical grade
Blank and Control	Controls without the inoculum; Controls with inoculum and no test substance; Controls were included
Oxygen and Inoculum	aerobic; other:: Tests run in activated sludge, river water, and pond water. Activated sludge was collected from domestic sewage treatment plants and water samples were collected from two rivers and three ponds and were not acclimatized.
Duration, Parameter, System, and Sampling Frequency	14 days (2 weeks); test mat.: plugged flask; Days 0, 1, 4, 7, 10, and 14
pH Adjusted and pH	Not Reported; 7.2
Concentration	ca. 10 - ca. 40 mg/L
Composition and Test Temperature	artificial river water: K2HPO4: 21.8mg; KH2PO4: 8.5mg; Na2HPO4-12H20: 44.6mg; NH4Cl: 17mg; MgSO4-7H20: 22.5 mg; CaCl2: 27.5mg; FeCl3-6H20: 0.25mg; MnSO4-5H20: 0.71mg; ZnSO4-7H20: 0.01mg; CuSO4-5H20: 5mg; CoCl2 6H20: 5mg; 1L water.; 28°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	not reported; The flask was closed and not aerated after the start of the sampling period. The flasks were shaken (120 rpm) over 2 weeks.; yes; Mixed liquor suspended solids for activated sludge: 100 mg/L; 25 mg/L for river and water samples.
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	HPLC (UV-8010 spectrophotometric detector). Samples mixed with ethanol (0.5 mL). PA was detected at wavelength of 254 nm. Metabolites were detected with LC-MS (QP8000a).; Primary biodegradation as % removed to the initial concentration: Activated Sludge, River Water Microbes, Pond Water Microbes; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	100%, 100%, 100%; not reported; 2 weeks; No significant change was observed
Results Remarks and Results Details	All samples underwent primary biodegradation. Blank tests showed no significant phthalic acid contamination and controls without inoculum showed no significant degradation.; Half-lives for primary degradation were less than 3 days (results shown in figure plots). Activated sludge samples degraded to below detection limits within 10 days. Similar capacity of PA biodegradation rates were observed in river and pond water samples.
Results Mean Total Recovery and Results per Recovery	not reported; not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Appropriate blanks and controls were used.

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Study Citation:	Fujita, M., Ike, M., Ishigaki, T., Sei, K., Jeong, J. S., Makihira, N., Lertsirisopon, R. (2005). Biodegradation of Three Phthalic Acid Esters by Microorganisms from Aquatic Environment. Nihon Mizushori Seibutsu Gakkaishi 41(4):193-201.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5490395

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 4:	Test Substance Stability	High	The test substance preparation and storage conditions were reported and appropriate.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	The testing conditions were reported and appropriate.
	Metric 7:	Testing Consistency	High	The test conditions were consistent across the study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum types were described and were appropriate for the test.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The sampling methods and frequency were reported and appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	No confounding variables were noted. Uncertainty was not reported in the measurements but the omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The data reporting was sufficient and evidence was provided to show the test substance disappearance was not due to another process.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	A first order kinetic model was used to describe the biodegradation rates.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results are reasonable as compared to other reported values.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — High

Study Citation:	Fujita, M., Ike, M., Ishigaki, T., Sei, K., Jeong, J. S., Makihira, N., Lertsirisopon, R. (2005). Biodegradation of Three Phthalic Acid Esters by Microorganisms from Aquatic Environment. Nihon Mizushori Seibutsu Gakkaishi 41(4):193-201.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5490395

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; inherent biodegradability; Experimental; other: Ultimate biodegradation in sludge, river water, and pond water
Solvent, Reactivity, Storage, Stability	Ethanol; NR; NR; NR
Radiolabel, Source, State, Purity	No; Wako Pure Chemical Ind., Osaka; NR; Analytical grade
Blank and Control	Blanks without the test substance were analyzed.; Controls were included.
Oxygen and Inoculum	aerobic; other:: Tests were done using microbes from activated sludge, river water, and pond water as inoculum. Activated sludge was collected from domestic sewage treatment plants and water samples were collected from two rivers and three ponds and were not acclimatized.
Duration, Parameter, System, and Sampling Frequency	14 days (2 weeks); ThOD: plugged flasks; Days 0, 1, 4, 7, 10, and 14
pH Adjusted and pH	Not Reported; 7.2
Concentration	ca. 10 - ca. 40 mg/L
Composition and Test Temperature	artificial river water: K2HPO4: 21.8mg; KH2PO4: 8.5mg; Na2HPO4 12H20: 44.6mg; NH4Cl: 17mg; MgSO4 78H20: 22.5 mg; CaCl2: 27.5mg; FeCl 6H20: 0.25mg; 1L water.; 28°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	not reported; The flask was closed and not aerated after the start of the sampling period. The flasks were mixed with magnetic mixers (900 rpm).; yes; Biochemical oxygen demand was measured. The DEHP concentration was 40mg/L in activated sludge test and 10mg/L in the river and pond water test.
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	BOD analyzer (DDK, Tokyo) was used to determine ultimate biodegradation. HPLC (UV-8010 spectrophotometric detector). Samples mixed with ethanol (0.5 mL). PA was detected at wavelength of 254 nm. Metabolites were detected with LC-MS (QP8000a).; Ultimate Biodegradation as % of O2 consumption relative to ThBOD: Activated Sludge, River Water Microbes, Pond Water Microbes; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	Ranges estimated from figure: 40-50%, 20-35% , 20-35%; not reported; 2 weeks; Results adjusted for the results of the control test.
Results Remarks and Results Details	Ultimate biodegradation was not achieved in any of the samples within the 14 day test period.; Ultimate biodegradation half-life (days) in activated sludge microbes 9-18; river water microbes: 11-18; and pond water microbes: 21-37 (all estimated from figure).
Results Mean Total Recovery and Results per Recovery	not reported; not reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design			
Metric 3:	Study Controls	High	Appropriate concurrent blanks and controls were used.
Metric 4:	Test Substance Stability	High	The test substance preparation and storage conditions were reported and appropriate.
Domain 3: Test Conditions			

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Study Citation:	Fujita, M., Ike, M., Ishigaki, T., Sei, K., Jeong, J. S., Makihira, N., Lertsirisopon, R. (2005). Biodegradation of Three Phthalic Acid Esters by Microorganisms from Aquatic Environment. Nihon Mizushori Seibutsu Gakkaishi 41(4):193-201.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5490395

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	The testing conditions were reported and appropriate.
	Metric 7:	Testing Consistency	High	The test conditions were consistent across the study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum types were described and were appropriate for the test.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The sampling methods and frequency were reported and appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	No confounding variables were noted. Uncertainty was not reported in the measurements but the omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The data reporting was sufficient and evidence was provided to show the test substance disappearance was not due to another process.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	A first order kinetic model was used to describe the biodegradation rates.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results are reasonable as compared to other reported values.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — High

Study Citation:	Kleerebezem, R., Pol, L. W., Lettinga, G. (1999). Anaerobic biodegradability of phthalic acid isomers and related compounds. Biodegradation 10(1):63-73.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1798772

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: anaerobic degradation
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Merck, Darmstadt, Germany; NR; analytical grade; ≥95% Notes: Disodium phthalate
Blank and Control	Blanks (no substrate dosed); Not included.
Oxygen and Inoculum	anaerobic; other:: Granular biomass from starch processing waste treatment; Internal Circulation Reactor; 114 g/kg volatile solids(VS); 31% ash content; Methanogenic activity 0.59 g/COD/gVS/day.
Duration, Parameter, System, and Sampling Frequency	Not reported; CH4 evolution/test mat.: Nutrients, sludge and substrate were dosed to the serum bottles, sealed and capped. 1 ml of a 30 g Na2S.7–9H2O/L was dosed to the medium to ensure anaerobic conditions in the bottle.; Not reported
pH Adjusted and pH	Not reported; Not reported
Concentration	2.1 mmol/L
Composition and Test Temperature	NaHCO3 (4000 mg/L), NH4Cl (280 mg/L), K2HPO4 (250 mg/L), MgSO4.7H2O (100 mg/L), CaCl2.2H2O (10 mg/L), yeast extract (18 mg/L) and one milliliter of a trace element stock solution.; 37°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	NR; NR; yes; The headspace was replaced by a mixture of N2/CO2 in a ratio of 70/30.
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	CH4 content by GC-FID; Test material by HPLC; Time required to degrade 50%; 49 days
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	±8 day; NR; NR; NR
Results Remarks and Results Details	NR; NR
Results Mean Total Recovery and Results per Recovery	NR; NR

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported
Domain 2: Test Design			
Metric 3:	Study Controls	High	A concurrent control was included.
Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Kleerebezem, R., Pol, L. W., Lettinga, G. (1999). Anaerobic biodegradability of phthalic acid isomers and related compounds. Biodegradation 10(1):63-73.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1798772

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source were reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Kleerebezem, R., Pol, L. W., Lettinga, G. (1999). Anaerobic biodegradability of phthalic acid isomers and related compounds. Biodegradation 10(1):63-73.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1798772

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: anaerobic degradation
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Merck, Darmstadt, Germany; NR; analytical grade; ≥95% Notes: Disodium phthalate
Blank and Control	Blanks (no substrate dosed); Not included.
Oxygen and Inoculum	anaerobic; other:: Completely Stirred Tank Reactor; 16.2 g/kg volatile solids(VS); 37% ash content; Methanogenic activity 0.20 g/COD/gVS/day.
Duration, Parameter, System, and Sampling Frequency	Not reported; CH4 evolution/test mat.: Nutrients, sludge and substrate were dosed to the serum bottles, sealed and capped. 1 ml of a 30 g Na2S.7–9H2O/L was dosed to the medium to ensure anaerobic conditions in the bottle.; Not reported
pH Adjusted and pH	Not reported; Not reported
Concentration	2.1 mmol/L
Composition and Test Temperature	NaHCO3 (4000 mg/L), NH4Cl (280 mg/L), K2HPO4 (250 mg/L), MgSO4.7H2O (100 mg/L), CaCl2.2H2O (10 mg/L), yeast extract (18 mg/L) and one milliliter of a trace element stock solution.; 37°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	NR; NR; yes; The headspace was replaced by a mixture of N2/CO2 in a ratio of 70/30.
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	CH4 content by GC-FID; Test material by HPLC; Time required to degrade 50%; 17 days
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	±1 day; NR; NR; NR
Results Remarks and Results Details	NR; NR
Results Mean Total Recovery and Results per Recovery	NR; NR

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design			
Metric 3:	Study Controls	High	A concurrent control was included.
Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions			
Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.

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Study Citation:	Kleerebezem, R., Pol, L. W., Lettinga, G. (1999). Anaerobic biodegradability of phthalic acid isomers and related compounds. Biodegradation 10(1):63-73.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1798772

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source were reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Kleerebezem, R., Pol, L. W., Lettinga, G. (1999). Anaerobic biodegradability of phthalic acid isomers and related compounds. Biodegradation 10(1):63-73.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1798772

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: anaerobic degradation
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Merck, Darmstadt, Germany; NR; analytical grade; ≥95% Notes: Disodium phthalate
Blank and Control	Blanks (no substrate dosed); Not included.
Oxygen and Inoculum	anaerobic; other:: Granular biomass from paper mill waste treatment; Upflow Anaerobic Sludge Bed Reactor; 118 g/kg volatile solids(VS); 19% ash content; Methanogenic activity 0.78 g/COD/gVS/day.
Duration, Parameter, System, and Sampling Frequency	Not reported; CH4 evolution/test mat.: Nutrients, sludge and substrate were dosed to the serum bottles, sealed and capped. 1 ml of a 30 g Na2S.7–9H2O/L was dosed to the medium to ensure anaerobic conditions in the bottle.; Not reported
pH Adjusted and pH	Not reported; Not reported
Concentration	2.1 mmol/L
Composition and Test Temperature	NaHCO3 (4000 mg/L), NH4Cl (280 mg/L), K2HPO4 (250 mg/L), MgSO4.7H2O (100 mg/L), CaCl2.2H2O (10 mg/L), yeast extract (18 mg/L) and one milliliter of a trace element stock solution.; 37°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	NR; NR; yes; The headspace was replaced by a mixture of N2/CO2 in a ratio of 70/30.
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	CH4 content by GC-FID; Test material by HPLC; Time required to degrade 50%; 16 days
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	±2 day; NR; NR; NR
Results Remarks and Results Details	NR; NR
Results Mean Total Recovery and Results per Recovery	NR; NR

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				

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Study Citation:	Kleerebezem, R., Pol, L. W., Lettinga, G. (1999). Anaerobic biodegradability of phthalic acid isomers and related compounds. Biodegradation 10(1):63-73.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1798772

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source were reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Levén, L., Schnürer, A. (2005). Effects of temperature on biological degradation of phenols, benzoates and phthalates under methanogenic conditions. International Biodeterioration & Biodegradation 55(2):153-160.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2891344

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; other; experimental; other: Not reported; mineralization in anaerobic batch systems with mesophilic inoculum
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: labeled and unlabeled forms were used concurrently
Blank and Control	Blank without addition of test substance for background level determination and sterile controls; Not reported
Oxygen and Inoculum	anaerobic; activated sludge (adaptation not specified): Inoculum from mesophilic biogas reactor started with cow manure inoculum and fed for 5 years with household wastes
Duration, Parameter, System, and Sampling Frequency	21 weeks; test mat.: 118 mL cultivation bottles, sealed with butyl rubber stoppers and aluminum caps; Weekly
pH Adjusted and pH	Not Reported; Not reported
Concentration	0.5 mM
Composition and Test Temperature	KH2PO4, Na2HPO4, resazurin, NaSeO3/Na2WO4, yeast extract, vitamin B12, folic acid, lipoic acid, nicotinamide, p-aminobenzoic acid, pyridoxine-HCl, panthothemic acid, riboflavin, thiamine-HCl, pyridoxamine-2HCl, nicotinic acid; 37°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Hydraulic retention time: 30 d; loading rate: 3.0 g VS (L/d)
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	HPLC, analytes separated on SB-C18 column: samples were centrifuged, supernatant was acidified with H3PO4 and analyzed. Methane analyzed by GC-FID.; CH4 evolution; Not reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	78±36 days; Not reported; Not reported; Not reported
Results Remarks and Results Details	Degree of mineralization was independent of the substance tested and ranged from 0 - 97%. No mineralization was observed under similar conditions with thermophilic inoculum. Mineralization based on methane production difficult to determine based on high endogenous methane evolution (controls sometimes exceeded test substance systems).; Lag phase: 46±29 days
Results Mean Total Recovery and Results per Recovery	94%; Not reported

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source but not purity were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Sterile and blank controls were included, however endogenous methane production was often higher than test systems.

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Study Citation:	Levén, L., Schnürer, A. (2005). Effects of temperature on biological degradation of phenols, benzoates and phthalates under methanogenic conditions. International Biodeterioration & Biodegradation 55(2):153-160.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2891344

		EVALUATION		
Domain	Metric		Rating	Comments
	Metric 4:	Test Substance Stability	Medium	Test substance preparation and storage conditions were not reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Appropriate testing conditions were reported (temperature, duration), some parameters were omitted (pH).
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups
	Metric 8:	System Type and Design	N/A	Not applicable.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum cultivation procedure was reported and is similar to inoculum sources used for this study type.
	Metric 10:	Sampling Methods	N/A	Not applicable.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining mineralization.
	Metric 12:	Test Substance Purity	Medium	Sampling methods for methane were not well characterized; sample frequency was appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Mineralization could not be determined based on high endogenous methane production, and test substance disappearance was not reported.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	Not applicable.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	The analytical methods were appropriate; extraction efficiency was reported. Raw data was not reported. Mass balance and limits of detection were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical or kinetic calculations were not conducted.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Percent degradation or mineralization were not reported, and mineralization may not have been able to be determined based on high endogenous CH4 production. Lag periods and time periods for mineralization were reported but with no context.
	Metric 18:	QSAR Models	N/A	Not applicable.

Overall Quality Determination Medium

Study Citation:	Michigan State University, (1981). Development of test for determining anaerobic biodegradation potential.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6320824

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; Not Reported; Experimental; other: Biodegradation survey with proposed ASTM method described as a starting point
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Blanks (no test material); Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: 10% sewage sludge (1.53% organic matter Adrian waste treatment plant) prepared in mineral salts medium
Duration, Parameter, System, and Sampling Frequency	8 weeks; Not reported: glass bottles; methane production monitored weekly
pH Adjusted and pH	Not Reported; Not reported
Concentration	Not Reported
Composition and Test Temperature	mineral salts medium: 272 mg KH2PO4, 348 mg K2HPO4, 535 mg NH4Cl, 73.5 mg CaCl2.2H2O, 101.5 mg MgCl2.6H2O, 20 mg FeCl2.4H2O, trace metals solution, 1.2 mg NaHCO3, 120 mg Na2S.9H2O (autoclaved); 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Not reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-FID; limit of detection ca. 0.5 ppm; results; Theoretical methane production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	99%; Not reported; Not reported; CH4 production in sludge 92% and 96% after 2 weeks; 81% and 84% after 4 weeks
Results Remarks and Results Details	Not reported; Lag time: 5 weeks. Test duration up to 14 weeks in total.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively.
	Metric 2:	Test Substance Purity	Low	The source and purity of the test substance were not reported or verified by analytical means.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Toxicity controls were not reported.
	Metric 4:	Test Substance Stability	Low	The test substance stability, homogeneity, preparation, and storage conditions were not reported and these factors likely influenced the test substance or are likely to have a substantial impact on the study results.

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Study Citation:	Michigan State University, (1981). Development of test for determining anaerobic biodegradation potential.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6320824

Domain	Metric		EVALUATION Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Low	Limited details on testing conditions (pH and darkness not reported).
	Metric 7:	Testing Consistency	High	Reported test conditions were consistent.
	Metric 8:	System Type and Design	Medium	Limited detail.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	Microbial viability not validated.
	Metric 10:	Sampling Methods	N/A	This metric is not applicable to this type of study.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	There was incomplete reporting of outcome assessment methods.
	Metric 12:	Test Substance Purity	Medium	Limited details reported, sampling times generally reported (weekly, routinely).
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Uncertainties in analytical methods were generally noted.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric is not applicable to this type of study.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Analytical detail minimal, extraction efficiency, percent recovery, or mass balance were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric is not applicable to this type of study.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information, evaluation of the reasonableness of the study results was not possible.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to this type of study.

Overall Quality Determination — Low

Study Citation:	Michigan State University, (1981). Development of test for determining anaerobic biodegradation potential.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6320824

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; Not Reported; Experimental; other: Biodegradation survey with proposed ASTM method described as a starting point
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Blanks (no test material); Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: 10% sewage sludge (1.99% organic matter Jackson waste treatment plant) prepared in mineral salts medium
Duration, Parameter, System, and Sampling Frequency	8 weeks; Not reported: glass bottles; methane production monitored weekly
pH Adjusted and pH	Not Reported; Not reported
Concentration	Not Reported
Composition and Test Temperature	mineral salts medium: 272 mg KH2PO4, 348 mg K2HPO4, 535 mg NH4Cl, 73.5 mg CaCl2.2H2O, 101.5 mg MgCl2.6H2O, 20 mg FeCl2.4H2O, trace metals solution, 1.2 mg NaHCO3, 120 mg Na2S.9H2O (autoclaved); 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Not reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-FID; limit of detection ca. 0.5 ppm; results; Theoretical methane production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	100%; Not reported; Not reported; CH4 production in Jackson-90 sludge 87% and 90% after 2 weeks; 198% after 4 weeks (glucose); CH4 production in Jackson-25 sludge 80% and 99% after 2 weeks; 203% after 4 weeks (glucose)
Results Remarks and Results Details	Not reported; Lag time: 4 weeks. Test duration up to 14 weeks in total.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively.
	Metric 2:	Test Substance Purity	Low	The source and purity of the test substance were not reported or verified by analytical means.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Toxicity controls were not reported.
	Metric 4:	Test Substance Stability	Low	The test substance stability, homogeneity, preparation, and storage conditions were not reported and these factors likely influenced the test substance or are likely to have a substantial impact on the study results.
Domain 3: Test Conditions				

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Study Citation:	Michigan State University, (1981). Development of test for determining anaerobic biodegradation potential.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	6320824

EVALUATION

Domain		Metric	Rating	Comments
	Metric 5:	Test Method Suitability	Medium	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Low	Limited details on testing conditions (pH and darkness not reported).
	Metric 7:	Testing Consistency	High	Reported test conditions were consistent.
	Metric 8:	System Type and Design	Medium	Limited detail.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	Microbial viability not validated.
	Metric 10:	Sampling Methods	N/A	This metric is not applicable to this type of study.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	There was incomplete reporting of outcome assessment methods.
	Metric 12:	Test Substance Purity	Medium	Limited details reported, sampling times generally reported (weekly, routinely).
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Uncertainties in analytical methods were generally noted.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric is not applicable to this type of study.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Analytical detail minimal, extraction efficiency, percent recovery, or mass balance were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric is not applicable to this type of study.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information, evaluation of the reasonableness of the study results was not possible.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to this type of study.

Overall Quality Determination — Low

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Jackson, MI; inflow of 6.8X10+7 L/day; 1.99% organic matter
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 and CO2 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; weekly
pH Adjusted and pH	Not Reported; 7
Concentration	25 - 200 µg C/mL
Composition and Test Temperature	phosphate buffer, KH2PO4 and K2HPO4 (adjusted to pH 7.0); mineral salts, NH4CI, CaCl2.2H2O, MgCl.6H2O, and FeCl2.4H2O; and trace metals, MnCl2.4H2O, H3BO3, ZnCl2, CuCl2, NaMo4.2H20, CoCl2.6H20, NiCl2.6H20, and Na2SeO3.; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	UniMeasure pressure transducer; % of theoretical gas production at concentrations of 25; 50; 100; 200 ug C/mL; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	105%; 104%; 109%; 100%; ±4.8%; ±18.7%; ±3.7%; ±1.5%; Not reported; Not Reported
Results Remarks and Results Details	There was no significant effect of substrate concentration on lag times or extent of degradation.; Degradation is expressed as percentage of theoretical gas production based on the stoichiometry of mineralization to CH4 + CO2 and correcting for gas solubilities.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	High	A concurrent control was included.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

Domain	Metric		EVALUATION Rating	Comments
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product(s) concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Determination		**High**	

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Jackson, MI; inflow of 6.8X10+7 L/day; 1.99% organic matter
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 and CO2 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; weekly
pH Adjusted and pH	Not Reported; 7
Concentration	Not Reported
Composition and Test Temperature	Revised anaerobic mineral medium (RAMM); ASTM medium; Supplemental medium; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	UniMeasure pressure transducer; % of theoretical gas production using RAMM; ASTM; Supplemental medium; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	130%; 156%; 85%; ±5.0%; ±0%;±7.7%; Not reported; Not Reported
Results Remarks and Results Details	ASTM medium overpressures were a result of abiological fluxes of CO2 into the headspace from the buffer (30% CO2-HCO3- system).; Degradation is expressed as percentage of theoretical gas production based on the stoichiometry of mineralization to CH4 + CO2 and correcting for gas solubilities.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

			EVALUATION Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Holt, MI; 0.89% organic matter; average retention time 39 days
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 and CO2 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; weekly
pH Adjusted and pH	Not Reported; 7
Concentration	Not Reported
Composition and Test Temperature	Revised anaerobic mineral medium (RAMM); ASTM medium; Supplemental medium; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	UniMeasure pressure transducer; % of theoretical gas production using RAMM; ASTM; Supplemental medium; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	112%; 145%; 96%; ±13.7%; ±19.0%; ±2.9%; Not reported; Not Reported
Results Remarks and Results Details	ASTM medium overpressures were a result of abiological fluxes of CO2 into the headspace from the buffer (30% CO2-HCO3- system).; Degradation is expressed as percentage of theoretical gas production based on the stoichiometry of mineralization to CH4 + CO2 and correcting for gas solubilities.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Ionia, MI; average retention time 17 days
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 and CO2 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; weekly
pH Adjusted and pH	Not Reported; 7
Concentration	Not Reported
Composition and Test Temperature	Revised anaerobic mineral medium (RAMM); ASTM medium; Supplemental medium; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	UniMeasure pressure transducer; % of theoretical gas production using RAMM; ASTM; Supplemental medium; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	118%; 183%; 104%; ±11.4%; ±9.5%; ±24.8%; Not reported; Not Reported
Results Remarks and Results Details	ASTM medium overpressures were a result of abiological fluxes of CO2 into the headspace from the buffer (30% CO2-HCO3- system).; Degradation is expressed as percentage of theoretical gas production based on the stoichiometry of mineralization to CH4 + CO2 and correcting for gas solubilities.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	High	A concurrent control was included.
Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Adrian, MI
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; Not reported
pH Adjusted and pH	Not Reported; 7
Concentration	50 µg C/mL
Composition and Test Temperature	phosphate buffer, KH2PO4 and K2HPO4 (adjusted to pH 7.0); mineral salts, NH4CI, CaCl2.2H2O, MgCl.6H2O, and FeCl2.4H2O; and trace metals, MnCl2.4H2O, H3BO3, ZnCl2, CuCl2, NaMo4.2H20, CoCl2.6H20, NiCl2.6H20, and Na2SeO3.; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-FID; % of theoretical methane production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	88%; Not reported; 8 weeks; Not Reported
Results Remarks and Results Details	Not Reported; Net methane production was calculated by subtracting background methane production in unamended bottles from that in test bottles.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Jackson, MI; inflow of 6.8X10+7 L/day; 1.99% organic matter
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; Not reported
pH Adjusted and pH	Not Reported; 7
Concentration	50 µg C/mL
Composition and Test Temperature	phosphate buffer, KH2PO4 and K2HPO4 (adjusted to pH 7.0); mineral salts, NH4CI, CaCl2.2H2O, MgCl.6H2O, and FeCl2.4H2O; and trace metals, MnCl2.4H2O, H3BO3, ZnCl2, CuCl2, NaMo4.2H20, CoCl2.6H20, NiCl2.6H20, and Na2SeO3.; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-FID; % of theoretical methane production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	80%; Not reported; 8 weeks; Not Reported
Results Remarks and Results Details	Not Reported; Net methane production was calculated by subtracting background methane production in unamended bottles from that in test bottles.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Ann Arbor, MI
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; Not reported
pH Adjusted and pH	Not Reported; 7
Concentration	50 µg C/mL
Composition and Test Temperature	phosphate buffer, KH2PO4 and K2HPO4 (adjusted to pH 7.0); mineral salts, NH4CI, CaCl2.2H2O, MgCl.6H2O, and FeCl2.4H2O; and trace metals, MnCl2.4H2O, H3BO3, ZnCl2, CuCl2, NaMo4.2H20, CoCl2.6H20, NiCl2.6H20, and Na2SeO3.; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-FID; % of theoretical methane production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	132%; Not reported; 8 weeks; Not Reported
Results Remarks and Results Details	Not Reported; Net methane production was calculated by subtracting background methane production in unamended bottles from that in test bottles.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: St Johns, MI
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; Not reported
pH Adjusted and pH	Not Reported; 7
Concentration	50 µg C/mL
Composition and Test Temperature	phosphate buffer, KH2PO4 and K2HPO4 (adjusted to pH 7.0); mineral salts, NH4CI, CaCl2.2H2O, MgCl.6H2O, and FeCl2.4H2O; and trace metals, MnCl2.4H2O, H3BO3, ZnCl2, CuCl2, NaMo4.2H20, CoCl2.6H20, NiCl2.6H20, and Na2SeO3.; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-FID; % of theoretical methane production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	113%; Not reported; 8 weeks; Not Reported
Results Remarks and Results Details	Not Reported; Net methane production was calculated by subtracting background methane production in unamended bottles from that in test bottles.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Ionia, MI; average retention time 17 days
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; Not reported
pH Adjusted and pH	Not Reported; 7
Concentration	50 µg C/mL
Composition and Test Temperature	phosphate buffer, KH2PO4 and K2HPO4 (adjusted to pH 7.0); mineral salts, NH4CI, CaCl2.2H2O, MgCl.6H2O, and FeCl2.4H2O; and trace metals, MnCl2.4H2O, H3BO3, ZnCl2, CuCl2, NaMo4.2H20, CoCl2.6H20, NiCl2.6H20, and Na2SeO3.; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-FID; % of theoretical methane production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	73%; Not reported; 8 weeks; Not Reported
Results Remarks and Results Details	Not Reported; Net methane production was calculated by subtracting background methane production in unamended bottles from that in test bottles.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

			EVALUATION Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Holt, MI; 0.89% organic matter; average retention time 39 days
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; Not reported
pH Adjusted and pH	Not Reported; 7
Concentration	50 µg C/mL
Composition and Test Temperature	phosphate buffer, KH2PO4 and K2HPO4 (adjusted to pH 7.0); mineral salts, NH4CI, CaCl2.2H2O, MgCl.6H2O, and FeCl2.4H2O; and trace metals, MnCl2.4H2O, H3BO3, ZnCl2, CuCl2, NaMo4.2H20, CoCl2.6H20, NiCl2.6H20, and Na2SeO3.; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-FID; % of theoretical methane production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	86%; Not reported; 8 weeks; Not Reported
Results Remarks and Results Details	Not Reported; Net methane production was calculated by subtracting background methane production in unamended bottles from that in test bottles.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

			EVALUATION Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Mason, MI
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; Not reported
pH Adjusted and pH	Not Reported; 7
Concentration	50 µg C/mL
Composition and Test Temperature	phosphate buffer, KH2PO4 and K2HPO4 (adjusted to pH 7.0); mineral salts, NH4CI, CaCl2.2H2O, MgCl.6H2O, and FeCl2.4H2O; and trace metals, MnCl2.4H2O, H3BO3, ZnCl2, CuCl2, NaMo4.2H20, CoCl2.6H20, NiCl2.6H20, and Na2SeO3.; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-FID; % of theoretical methane production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	96%; Not reported; 8 weeks; Not Reported
Results Remarks and Results Details	Not Reported; Net methane production was calculated by subtracting background methane production in unamended bottles from that in test bottles.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Chelsea, MI; Inflow 1.6X10+6 liters/day.
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; Not reported
pH Adjusted and pH	Not Reported; 7
Concentration	50 µg C/mL
Composition and Test Temperature	phosphate buffer, KH2PO4 and K2HPO4 (adjusted to pH 7.0); mineral salts, NH4CI, CaCl2.2H2O, MgCl.6H2O, and FeCl2.4H2O; and trace metals, MnCl2.4H2O, H3BO3, ZnCl2, CuCl2, NaMo4.2H20, CoCl2.6H20, NiCl2.6H20, and Na2SeO3.; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-FID; % of theoretical methane production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	60%; Not reported; 8 weeks; Not Reported
Results Remarks and Results Details	Not Reported; Net methane production was calculated by subtracting background methane production in unamended bottles from that in test bottles.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Anaerobic degradation in digester sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Unamended bottles.; Not reported
Oxygen and Inoculum	anaerobic; anaerobic sludge: Portland, MI
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 evolution: digested sewage sludge diluted to 10% and incubated anaerobically in 160-ml serum bottles with 50 ug of C/mL of test chemical.; Not reported
pH Adjusted and pH	Not Reported; 7
Concentration	50 µg C/mL
Composition and Test Temperature	phosphate buffer, KH2PO4 and K2HPO4 (adjusted to pH 7.0); mineral salts, NH4CI, CaCl2.2H2O, MgCl.6H2O, and FeCl2.4H2O; and trace metals, MnCl2.4H2O, H3BO3, ZnCl2, CuCl2, NaMo4.2H20, CoCl2.6H20, NiCl2.6H20, and Na2SeO3.; 35°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; 10% CO2/90% N2 headspace
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-FID; % of theoretical methane production; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	96%; Not reported; 8 weeks; Not Reported
Results Remarks and Results Details	Not Reported; Net methane production was calculated by subtracting background methane production in unamended bottles from that in test bottles.
Results Mean Total Recovery and Results per Recovery	Not reported; Not reported

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A concurrent control was included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Shelton, D. R., Tiedje, J. M. (1984). General method for determining anaerobic biodegradation potential. Applied and Environmental Microbiology 47(4):850-857.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	2215626

		EVALUATION	
Domain	Metric	Rating	Comments
Domain 3: Test Conditions			
Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms			
Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment			
Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control			
Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis			
Metric 15:	Data Reporting	Medium	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other			
Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

* Related References: Same as HERO ID 2215626.

Study Citation:	Tang, Y., Zhang, Y., Jiang, L., Yang, C., Rittmann, B. E. (2017). Enhanced dimethyl phthalate biodegradation by accelerating phthalic acid di-oxygenation. Biodegradation 28(5-6):413-421.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	4175087

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; other; experimental; other: Not reported; batch biodegradation experiments in internal circulation baffled bioreactor
Solvent, Reactivity, Storage, Stability	Pure water, stock solution 1000 mg/L; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Shanghai Sinopharm Chemical Reagent Co. Ltd., China; NR; analytical purity Notes: NR
Blank and Control	Not reported; Not reported
Oxygen and Inoculum	not specified; activated sludge, domestic, adapted: Primary activated sludge from secondary clarifier of Changqiao municipal wastewater treatment plant, Shanghai, China; acclimated to dimethyl phthalate feed after 2 weeks.
Duration, Parameter, System, and Sampling Frequency	2 days; test mat.: Internal circulation baffled bioreactor (top section 220 mL, bottom section 510 mL), liquid medium pumped between upper aerated section and lower biodegradation section at rate of 480 L/h. Biofilm formation occurred on ceramic plates in bottom section.; 0, 0.5, 1, 1.5, and 2 hours
pH Adjusted and pH	Not Reported; Not reported
Concentration	0.3 - 0.6 mmol/L
Composition and Test Temperature	Trace element solution: 1.5 g FeCl2·4H2O, 0.024 g NiCl2·6H2O, 0.19 g CoCl2·6H2O, 0.002 g CuCl2·2H2O, 0.1 g MnSO4·7H2O, 0.024 g Na2MoO4·2H2O, 0.07 g ZnCl2, and 0.006 g H3BO; nutrient solution 19.1 g NH4Cl and 4.39 g KH2PO4 in 1 L water.; 37°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Not reported
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	HPLC-DAD, analytes separated on Zorbax SB-C18 column; Liquid samples filtered prior to measurement; Test substance disappearance; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	Approx. 100% (low concentration), 86% (high concentration); NR; 2 days; NR
Results Remarks and Results Details	Results reported for starting concentrations of 0.3 mM and 0.6 mM.; Low concentration 0.2-order kinetics biodegradation rate constant=0.27 (R^2=0.998) High concentration 0.2-order kinetics biodegradation rate constant=0.33 (R^2=0.999)
Results Mean Total Recovery and Results per Recovery	NR; NR

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	High	The test substance source and qualitative purity were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Controls were not explicitly included.

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Study Citation:	Tang, Y., Zhang, Y., Jiang, L., Yang, C., Rittmann, B. E. (2017). Enhanced dimethyl phthalate biodegradation by accelerating phthalic acid di-oxygenation. Biodegradation 28(5-6):413-421.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	4175087

		EVALUATION		
Domain		Metric	Rating	Comments
	Metric 4:	Test Substance Stability	Medium	Test substance preparation but not storage conditions were reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Some testing conditions (oxygen, pH) were omitted.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups.
	Metric 8:	System Type and Design	N/A	Not applicable.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is used for similar study types.
	Metric 10:	Sampling Methods	N/A	Not applicable.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining biodegradation rates.
	Metric 12:	Test Substance Purity	High	Sampling methods were appropriate and samples were collected at an acceptable frequency.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	The inoculum was acclimated to dimethyl phthalate prior to study start, which is non-standard from accepted biodegradation protocols.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	Not applicable.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The analytical method was appropriate. Limits of detection were not reported. Results were reported only graphically, and were estimated by the reviewer.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were described and applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable based on the method but the test system and acclimated inoculum may be non-standard from accepted protocols. The study focused on optimizing dimethyl phthalate biodegradation and did not compare the results to previous studies.
	Metric 18:	QSAR Models	N/A	Not applicable.

Overall Quality Determination — High

Study Citation:	Taylor, B. F., Curry, R. W., Corcoran, E. F. (1981). Potential for biodegradation of phthalic Acid esters in marine regions. Applied and Environmental Microbiology 42(4):590-595.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	789301

EXTRACTION

Parameter	Data
CASRN and Test Material	Not Reported; Not Reported
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; Aldrich Chemical Co (Milwaukee, WI); NR; 99% pure
Blank and Control	Not applicable; Not applicable
Oxygen and Inoculum	aerobic; other:: gram-negative bacteria isolated on DMP (DMP 1-1); gram-negative bacteria isolated on DEP (DEP 4-1); gram positive bacteria isolated on DEHP (DEHP 4-1)
Duration, Parameter, System, and Sampling Frequency	Not reported; O2 consumption: Warburg apparatus; 1-2 hours after tipping the substrate
pH Adjusted and pH	Not reported; Not reported
Concentration	0.05 % (wt/vol)
Composition and Test Temperature	NaCl; MgSO4.7H20; KCl; 30Â°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not reported; Cultures were incubated with rotary shaking (200 rpm).
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC-ECD; Not Reported; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	Not Reported; Not reported; 1-2 hours after tipping the substrate; Not Reported
Results Remarks and Results Details	O2 consumption (uL/h): 185 (DMP 1-1); 8 (DEP 4-1); 0 (DEHP 4-1); Not Reported
Results Mean Total Recovery and Results per Recovery	92% or better; Not Reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified by name
Metric 2:	Test Substance Purity	High	The source or purity of the test substance were reported.
Domain 2: Test Design			
Metric 3:	Study Controls	Uninformative	The study did not include control groups that consequently make the study unusable.
Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Taylor, B. F., Curry, R. W., Corcoran, E. F. (1981). Potential for biodegradation of phthalic Acid esters in marine regions. Applied and Environmental Microbiology 42(4):590-595.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	789301

Domain	Metric	EVALUATION Rating	Comments
Domain 3: Test Conditions			
Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
Metric 6:	Testing Conditions	High	Some testing conditions were not reported, but are not likely to have substantial impact on the results.
Metric 7:	Testing Consistency	High	The test conditions were consistent.
Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms			
Metric 9:	Outcome Assessment Methodology	High	The test organism information or inoculum source were reported.
Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment			
Metric 11:	Test Substance Identity	Medium	There were minor omissions, including biodegradation rate. Bacterial isolates with potential to degrade the test substance were reported, and some biodegradation products were reported.
Metric 12:	Test Substance Purity	High	Sampling methods were appropriate.
Domain 6: Confounding/Variable Control			
Metric 13:	Confounding Variables	High	No confounding variables were noted.
Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis			
Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other			
Metric 17:	Verification or Plausibility of Results	High	The study results were reasonable.
Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — Uninformative

Study Citation:	Ejlertsson, J., Johansson, E., Karlsson, A., Meyerson, U., Svensson, B. H. (1996). Anaerobic degradation of xenobiotics by organisms form municipal solid waste under landfilling conditions. Antonie van Leeuwenhoek 69(1):67-74.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1315944

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: municipal solid waste anaerobic microflora
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	No; Merck; NR; NR
Oxygen and Inoculum	anaerobic; anaerobic microorganisms
Duration, Parameter, System, and Sampling Frequency	100 days; test mat.; Experimental bottles (118 ml); every 10 days
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	0, 3, 9, and 10, followed by 10 day intervals; liquid sampled; Milled Municipal Sewage Waste with a particle size of approximately 1 cm; aqueous phosphate buffer; Not reported; mineral medium=pH 7
Control Dark, Control, and Blank	Not reported; Not reported; Yes, check for methane production from waste
Concentration	50 mgC/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC for methane and HPLC for test substance detection; Not Reported; 1
Results Remarks	Phthalic acid was completely degraded to methane and carbon dioxide after a lag phase of approximately 65 days.
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	100% degradation after 100 days.; Not reported; Not reported; Not reported
Results Details	Not reported
Mean Total Recovery Results and Results Per Recovery	Not reported; Not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	76%; Not Reported; methane and carbon dioxide

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified by chemical name.
Metric 2:	Test Substance Purity	High	The test substance source was reported.
Domain 2: Test Design			
Metric 3:	Study Controls	High	Use of a control group was reported.
Metric 4:	Test Substance Stability	Medium	Loss due to abiotic processes and/or adsorption were not controlled.
Domain 3: Test Conditions			

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Study Citation:	Ejlertsson, J., Johansson, E., Karlsson, A., Meyerson, U., Svensson, B. H. (1996). Anaerobic degradation of xenobiotics by organisms form municipal solid waste under landfilling conditions. Antonie van Leeuwenhoek 69(1):67-74.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1315944

Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	Medium	Some details were omitted.
	Metric 6:	Testing Conditions	High	Test conditions were consistent across samples or study groups.
	Metric 7:	Testing Consistency	High	No inconsistencies were reported or identified.
	Metric 8:	System Type and Design	High	The system type was appropriate.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The test organism source was reported and appropriate for the study type.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used accepted methods for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	All reported variability or uncertainty was not likely to influence the outcome assessment.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Extraction efficiency and recovery were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical and kinetic calculations were not described in detail.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results were reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Liu, S. M., Chi, W. C. (2003). CO(2)-H(2)-dependent anaerobic biotransformation of phthalic acid isomers in sediment slurries. Chemosphere 52(6):951-958.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	6816041

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Ortho-phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	Prepared in 0.1 M NaOH; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR
Oxygen and Inoculum	anaerobic; natural water / sediment: freshwater: Top 0 - 5 cm sediment form Keelung River, Yuanshan, Taipei
Duration, Parameter, System, and Sampling Frequency	Not reported; test mat.; 100 mL serum vials sealed with butyl rubber stoppers and aluminum crimp seals, containing 50 mL aliquots of sediment slurry and headspace flushed with CO2 gas; at intervals
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	not specified; Not reported; 10% (w/v) solids slurry natural sediment; natural water; Not reported; 7.82 (water); 7.04 (slurry)
Control Dark, Control, and Blank	yes; Solvent control, 0.1 M NaOH added; Autoclaved at 121°C for 30 min on 3 d
Concentration	20 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	HPLC/UV-Vis, analytes separated on Purospher RP-18 column; Not reported; test mat. analysis
Results Remarks	Complete degradation at 198 days. Lag period of 0 d. Biodegradation may be enhanced by increased acidity.
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	Not reported; Not reported; Not reported; Not reported
Results Details	Max removal rate: 0.31 mg/L/d
Mean Total Recovery Results and Results Per Recovery	Not reported; Not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	100%; Not reported; Not reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified by name.
Metric 2:	Test Substance Purity	Medium	The test substance source was not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	High	Solvent control and sterilized blank were included.
Metric 4:	Test Substance Stability	Medium	Test substance preparation (solvent, starting concentration) was reported, storage was not reported.

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Study Citation:	Liu, S. M., Chi, W. C. (2003). CO(2)-H(2)-dependent anaerobic biotransformation of phthalic acid isomers in sediment slurries. Chemosphere 52(6):951-958.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	6816041

		EVALUATION	
Domain	Metric	Rating	Comments
Domain 3: Test Conditions			
Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the deviations and omissions were not likely to have a substantial impact on study results.
Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
Metric 8:	System Type and Design	N/A	This metric is not applicable to the study type.
Domain 4: Test Organisms			
Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and routinely used for similar study types and appropriate for the study method or route.
Metric 10:	Sampling Methods	N/A	This metric is not applicable to the study type.
Domain 5: Outcome Assessment			
Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome(s) of interest.
Metric 12:	Test Substance Purity	Medium	Sample media was not specified, sample preparation or extraction methods were not reported. Sample frequency was not reported.
Domain 6: Confounding/Variable Control			
Metric 13:	Confounding Variables	Medium	Some methodology details were not reported. Only time for full degradation reported, no other data points.
Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis			
Metric 15:	Data Reporting	Low	The analytical method was appropriate; limits of detection or extraction efficiency were not reported. Raw data was not reported. Only one sample point reported.
Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical analysis or kinetic calculations were not applied.
Domain 8: Other			
Metric 17:	Verification or Plausibility of Results	Low	The results were reasonable based on the method, but only time for full degradation was reported. Many methodology details were omitted. Overall trends were comparable to degradation in sludge.
Metric 18:	QSAR Models	N/A	This metric is not applicable to the study type.

Overall Quality Determination — High

Study Citation:	Liu, S. M., Chi, W. C. (2003). CO(2)-H(2)-dependent anaerobic biotransformation of phthalic acid isomers in sediment slurries. Chemosphere 52(6):951-958.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	6816041

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Ortho-phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	Prepared in 0.1 M NaOH; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR
Oxygen and Inoculum	anaerobic; natural water / sediment: freshwater: Top 0 - 5 cm sediment form Keelung River, Yuanshan, Taipei
Duration, Parameter, System, and Sampling Frequency	Not reported; test mat.; 100 mL serum vials sealed with butyl rubber stoppers and aluminum crimp seals, containing 50 mL aliquots of sediment slurry and headspace flushed with CO2/H2 (4:1 v/v) gas; at intervals
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	not specified; Not reported; 10% (w/v) solids slurry natural sediment; natural water; Not reported; 7.82 (water); 7.04 (slurry)
Control Dark, Control, and Blank	yes; Solvent control, 0.1 M NaOH added; Autoclaved at 121°C for 30 min on 3 d
Concentration	20 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	HPLC/UV-Vis, analytes separated on Purospher RP-18 column; Not reported; test mat. analysis
Results Remarks	Complete degradation at 180 days. Lag period of 0 d. Biodegradation may be enhanced by high initial levels of H2. May also be enhanced by increased acidity. Methanogens nor sulfate-reducing bacteria directly involved in biodegradation under current conditions.
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	Not reported; Not reported; Not reported; Not reported
Results Details	Max removal rate: 3.33 mg/L/d
Mean Total Recovery Results and Results Per Recovery	Not reported; Not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	100%; Not reported; Not reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified by name.
Metric 2:	Test Substance Purity	Medium	The test substance source was not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	High	Solvent control and sterilized blank were included.
Metric 4:	Test Substance Stability	Medium	Test substance preparation (solvent, starting concentration) was reported, storage was not reported.
Domain 3: Test Conditions			

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Study Citation:	Liu, S. M., Chi, W. C. (2003). CO(2)-H(2)-dependent anaerobic biotransformation of phthalic acid isomers in sediment slurries. Chemosphere 52(6):951-958.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	6816041

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the deviations and omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
	Metric 8:	System Type and Design	N/A	This metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	This metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome(s) of interest.
	Metric 12:	Test Substance Purity	Medium	Sample media was not specified, sample preparation or extraction methods were not reported. Sample frequency was not reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Some methodology details were not reported. Only time for full degradation reported, no other data points.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	The analytical method was appropriate; limits of detection or extraction efficiency were not reported. Raw data was not reported. Only one sample point reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical analysis or kinetic calculations were not applied.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	The results were reasonable based on the method, but only time for full degradation was reported. Many methodology details were omitted. Overall trends were comparable to degradation in sludge.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to the study type.

Overall Quality Determination NEED TO FIX

Study Citation:	Liu, S. M., Chi, W. C. (2003). CO(2)-H(2)-dependent anaerobic biotransformation of phthalic acid isomers in sediment slurries. Chemosphere 52(6):951-958.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	6816041

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Ortho-phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	Prepared in 0.1 M NaOH; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR
Oxygen and Inoculum	anaerobic; natural water / sediment: freshwater: Top 0 - 5 cm sediment form Keelung River, Yuanshan, Taipei
Duration, Parameter, System, and Sampling Frequency	Not reported; test mat.; 100 mL serum vials sealed with butyl rubber stoppers and aluminum crimp seals, containing 50 mL aliquots of sediment slurry and headspace flushed with N2 gas; at intervals
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	not specified; Not reported; 10% (w/v) solids slurry natural sediment; natural water; Not reported; 7.82 (water); 8.11 (slurry)
Control Dark, Control, and Blank	yes; Solvent control, 0.1 M NaOH added; Autoclaved at 121°C for 30 min on 3 d
Concentration	20 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	HPLC/UV-Vis, analytes separated on Purospher RP-18 column; Not reported; test mat. analysis
Results Remarks	Complete degradation at 300 days. Lag period of 20 d.
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	Not reported; Not reported; Not reported; Not reported
Results Details	Max removal rate: 0.57 mg/L/d
Mean Total Recovery Results and Results Per Recovery	Not reported; Not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	100%; Not reported; Not reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
	Metric 1: Test Substance Identity	High	The test substance was identified by name.
	Metric 2: Test Substance Purity	Medium	The test substance source was not reported.
Domain 2: Test Design			
	Metric 3: Study Controls	High	Solvent control and sterilized blank were included.
	Metric 4: Test Substance Stability	Medium	Test substance preparation (solvent, starting concentration) was reported, storage was not reported.
Domain 3: Test Conditions			
	Metric 5: Test Method Suitability	High	The test method was suitable for the test substance.

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Study Citation:	Liu, S. M., Chi, W. C. (2003). CO(2)-H(2)-dependent anaerobic biotransformation of phthalic acid isomers in sediment slurries. Chemosphere 52(6):951-958.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	6816041

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the deviations and omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
	Metric 8:	System Type and Design	N/A	This metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	This metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome(s) of interest.
	Metric 12:	Test Substance Purity	Medium	Sample media was not specified, sample preparation or extraction methods were not reported. Sample frequency was not reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Some methodology details were not reported. Only time for full degradation reported, no other data points.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	The analytical method was appropriate; limits of detection or extraction efficiency were not reported. Raw data was not reported. Only one sample point reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical analysis or kinetic calculations were not applied.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	The results were reasonable based on the method, but only time for full degradation was reported. Many methodology details were omitted. Overall trends were comparable to degradation in sludge.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to the study type.

Overall Quality Determination — High

Study Citation:	Liu, S. M., Chi, W. C. (2003). CO(2)-H(2)-dependent anaerobic biotransformation of phthalic acid isomers in sediment slurries. Chemosphere 52(6):951-958.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	6816041

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Ortho-phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	Prepared in 0.1 M NaOH; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR
Oxygen and Inoculum	anaerobic; natural water / sediment: freshwater: Top 0 - 5 cm sediment form Keelung River, Yuanshan, Taipei
Duration, Parameter, System, and Sampling Frequency	Not reported; test mat.; 100 mL serum vials sealed with butyl rubber stoppers and aluminum crimp seals, containing 50 mL aliquots of sediment slurry and headspace flushed with N2/H2 (19:1 v/v) gas; at intervals
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	not specified; Not reported; 10% (w/v) solids slurry natural sediment; natural water; Not reported; 7.82 (water); 8.11 (slurry)
Control Dark, Control, and Blank	yes; Solvent control, 0.1 M NaOH added; Autoclaved at 121°C for 30 min on 3 d
Concentration	20 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	HPLC/UV-Vis, analytes separated on Purospher RP-18 column; Not reported; test mat. analysis
Results Remarks	Complete degradation at 278 days. Lag period of 0 d. Biodegradation may be enhanced by high initial levels of H2.
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	Not reported; Not reported; Not reported; Not reported
Results Details	Max removal rate: 3.75 mg/L/d
Mean Total Recovery Results and Results Per Recovery	Not reported; Not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	100%; Not reported; Not reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
	Metric 1: Test Substance Identity	High	The test substance was identified by name.
	Metric 2: Test Substance Purity	Medium	The test substance source was not reported.
Domain 2: Test Design			
	Metric 3: Study Controls	High	Solvent control and sterilized blank were included.
	Metric 4: Test Substance Stability	Medium	Test substance preparation (solvent, starting concentration) was reported, storage was not reported.
Domain 3: Test Conditions			
	Metric 5: Test Method Suitability	High	The test method was suitable for the test substance.

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Study Citation:	Liu, S. M., Chi, W. C. (2003). CO(2)-H(2)-dependent anaerobic biotransformation of phthalic acid isomers in sediment slurries. Chemosphere 52(6):951-958.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	6816041

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the deviations and omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
	Metric 8:	System Type and Design	N/A	This metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	This metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome(s) of interest.
	Metric 12:	Test Substance Purity	Medium	Sample media was not specified, sample preparation or extraction methods were not reported. Sample frequency was not reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Some methodology details were not reported. Only time for full degradation reported, no other data points.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	The analytical method was appropriate; limits of detection or extraction efficiency were not reported. Raw data was not reported. Only one sample point reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical analysis or kinetic calculations were not applied.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	The results were reasonable based on the method, but only time for full degradation was reported. Many methodology details were omitted. Overall trends were comparable to degradation in sludge.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to the study type.

Overall Quality Determination — High

Study Citation:	Liu, S. M., Lin, Y. L., Tsai, T. L. (2005). Growth dynamics of major microbial populations during biodegradation of o-phthalate in anaerobic sediment slurries under a CO2/H2 atmosphere. Chemosphere 59(1):91-98.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	6816044

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; o-phthalate
Confidentiality, EndPoint, Type, Guideline	none; other; experimental; other: not reported
Solvent, Reactivity, Storage, Stability	10 g/L in acetonitrile; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR
Oxygen and Inoculum	other; natural water / sediment: freshwater: Sediment and overlying water collected from Keelung River in Dajadwan, Taipei
Duration, Parameter, System, and Sampling Frequency	220 d (from figure); test mat.; Room temperature. 100 mL serum vials sealed with butyl rubber stoppers and aluminum crimp seals, headspace flushed with 4:1 CO2:H2; Reported graphically
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	52 d (low concentration) 44 d (high concentration); Aqueous; 0 - 5 cm top sediment; Overlying site water; Not reported; 7.4 (water)
Control Dark, Control, and Blank	yes; Not reported; NR; solvent control included
Concentration	9.4 - 21.4 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	HPLC-UV Vis, analytes separated on Spherex 10 C18 column; detection limit 0.07 mg/L; Aqueous samples vortexed with acetonitrile, centrifuged, supernatant removed and filtered for analysis; detection limit=0.07 mg/L; test mat. analysis
Results Remarks	14-day lag period observed at lower concentration. No lag period observed at higher concentration.
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	NR; NR; NR; NR
Results Details	Low conc: Approx. 0%/0d, -6%/5d, 0%/14d, 4%/16d, 15%/21d, 20%/28d, 31%/35d, 57%/42d, 68%/45d, 86%/52d, 86%/55d (from figure)
Mean Total Recovery Results and Results Per Recovery	90%; NR
Results Value, Direct Quantum Yield Results, and Transformation Products	86% (low conc.), 82.7% (high conc.); NR; NR

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by accepted synonym.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Solvent controls were included, sterile controls were not explicitly included. The results were not reported.
	Metric 4:	Test Substance Stability	Medium	Test substance preparation (solvent, starting concentrations) were reported, but storage was omitted.

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Study Citation:	Liu, S. M., Lin, Y. L., Tsai, T. L. (2005). Growth dynamics of major microbial populations during biodegradation of o-phthalate in anaerobic sediment slurries under a CO2/H2 atmosphere. Chemosphere 59(1):91-98.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	6816044

		EVALUATION		
Domain	Metric		Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Appropriate testing conditions were reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
	Metric 8:	System Type and Design	N/A	Not applicable.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is used for similar studies.
	Metric 10:	Sampling Methods	N/A	Not applicable.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining biodegradation.
	Metric 12:	Test Substance Purity	High	Sampling methods and sample collection frequency were appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	No notable sources of uncertainty were identified.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	Not applicable.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The analytical method was appropriate; detection limits and recovery were reported. Final degradation was reported, but degradation kinetics were estimated by the reviewer from figures.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical or kinetic calculations were not conducted.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable based on the method, but degradation kinetics were estimated from figures by the reviewer. The general trends and bacterial population types were supported by previous literature, but rates were not compared.
	Metric 18:	QSAR Models	N/A	Not applicable.

Overall Quality Determination — High

Study Citation:	Michigan State University, (1981). Final report to battelle columbus laboratories and EPA-OTS, subcontract no. T-6419 (7197)-033, 100179 - 093081. Development of test for determining anaerobic biodegradation potential.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1316233

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic anhydride
Confidentiality, EndPoint, Type, Guideline	None; ready biodegradability; Experimental; other: Biodegradation of phthalic acid in anaerobic sludge from two STPs.
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Oxygen and Inoculum	anaerobic; activated sludge, adapted: Secondary anaerobic sewage sludge from two plants with significant industrial input.
Duration, Parameter, System, and Sampling Frequency	8 weeks; CH4 evolution; Digester bottles with 10% sludge were incubated for 8-10 weeks with 20 ppm of phthalic acid.; Not reported
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	Not reported; Not reported; Not reported; Not reported; Not reported; 7
Control Dark, Control, and Blank	Not Reported; Controls were used.; Not reported
Concentration	20 ppm
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-FID with 2m Tenax-SC column.; Biodegradation was expressed as % theoretical gas production with CH4 and CO2 solubility corrections. LOD was 0.5 ppm.; 1
Results Remarks	Not Reported
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	Not reported; Not reported; Not reported; Not reported
Results Details	Sludge from 10 other treatment plants was tested but the tests were not described in depth. Degradation after 8 weeks ranged from 58-113% in the non-industrial sludge, and 74-132% in the industrial sludge.
Mean Total Recovery Results and Results Per Recovery	Not reported; Not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	% Degradation in Adrian sludge: 99; Jackson sludge: 100.; Not Reported; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified using common nomenclature.
	Metric 2:	Test Substance Purity	Medium	The test substance purity was not reported but the omission is unlikely to have a substantial impact on the study results.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Appropriate blanks were used to measure background levels and correct concentration measurements.

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Study Citation:	Michigan State University, (1981). Final report to battelle columbus laboratories and EPA-OTS, subcontract no. T-6419 (7197)-033, 100179 - 093081. Development of test for determining anaerobic biodegradation potential.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1316233

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 4:	Test Substance Stability	Medium	Some details regarding the test substance preparation were not reported but the omissions are unlikely to have an impact on the study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	The testing conditions were reported and appropriate.
	Metric 7:	Testing Consistency	High	There were no reported changes to the testing conditions across the sample groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum type was described and appropriate.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed the intended outcome of interest.
	Metric 12:	Test Substance Purity	Medium	Some of the sampling details were not reported but the omissions are unlikely to have a substantial impact on the study results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	Uncertainty was not reported in the results but the omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Target chemical concentrations and extraction efficiencies were not reported but the omissions are unlikely to have a substantial impact on the study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Low	Statistical analysis was not reported and data is not available to perform an independent analysis.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results are plausible.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination **High**

* Related References: The data corresponding to this entry is also reported under HERO ID 6320824.

Study Citation:	Ejlertsson, J., Houwen, F. P., Svensson, B. H. (1996). Anaerobic degradation of diethyl phthalate and phthalic acid during incubation of municipal solid waste from a biogas digestor. Swedish Journal of Agricultural Research 26(2):53-59.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1315796

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; other; experimental; other: Biodegradation in municipal solid waste from a biogas reactor
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; MERCK products purchased from KEBO (Stockholm, Sweden); NR; NR Notes: NR
Oxygen, pH, and CEC	anaerobic; NR; NA
Test Type, Test Temperature, and Test Details	laboratory; 37°C; Inoculum collected from two-stage pilot plant digestor treating municipal solid waste, which recirculated the leachate and was fed new waste when methane production leveled off. Inoculum collected after 18 mo. Biogas plant operation.
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	other; Not Reported; NR
Soil Classification, Microbial Biomass, and Humidity	NA; municipal solid waste; NR: NR
Duration, Parameter, System, and Sampling Frequency	100 days; test material; 500 or 250 mL bottles containing mineral medium spiked with test substance (55 - 75 mg/L and 230 mg/L), flushed with 80:20 N2/CO2, with culture fluid of 3 g/L total solids added, closed with butyl rubber stoppers sealed with aluminum screw caps; reported graphically
Control and Blank	Background control: unspiked test system; NR
Concentration	NR 55 - 230 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC (gas samples), spectrophotometry and HPLC (liquid samples); Liquid samples centrifuged prior to analysis; Test substance disappearance
Results Remarks	Methane production leveled off after 50 days for the high concentration, and the low concentration remained roughly level the hole test duration. Methane evolution was 30 - 60% of theoretical total methane production.
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	100%; NR; 30 to 60 days (low concentration), 80 to 100 days (high concentration); NR; NR
Results Details	Lag period of 40 days for high concentrations, no clear lag period observed for low concentrations.
Mean Total Recovery Results and Results Per Recovery	NR; NR

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	Medium	Test material source was reported, purity was not.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Background levels were included; sterilized blanks were not explicitly included.

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Study Citation:	Ejlertsson, J., Houwen, F. P., Svensson, B. H. (1996). Anaerobic degradation of diethyl phthalate and phthalic acid during incubation of municipal solid waste from a biogas digestor. Swedish Journal of Agricultural Research 26(2):53-59.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1315796

		EVALUATION		
Domain		Metric	Rating	Comments
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Most test conditions were reported, some conditions (pH, carbon content) were not included.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The test inoculum was reported and is routinely used for similar study types and is appropriate.
	Metric 10:	Sampling Methods	N/A	This metric does not apply to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported accepted sampling methods for the chemical and media which address the outcomes of interest.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty were accounted for and were not likely to influence the outcome assessment.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric does not apply to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	Target chemical extraction efficiency and transformation products were reported. Sufficient evidence was presented to confirm that the parent compound disappearance was not likely due to processes other than biodegradation.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results were reasonable.
	Metric 18:	QSAR Models	N/A	This metric does not apply to this study type.

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Study Citation:	Ejlertsson, J., Houwen, F. P., Svensson, B. H. (1996). Anaerobic degradation of diethyl phthalate and phthalic acid during incubation of municipal solid waste from a biogas digestor. Swedish Journal of Agricultural Research 26(2):53-59.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1315796

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Determination		**High**	

* Related References: Cited in ECHA

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: In-situ field study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	field trial; 21.1-23°C; NaOH trap for the collection
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 39.3% clay/13.4% silt/47.3% sand/0.9% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 27.8% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; the field biometer frame was driven into the soil horizon to a depth of 10.16 cm. 20 ml of 1.0X10-4 mol/L phthalate acid containing a total activity of3.7X10+4 Bq was applied to the surface.; NR
Control and Blank	NR; NR
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	21.0%; NR; NR; NR; NR
Results Details	test chemicals added directly to a small surface area and quickly infiltrated into the soil. it is highly probable that the applied phthalic acid flowed primarily into macropores, with some diffusion into micropores. Resulting in reduced rates of microbial decomposition compared to other methods.
Mean Total Recovery Results and Results Per Recovery	NR; NR

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EVALUATION

Domain	Metric		Rating	Comments
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	Medium	Equilibrium was not reported but this was not likely to have a substantial impact on study results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability were not reported but their omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EVALUATION

Domain	Metric		Rating	Comments
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination High

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: Soil biometer flask study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	laboratory; 20±1°C; Not Reported
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 9.4% clay/12.8% silt/77.8% sand/3.3% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 17.2% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; Soil passed through a sieve and air dried then added to a biometer flask containing CO2 trap.; daily for days 1-5; every second day thereafter until the completion of the experiment.
Control and Blank	0.385 mol/L NaN3 added as a biological inhibitor; sterile
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	68.2%; NR; 30 days; NR; NR
Results Details	3 methods were studied in this report. The higher percent degradation in this method was believed to be attributed to the soil preparation.
Mean Total Recovery Results and Results Per Recovery	NR; 99.99%

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Some concurrent control group details were not included; however, the lack of data was not likely to have a substantial impact on study results.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	High	The system type and design were capable of appropriately maintaining substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The target chemical percent recovery was reported and analytical methods used were suitable for detection and quantification of the target chemical.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: Soil biometer flask study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	laboratory; 20±1°C; Not Reported
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 12.1% clay/13.9% silt/74.0% sand/1.7% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 15.4% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; Soil passed through a sieve and air dried then added to a biometer flask containing CO2 trap.; daily for days 1-5; every second day thereafter until the completion of the experiment.
Control and Blank	0.385 mol/L NaN3 added as a biological inhibitor; sterile
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	85.3%; NR; 30 days; NR; NR
Results Details	3 methods were studied in this report. The higher percent degradation in this method was believed to be attributed to the soil preparation.
Mean Total Recovery Results and Results Per Recovery	NR; 99.99%

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Some concurrent control group details were not included; however, the lack of data was not likely to have a substantial impact on study results.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	High	The system type and design were capable of appropriately maintaining substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The target chemical percent recovery was reported and analytical methods used were suitable for detection and quantification of the target chemical.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: Soil biometer flask study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	laboratory; 20±1°C; Not Reported
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 39.3% clay/13.4% silt/47.3% sand/0.9% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 27.8% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; Soil passed through a sieve and air dried then added to a biometer flask containing CO2 trap.; daily for days 1-5; every second day thereafter until the completion of the experiment.
Control and Blank	0.385 mol/L NaN3 added as a biological inhibitor; sterile
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	36.1%; NR; 30 days; NR; NR
Results Details	3 methods were studied in this report. The higher percent degradation in this method was believed to be attributed to the soil preparation.
Mean Total Recovery Results and Results Per Recovery	NR; 99.99%

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Some concurrent control group details were not included; however, the lack of data was not likely to have a substantial impact on study results.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	High	The system type and design were capable of appropriately maintaining substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The target chemical percent recovery was reported and analytical methods used were suitable for detection and quantification of the target chemical.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: Soil biometer flask study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	laboratory; 20±1°C; Not Reported
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 16.6% clay/14.8% silt/68.6% sand/1.4% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 25.1% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; Soil passed through a sieve and air dried then added to a biometer flask containing CO2 trap.; daily for days 1-5; every second day thereafter until the completion of the experiment.
Control and Blank	0.385 mol/L NaN3 added as a biological inhibitor; sterile
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	85.3%; NR; 30 days; NR; NR
Results Details	3 methods were studied in this report. The higher percent degradation in this method was believed to be attributed to the soil preparation.
Mean Total Recovery Results and Results Per Recovery	NR; 99.99%

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Some concurrent control group details were not included; however, the lack of data was not likely to have a substantial impact on study results.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

		EVALUATION		
Domain	Metric		Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	High	The system type and design were capable of appropriately maintaining substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The target chemical percent recovery was reported and analytical methods used were suitable for detection and quantification of the target chemical.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: soil column biometer
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	laboratory; 20±1°C; 200 ml of 1.0X10-5 mol/L phthalic acid solution containing a total of 3.7X10+4 Bq was applied to the surface of the Ap1 horizon and allowed to free drain into the subsequent lower horizons.
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 9.4% clay/12.8% silt/77.8% sand/3.3% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 17.2% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; Each mineral column section was packed with 250 g of air-dried soil and the individual sections were stacked vertically; not applicable
Control and Blank	not applicable; not applicable
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	21.1%; NR; NR; NR; NR
Results Details	test chemicals added directly to a small surface area and quickly infiltrated into the soil. it is highly probable that the applied phthalic acid flowed primarily into macropores, with some diffusion into micropores. Resulting in reduced rates of microbial decomposition compared to other methods.
Mean Total Recovery Results and Results Per Recovery	NR; 99.99%

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EVALUATION

Domain	Metric		Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	Medium	Equilibrium was not reported but this was not likely to have a substantial impact on study results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability were not reported but their omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EVALUATION

Domain	Metric	Rating	Comments
Overall Quality Determination		**High**	

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: soil column biometer
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	laboratory; 20±1°C; 200 ml of 1.0X10-5 mol/L phthalic acid solution containing a total of 3.7X10+4 Bq was applied to the surface of the Ap1 horizon and allowed to free drain into the subsequent lower horizons.
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 39.3% clay/13.4% silt/47.3% sand/0.9% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 27.8% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; Each mineral column section was packed with 250 g of air-dried soil and the individual sections were stacked vertically; not applicable
Control and Blank	not applicable; not applicable
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	21.0%; NR; NR; NR; NR
Results Details	test chemicals added directly to a small surface area and quickly infiltrated into the soil. it is highly probable that the applied phthalic acid flowed primarily into macropores, with some diffusion into micropores. Resulting in reduced rates of microbial decomposition compared to other methods.
Mean Total Recovery Results and Results Per Recovery	NR; 99.99%

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	Medium	Equilibrium was not reported but this was not likely to have a substantial impact on study results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability were not reported but their omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EVALUATION

Domain	Metric	Rating	Comments
Overall Quality Determination		**High**	

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: soil column biometer
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	laboratory; 20±1°C; 200 ml of 1.0X10-5 mol/L phthalic acid solution containing a total of 3.7X10+4 Bq was applied to the surface of the Ap1 horizon and allowed to free drain into the subsequent lower horizons.
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 16.6% clay/14.8% silt/68.6% sand/1.4% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 25.1% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; Each mineral column section was packed with 250 g of air-dried soil and the individual sections were stacked vertically; not applicable
Control and Blank	not applicable; not applicable
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	19.2%; NR; NR; NR; NR
Results Details	test chemicals added directly to a small surface area and quickly infiltrated into the soil. it is highly probable that the applied phthalic acid flowed primarily into macropores, with some diffusion into micropores. Resulting in reduced rates of microbial decomposition compared to other methods.
Mean Total Recovery Results and Results Per Recovery	NR; 99.99%

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EVALUATION

Domain	Metric		Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	Medium	Equilibrium was not reported but this was not likely to have a substantial impact on study results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability were not reported but their omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EVALUATION

Domain	Metric	Rating	Comments
Overall Quality Determination		**High**	

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: soil column biometer
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	laboratory; 20±1°C; 200 ml of 1.0X10-5 mol/L phthalic acid solution containing a total of 3.7X10+4 Bq was applied to the surface of the Ap1 horizon and allowed to free drain into the subsequent lower horizons.
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 39.3% clay/13.4% silt/47.3% sand/0.9% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 27.8% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; Each mineral column section was packed with 250 g of air-dried soil and the individual sections were stacked vertically; not applicable
Control and Blank	not applicable; not applicable
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	20.2%; NR; NR; NR; NR
Results Details	test chemicals added directly to a small surface area and quickly infiltrated into the soil. it is highly probable that the applied phthalic acid flowed primarily into macropores, with some diffusion into micropores. Resulting in reduced rates of microbial decomposition compared to other methods.
Mean Total Recovery Results and Results Per Recovery	NR; 99.99%

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	Medium	Equilibrium was not reported but this was not likely to have a substantial impact on study results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability were not reported but their omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EVALUATION

Domain	Metric	Rating	Comments
Overall Quality Determination		**High**	

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: In-situ field study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	field trial; 21.1-23°C; NaOH trap for the collection
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 9.4% clay/12.8% silt/77.8% sand/3.3% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 17.2% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; the field biometer frame was driven into the soil horizon to a depth of 10.16 cm. 20 ml of 1.0X10-4 mol/L phthalate acid containing a total activity of3.7X10+4 Bq was applied to the surface.; NR
Control and Blank	NR; NR
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	20.9%; NR; NR; NR; NR
Results Details	test chemicals added directly to a small surface area and quickly infiltrated into the soil. it is highly probable that the applied phthalic acid flowed primarily into macropores, with some diffusion into micropores. Resulting in reduced rates of microbial decomposition compared to other methods.
Mean Total Recovery Results and Results Per Recovery	NR; NR

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	Medium	Equilibrium was not reported but this was not likely to have a substantial impact on study results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability were not reported but their omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			**High**	

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: In-situ field study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	field trial; 21.1-23°C; NaOH trap for the collection
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 12.1% clay/13.9% silt/74.0% sand/1.7% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 15.4% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; the field biometer frame was driven into the soil horizon to a depth of 10.16 cm. 20 ml of 1.0X10-4 mol/L phthalate acid containing a total activity of3.7X10+4 Bq was applied to the surface.; NR
Control and Blank	NR; NR
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	20.9%; NR; NR; NR; NR
Results Details	test chemicals added directly to a small surface area and quickly infiltrated into the soil. it is highly probable that the applied phthalic acid flowed primarily into macropores, with some diffusion into micropores. Resulting in reduced rates of microbial decomposition compared to other methods.
Mean Total Recovery Results and Results Per Recovery	NR; NR

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	Medium	Equilibrium was not reported but this was not likely to have a substantial impact on study results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability were not reported but their omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			**High**	

Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; screening test; experimental; other: In-situ field study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; Merck (Sweden); NR; NR Notes: Labeled and unlabeled forms were used concurrently
Oxygen, pH, and CEC	aerobic; 4.5; not reported
Test Type, Test Temperature, and Test Details	field trial; 21.1-23°C; NaOH trap for the collection
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	loamy sand; 16.6% clay/14.8% silt/68.6% sand/1.4% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Cecil soil from a 15-yr stand of loblolly pine (Pinus taeda L.) at the Clemson Experimental Forest, Pickens, SC, USA. Ap1 0-4 cm depth layer; Not reported: 25.1% moisture
Duration, Parameter, System, and Sampling Frequency	30 days; CO2 evolution; the field biometer frame was driven into the soil horizon to a depth of 10.16 cm. 20 ml of 1.0X10-4 mol/L phthalate acid containing a total activity of3.7X10+4 Bq was applied to the surface.; NR
Control and Blank	NR; NR
Concentration	NR NR - NR NR NR
Analytical Method, Analytical Details, and Results Per Degredation Parameter	radio-assayed using scintillation counter.; not reported; 14CO2 evolution
Results Remarks	average of 4 samples
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	20.7%; NR; NR; NR; NR
Results Details	test chemicals added directly to a small surface area and quickly infiltrated into the soil. it is highly probable that the applied phthalic acid flowed primarily into macropores, with some diffusion into micropores. Resulting in reduced rates of microbial decomposition compared to other methods.
Mean Total Recovery Results and Results Per Recovery	NR; NR

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.

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Study Citation:	Evans, A., Jr (1998). Biodegradation of C-14-labeled low molecular organic acids using three biometer methods. Journal of Geochemical Exploration 65(1):17-25.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	1929050

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	Medium	Equilibrium was not reported but this was not likely to have a substantial impact on study results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is routinely used for similar study types and appropriate for the study method or route.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed. No notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability were not reported but their omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Ortiz, I., Auria, R., Sigoillot, J. C., Revah, S. (2003). Enhancing phenanthrene biomineralization in a polluted soil using gaseous toluene as a cosubstrate. Environmental Science & Technology 37(4):805-810.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	6816284

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; other; experimental; other: non-guideline
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Sigma-Aldrich; NR; +99% Notes: phthalic acid monopotassium salt
Oxygen, pH, and CEC	aerobic; soil pH 8.2; not reported
Test Type, Test Temperature, and Test Details	laboratory; 30±2°C; not reported
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	sand; 35% clay, 9% silt, 56% sand, 8.9% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	Nonpolluted soil was collected from the UAM-I campus garden.; not reported: 30% (w/w) on the basis of the maximum individual water capacity retention of the soil and the vermiculite.
Duration, Parameter, System, and Sampling Frequency	50 hours; other; stoppered flasks; not reported
Control and Blank	Controls included; Sterile soil
Concentration	1000 mg/kg dry soil
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-TCD; HPLC; CO2 evolution by GC-TCD; PA was extracted in distilled water 1:1 (w/v) and quantified by HPLC.; %CO2 evolution; %residual PA; % biomass and other metabolites
Results Remarks	The results were corrected for endogenous respiration.
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	19.88%; 68.12%; 12.00%; ±4.15%;±0.32%;±4.47%; not reported; not reported; not reported
Results Details	Sc=A exp[-B exp(-Kt)], where Sc is the consumed PA (mg/kg dry soil) or produced CO2 (g/m3); K is the PA consumption rate (h-1) or CO2 production rate (h-1); A is the initial PA concentration (mg/kg dry soil) or finalCO2 concentration (g/m3); t is time (h); and B is the parameter related to the initial conditions (dimensionless).
Mean Total Recovery Results and Results Per Recovery	not reported; not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified.
	Metric 2:	Test Substance Purity	High	Test substance source and purity were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Controls were included

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Study Citation:	Ortiz, I., Auria, R., Sigoillot, J. C., Revah, S. (2003). Enhancing phenanthrene biomineralization in a polluted soil using gaseous toluene as a cosubstrate. Environmental Science & Technology 37(4):805-810.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	6816284

			EVALUATION	
Domain	Metric		Rating	Comments
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable.
	Metric 6:	Testing Conditions	High	Testing conditions were reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	Medium	Equilibrium was not reported.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The test inoculum was reported and is routinely used for similar study types and is appropriate.
	Metric 10:	Sampling Methods	N/A	This metric does not apply to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome(s) of interest.
	Metric 12:	Test Substance Purity	High	The sampling method was appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables were not discussed.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric does not apply to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The analytical method was suitable.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset(s).
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results were reasonable.
	Metric 18:	QSAR Models	N/A	This metric does not apply to this study type.

Overall Quality Determination — High

Study Citation:	Roslev, P., Madsen, P. L., Thyme, J. B., Henriksen, K. (1998). Degradation of phthalate and Di-(2-Ethylhexyl)phthalate by indigenous and inoculated microorganisms in sludge-amended soil. Applied and Environmental Microbiology 64(12):4711-4719.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	683768

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; ready biodegradability; Experimental; other: Non-guideline
Solvent, Reactivity, Storage, Stability	U-14-C ring-labelled PA was dissolved in methanol.; NR; NR; NR
Radiolabel, Source, State, Purity	[U-14-C ring] PA; Merck (Darmstadt, Germany); Sigma Chemical Co. (St. Louis, Mo.); NR; Analytical grade; Radiolabeled was >99%.
Oxygen, pH, and CEC	aerobic; Soil pH: 5.9; not reported
Test Type, Test Temperature, and Test Details	laboratory; 20°C; Soil was amended with dewatered sewage sludge from a municipal wastewater treatment plant (Soil:sludge 58:1 dw/dw). Organic matter content of sludge was 28.5%.
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	sandy loam; 2.5% (wt/wt) organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	not reported; not reported: Soil water capacity was 75% of the field capacity
Duration, Parameter, System, and Sampling Frequency	84 days; CO2 evolution; 55 mL glass vial attached to a 20mL glass scintillation vial for CO2 trapping.; 15 samples were taken between day 0 and day 83
Control and Blank	not reported; autoclaved three times
Concentration	4.1 nmol/g
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-FID; not reported; PA mineralization half-life in initial phase (0-28 days) and late phase (28-84 days)
Results Remarks	Initial rate of metabolism: 731.8 pmol/g (dry weight)/day
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	Initial phase: 2 days; Late phase: 15 days; not reported; not reported; not reported; not reported
Results Details	Best depletion fit was an exponential function for the initial phase and a fractional power function for the late phase.
Mean Total Recovery Results and Results Per Recovery	Not reported; Not reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Appropriate blanks and controls were used.

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Study Citation:	Roslev, P., Madsen, P. L., Thyme, J. B., Henriksen, K. (1998). Degradation of phthalate and Di-(2-Ethylhexyl)phthalate by indigenous and inoculated microorganisms in sludge-amended soil. Applied and Environmental Microbiology 64(12):4711-4719.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	683768

			EVALUATION	
Domain	Metric		Rating	Comments
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and appropriate for the test.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed the intended outcome of interest.
	Metric 12:	Test Substance Purity	Medium	Sampling frequency was reported but some details regarding the sampling methodology were omitted.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	No confounding variables were noted. Uncertainty was not reported in the measurements but the omission is unlikely to have a substantial impact on the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination — High

Study Citation:	Zhao, H., Du, H., Feng, N., Xiang, L.,ei, Li, Y., Li, H.,ui, Cai, Q. Y., Mo, C. (2016). Biodegradation of di-n-butylphthalate and phthalic acid by a novel Providencia sp 2D and its stimulation in a compost-amended soil. Biology and Fertility of Soils 52(1):65-76.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	3352270

EXTRACTION

Parameter	Data
CASRN and Test Material	Not Reported; phthalic acid
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: pure culture amended biodegradation
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; Aladdin Chemistry Co., Ltd. (Shanghai, China); NR; 99.5% Notes: PA
Oxygen, pH, and CEC	anaerobic; soil: 6.67; compost: 8.85; mixture: 7.54; not reported
Test Type, Test Temperature, and Test Details	laboratory; 30±1°C; triplicate samples; % moisture/% organic matter/TOC (g/kg): 38.1/1.5/7.9 for soil; 31.7/68.9/391.7 for compost; 35.4/5.7/21.2 for mixture
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	other; 11.99% clay/52.34% silt/35.67% sand/1.5% organic matter; not reported
Soil Classification, Microbial Biomass, and Humidity	soil amended with compost; Strain 2D: compost samples with mineral salt medium incubated with DBP and PA transferred serially >10 times to enrich culture: 40% water-holding capacity
Duration, Parameter, System, and Sampling Frequency	10 days (from figure); test mat; Soil/compost-amended soil in Erlenmeyer flasks and treated with PA, drip irrigation used to add inoculum; periodically
Control and Blank	not reported; negative control: uninoculated; positive control: aerobic sterile soil/compost
Concentration	25 - 500 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC/MS; detection limit 0.082 mg/L; recovery 92.0-97.4%; % degradation
Results Remarks	half-life (starting concentration): 15.13 h (25 mg/L), 17.11 h (50 mg/L), 24.67 h (100 mg/L), 39.84 h (200 mg/L), 182.41 h (500 mg/L)
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	complete degradation at ≤100 mg/L; 43.5% at 500 mg/L; not reported; 144 hours; non-inoculated soil; not reported
Results Details	degradation rate (k) (starting concentration): 0.0458/h (25 mg/L), 0.0405/h (50 mg/L), 0.0281/h (100 mg/L), 0.0174/h (200 mg/L), 0.0038/h (500 mg/L)
Mean Total Recovery Results and Results Per Recovery	not reported; Not Reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified by name.
Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design			
Metric 3:	Study Controls	High	A concurrent negative control and positive control were included.

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Study Citation:	Zhao, H., Du, H., Feng, N., Xiang, L.,ei, Li, Y., Li, H.,ui, Cai, Q. Y., Mo, C. (2016). Biodegradation of di-n-butylphthalate and phthalic acid by a novel Providencia sp 2D and its stimulation in a compost-amended soil. Biology and Fertility of Soils 52(1):65-76.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	3352270

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the omissions were not likely to have a substantial impact on study results.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	N/A	This metric is not applicable to the study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Low	An inoculum that was pre-adapted to the test substance was used for a biodegradation rate study.
	Metric 10:	Sampling Methods	N/A	This metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome(s) of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome(s) of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	No significant sources of uncertainty were identified.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric is not applicable to the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported; however, these omissions were not likely to have a substantial impact on study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset(s).
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were expected.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to the study type.

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Study Citation:	Zhao, H., Du, H., Feng, N., Xiang, L.,ei, Li, Y., Li, H.,ui, Cai, Q. Y., Mo, C. (2016). Biodegradation of di-n-butylphthalate and phthalic acid by a novel Providencia sp 2D and its stimulation in a compost-amended soil. Biology and Fertility of Soils 52(1):65-76.
OECD Harmonized Template:	Biodegredation in Soil
HERO ID:	3352270

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Determination		**High**	

Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; bioaccumulation: terrestrial; experimental; other: Bioaccumulation Factor (BF) values in plants
Solvent, Reactivity, Storage, Stability	dissolved in ethanol; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; radiolabeled: Amersham; unlabeled: Fisher; NR; unlabeled: Fisher certified grade Notes: radiolabeled: CFA 766 Batch 5, specific activity 60 mCi/mmol
Test Organism and Test Organism Details	wheat (mature); Triticum aestivum L. “Butte”
Lipid Content, Test Temperature, pH, and Depuration Time	Not applicable; day: 29°C; night 21°C; soil pH 6.1; not applicable
Moisture, TOC, and Test Conditions Comments	80% field capacity; humidity varied inversely with temperature from 50-70%.; not applicable; Seeds were planted 4 days after PA application to soil (Norfolk sandy loam: 87% sand, 10% silt, 3% clay, 1.3% organic matter) in 2 gallon containers
Nominal Measured and Time Plateau	application rate/pot: 0.6; 6.0; 60.0; 600.0 ppm; not applicable
Duration, Parameter, and Sampling Frequency	74 days; BF; 74 days
Analytical Method and Analytical Details	liquid scintillation spectrometer (Packard Tri-Carb Model 2405); TLC; Plant samples were homogenized using a hexane-acetone extraction.;
Results Value, Result Type, and Results Standard Deviation	0.0017; 0.002; 0.0001; 0.0057; BF (calculated from table); ±0.0017; ±0.0010; ±0.0001; ±0.0010
Calculation Basis and Basis	General Linear Model; plant uptake data were transformed to log10 because of the logarithmic application rates.; dry weight
Elimination, Metabolites, Kinetic Parameter, and Statistics	not applicable; not applicable; Regressions were done to predict phthalic acid uptake based on original soil application rate.; Extraction efficiencies for phthalic acid from wheat (based on 14C from oxidation measurements) was to be 19.2%.

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Concurrent controls were included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.

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Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups. The conditions of the exposure were documented.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	High	The test species was reported and is routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed and no notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, and there were no differences among the study groups in organism attrition or health outcomes that influenced the outcome assessment.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical extraction efficiency, percent recovery, or mass balance were unclearly reported; however, these omissions were not likely to have a substantial impact on study results
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination High

Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; bioaccumulation: terrestrial; experimental; other: Bioaccumulation Factor (BF) values in plants
Solvent, Reactivity, Storage, Stability	dissolved in ethanol; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; radiolabeled: Amersham; unlabeled: Fisher; NR; unlabeled: certified grade Notes: radiolabeled: CFA 766 Batch 5, specific activity 60 mCi/mmol
Test Organism and Test Organism Details	corn; Zea mays L. “Pioneer 3368A”
Lipid Content, Test Temperature, pH, and Depuration Time	Not applicable; day: 29°C; night 21°C; soil pH 6.1; not applicable
Moisture, TOC, and Test Conditions Comments	80% field capacity; humidity varied inversely with temperature from 50-70%.; not applicable; Seeds were planted 4 days after PA application to soil (Norfolk sandy loam: 87% sand, 10% silt, 3% clay, 1.3% organic matter) in 2 gallon containers
Nominal Measured and Time Plateau	application rate/pot: 0.6; 6.0; 60.0; 600.0 ppm; not applicable
Duration, Parameter, and Sampling Frequency	21 days; BF; 21 days
Analytical Method and Analytical Details	liquid scintillation spectrometer (Packard Tri-Carb Model 2405); TLC; Plant samples were homogenized using a hexane-acetone extraction.;
Results Value, Result Type, and Results Standard Deviation	0.003; 0.009; 0.009; 0.011; BF (calculated from table); ±0.0017; ±0.0018; ±0.0039; ±0.0018
Calculation Basis and Basis	General Linear Model; plant uptake data were transformed to log10 because of the logarithmic application rates.; dry weight
Elimination, Metabolites, Kinetic Parameter, and Statistics	not applicable; not applicable; Regressions were done to predict phthalic acid uptake based on original soil application rate.; Chemical extraction efficiencies averaged 75%. Extraction efficiencies for phthalic acid from corn (based on 14C from oxidation measurements) was 38.1%.

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design			
Metric 3:	Study Controls	High	Concurrent controls were included.
Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions			
Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups. The conditions of the exposure were documented.
Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.

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Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

		EVALUATION		
Domain		Metric	Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	High	The test species was reported and is routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed and no notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, and there were no differences among the study groups in organism attrition or health outcomes that influenced the outcome assessment.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical extraction efficiency, percent recovery, or mass balance were unclearly reported; however, these omissions were not likely to have a substantial impact on study results
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; bioaccumulation: terrestrial; experimental; other: Bioaccumulation Factor (BF) values in plants
Solvent, Reactivity, Storage, Stability	dissolved in ethanol; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; radiolabeled: Amersham; unlabeled: Fisher; NR; unlabeled: certified grade Notes: radiolabeled: CFA 766 Batch 5, specific activity 60 mCi/mmol
Test Organism and Test Organism Details	soybean (mature); Glycine max (L.) Merr.
Lipid Content, Test Temperature, pH, and Depuration Time	Not applicable; day: 29°C; night 21°C; soil pH 6.1; not applicable
Moisture, TOC, and Test Conditions Comments	80% field capacity; humidity varied inversely with temperature from 50-70%.; not applicable; Seeds were planted 4 days after PA application to soil (Norfolk sandy loam: 87% sand, 10% silt, 3% clay, 1.3% organic matter) in 2 gallon containers
Nominal Measured and Time Plateau	application rate/pot: 0.6; 6.0; 60.0; 600.0 ppm; not applicable
Duration, Parameter, and Sampling Frequency	74 days; BF; 74 days
Analytical Method and Analytical Details	liquid scintillation spectrometer (Packard Tri-Carb Model 2405); TLC; Plant samples were homogenized using a hexane-acetone extraction.;
Results Value, Result Type, and Results Standard Deviation	0.005; 0.008; 0.005; 0.007; BF (calculated from table); ±0.0017; ±0.0030; ±0.0035; ±0.0022
Calculation Basis and Basis	General Linear Model; plant uptake data were transformed to log10 because of the logarithmic application rates.; dry weight
Elimination, Metabolites, Kinetic Parameter, and Statistics	not applicable; not applicable; Regressions were done to predict phthalic acid uptake based on original soil application rate.; Chemical extraction efficiencies averaged 75%. Extraction efficiencies for phthalic acid from mature soybean (based on 14C from oxidation measurements) was 39.5%.

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Concurrent controls were included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups. The conditions of the exposure were documented.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.

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Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

		EVALUATION		
Domain		Metric	Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	High	The test species was reported and is routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed and no notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, and there were no differences among the study groups in organism attrition or health outcomes that influenced the outcome assessment.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical extraction efficiency, percent recovery, or mass balance were unclearly reported; however, these omissions were not likely to have a substantial impact on study results
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; bioaccumulation: terrestrial; experimental; other: Bioaccumulation Factor(BF) values in plants
Solvent, Reactivity, Storage, Stability	dissolved in ethanol; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; radiolabeled: Amersham; unlabeled: Fisher; NR; unlabeled: certified grade Notes: radiolabeled: CFA 766 Batch 5, specific activity 60 mCi/mmol
Test Organism and Test Organism Details	wheat (seed); Triticum aestivum L. “Butte”
Lipid Content, Test Temperature, pH, and Depuration Time	Not applicable; day: 29°C; night 21°C; soil pH 6.1; not applicable
Moisture, TOC, and Test Conditions Comments	80% field capacity; humidity varied inversely with temperature from 50-70%.; not applicable; Seeds were planted 4 days after PA application to soil (Norfolk sandy loam: 87% sand, 10% silt, 3% clay, 1.3% organic matter) in 2 gallon containers
Nominal Measured and Time Plateau	application rate/pot: 0.6; 6.0; 60.0; 600.0 ppm; not applicable
Duration, Parameter, and Sampling Frequency	74 days; BF; 74 days
Analytical Method and Analytical Details	liquid scintillation spectrometer (Packard Tri-Carb Model 2405); TLC; Plant samples were homogenized using a hexane-acetone extraction.;
Results Value, Result Type, and Results Standard Deviation	0; 0.0005; 0.0001; 0.0029; BF (calculated from table); ±0; ±0.0003; 0.00003; ±0.0015
Calculation Basis and Basis	General Linear Model; plant uptake data were transformed to log10 because of the logarithmic application rates.; dry weight
Elimination, Metabolites, Kinetic Parameter, and Statistics	not applicable; not applicable; Regressions were done to predict phthalic acid uptake based on original soil application rate.; Extraction efficiencies for phthalic acid from wheat (based on 14C from oxidation measurements) was assumed to be 43.4%.

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Concurrent controls were included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups. The conditions of the exposure were documented.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.

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Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

		EVALUATION		
Domain		Metric	Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	High	The test species was reported and is routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed and no notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, and there were no differences among the study groups in organism attrition or health outcomes that influenced the outcome assessment.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical extraction efficiency, percent recovery, or mass balance were unclearly reported; however, these omissions were not likely to have a substantial impact on study results
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; bioaccumulation: terrestrial; experimental; other: Bioaccumulation Factor (BF) values in plants
Solvent, Reactivity, Storage, Stability	dissolved in ethanol; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; radiolabeled: Amersham; unlabeled: Fisher; NR; unlabeled: certified grade Notes: radiolabeled: CFA 766 Batch 5, specific activity 60 mCi/mmol
Test Organism and Test Organism Details	soybean (seed); Glycine max (L.) Merr.
Lipid Content, Test Temperature, pH, and Depuration Time	Not applicable; day: 29°C; night 21°C; soil pH 6.1; not applicable
Moisture, TOC, and Test Conditions Comments	80% field capacity; humidity varied inversely with temperature from 50-70%.; not applicable; Seeds were planted 4 days after PA application to soil (Norfolk sandy loam: 87% sand, 10% silt, 3% clay, 1.3% organic matter) in 2 gallon containers
Nominal Measured and Time Plateau	application rate/pot: 0.6; 6.0; 60.0; 600.0 ppm; not applicable
Duration, Parameter, and Sampling Frequency	74 days; BF; 74 days
Analytical Method and Analytical Details	liquid scintillation spectrometer (Packard Tri-Carb Model 2405); TLC; Plant samples were homogenized using a hexane-acetone extraction.;
Results Value, Result Type, and Results Standard Deviation	0.010; 0.007; 0.008; 0.010; BF (calculated from table); ±0.0050; ±0.0060; ±0.0100; ±0.0036
Calculation Basis and Basis	General Linear Model; plant uptake data were transformed to log10 because of the logarithmic application rates.; dry weight
Elimination, Metabolites, Kinetic Parameter, and Statistics	not applicable; not applicable; Regressions were done to predict phthalic acid uptake based on original soil application rate.; Chemical extraction efficiencies averaged 75%. Extraction efficiencies for phthalic acid from soybean seed(based on 14C from oxidation measurements) was assumed to be 39.5%.

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Concurrent controls were included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups. The conditions of the exposure were documented.

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Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

		EVALUATION		
Domain		Metric	Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	High	The test species was reported and is routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed and no notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, and there were no differences among the study groups in organism attrition or health outcomes that influenced the outcome assessment.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical extraction efficiency, percent recovery, or mass balance were unclearly reported; however, these omissions were not likely to have a substantial impact on study results
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; bioaccumulation: terrestrial; experimental; other: Bioaccumulation Factor (BF) values in plants
Solvent, Reactivity, Storage, Stability	dissolved in ethanol; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; radiolabeled: Amersham; unlabeled: Fisher; NR; unlabeled: certified grade Notes: radiolabeled: CFA 766 Batch 5, specific activity 60 mCi/mmol
Test Organism and Test Organism Details	soybean (immature); Glycine max (L.) Merr.
Lipid Content, Test Temperature, pH, and Depuration Time	Not applicable; day: 29°C; night 21°C; soil pH 6.1; not applicable
Moisture, TOC, and Test Conditions Comments	80% field capacity; humidity varied inversely with temperature from 50-70%.; not applicable; Seeds were planted 4 days after PA application to soil (Norfolk sandy loam: 87% sand, 10% silt, 3% clay, 1.3% organic matter) in 2 gallon containers
Nominal Measured and Time Plateau	application rate/pot: 0.6; 6.0; 60.0; 600.0 ppm; not applicable
Duration, Parameter, and Sampling Frequency	21 days; BF; 21 days
Analytical Method and Analytical Details	liquid scintillation spectrometer (Packard Tri-Carb Model 2405); TLC; Plant samples were homogenized using a hexane-acetone extraction.;
Results Value, Result Type, and Results Standard Deviation	0.007; 0.006; 0.023; 0.005; BF (calculated from table); ±0.005; ±0.0012; ±0.0000; ±0.0009
Calculation Basis and Basis	General Linear Model; plant uptake data were transformed to log10 because of the logarithmic application rates.; dry weight
Elimination, Metabolites, Kinetic Parameter, and Statistics	not applicable; not applicable; Regressions were done to predict phthalic acid uptake based on original soil application rate.; Chemical extraction efficiencies averaged 75%. Extraction efficiencies for phthalic acid from immature soybean (based on 14C from oxidation measurements) was 31.4%.

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Concurrent controls were included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups. The conditions of the exposure were documented.

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Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

		EVALUATION		
Domain		Metric	Rating	Comments
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	High	The test species was reported and is routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed and no notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, and there were no differences among the study groups in organism attrition or health outcomes that influenced the outcome assessment.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical extraction efficiency, percent recovery, or mass balance were unclearly reported; however, these omissions were not likely to have a substantial impact on study results
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination High

Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; bioaccumulation: terrestrial; experimental; other: Bioaccumulation Factor (BF) values in plants
Solvent, Reactivity, Storage, Stability	dissolved in ethanol; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; radiolabeled: Amersham; unlabeled: Fisher; NR; unlabeled: certified grade Notes: radiolabeled: CFA 766 Batch 5, specific activity 60 mCi/mmol
Test Organism and Test Organism Details	wheat (immature); Triticum aestivum L. “Butte”
Lipid Content, Test Temperature, pH, and Depuration Time	Not applicable; day: 29°C; night 21°C; soil pH 6.1; not applicable
Moisture, TOC, and Test Conditions Comments	80% field capacity; humidity varied inversely with temperature from 50-70%.; not applicable; Seeds were planted 4 days after PA application to soil (Norfolk sandy loam: 87% sand, 10% silt, 3% clay, 1.3% organic matter) in 2 gallon containers
Nominal Measured and Time Plateau	application rate/pot: 0.6; 6.0; 600.0 ppm; not applicable
Duration, Parameter, and Sampling Frequency	40 days; BF; 40 days
Analytical Method and Analytical Details	liquid scintillation spectrometer (Packard Tri-Carb Model 2405); TLC; Plant samples were homogenized using a hexane-acetone extraction.;
Results Value, Result Type, and Results Standard Deviation	0.023; 0.025; 0.025; BF (calculated from table); ±0.0067; ±0.0057; ±0.0126
Calculation Basis and Basis	General Linear Model; plant uptake data were transformed to log10 because of the logarithmic application rates.; dry weight
Elimination, Metabolites, Kinetic Parameter, and Statistics	not applicable; not applicable; Regressions were done to predict phthalic acid uptake based on original soil application rate.; Extraction efficiencies for phthalic acid from wheat (based on 14C from oxidation measurements) was assumed to be 43.4%.

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Concurrent controls were included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups. The conditions of the exposure were documented.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.

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Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

		EVALUATION		
Domain		Metric	Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	High	The test species was reported and is routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed and no notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, and there were no differences among the study groups in organism attrition or health outcomes that influenced the outcome assessment.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical extraction efficiency, percent recovery, or mass balance were unclearly reported; however, these omissions were not likely to have a substantial impact on study results
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, EndPoint, Type, Guideline	none; bioaccumulation: terrestrial; experimental; other: Bioaccumulation Factor (BF) values in plants
Solvent, Reactivity, Storage, Stability	dissolved in ethanol; NR; NR; NR
Radiolabel, Source, State, Purity	14C-labeled; radiolabeled: Amersham; unlabeled: Fisher; NR; unlabeled: certified grade Notes: radiolabeled: CFA 766 Batch 5, specific activity 60 mCi/mmol
Test Organism and Test Organism Details	fescue; Festuca arundinacea
Lipid Content, Test Temperature, pH, and Depuration Time	Not applicable; day: 29°C; night 21°C; soil pH 6.1; not applicable
Moisture, TOC, and Test Conditions Comments	80% field capacity; humidity varied inversely with temperature from 50-70%.; not applicable; Seeds were planted 4 days after PA application to soil (Norfolk sandy loam: 87% sand, 10% silt, 3% clay, 1.3% organic matter) in 2 gallon containers
Nominal Measured and Time Plateau	application rate/pot: 0.6; 6.0; 60.0; 600.0 ppm; not applicable
Duration, Parameter, and Sampling Frequency	45 days; BF; 45 days
Analytical Method and Analytical Details	liquid scintillation spectrometer (Packard Tri-Carb Model 2405); TLC; Plant samples were homogenized using a hexane-acetone extraction.;
Results Value, Result Type, and Results Standard Deviation	0.038; 0.016; 0.023; 0.039; BF (calculated from table); ±0.0317; ±0.0028; NR; NR
Calculation Basis and Basis	General Linear Model; plant uptake data were transformed to log10 because of the logarithmic application rates.; dry weight
Elimination, Metabolites, Kinetic Parameter, and Statistics	not applicable; not applicable; Regressions were done to predict phthalic acid uptake based on original soil application rate.; Extraction efficiencies for phthalic acid from fescue (based on 14C from oxidation measurements) was 24.9%.

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Concurrent controls were included.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups. The conditions of the exposure were documented.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.

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Study Citation:	Dorney, J. R., Weber, J. B., Overcash, M. R., Strek, H. J. (1985). Plant uptake and soil retention of phthalic acid applied to Norfolk sandy loam. Journal of Agricultural and Food Chemistry 33(3):398-403.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	6826495

		EVALUATION		
Domain		Metric	Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	High	The test species was reported and is routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed and no notable uncertainties or limitations were expected to influence results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, and there were no differences among the study groups in organism attrition or health outcomes that influenced the outcome assessment.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The target chemical extraction efficiency, percent recovery, or mass balance were unclearly reported; however, these omissions were not likely to have a substantial impact on study results
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination — High

Study Citation:	Dagnelie, R. V. H., Descostes, M., Pointeau, I., Klein, J., Grenut, B., Radwan, J., LeBeau, D., Georgin, D., Giffaut, E. (2014). Sorption and diffusion of organic acids through clayrock: Comparison with inorganic anions. Journal of Hydrology 511:619-627.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	2523951

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; phthalic acid
Confidentiality, Type, Guideline	none; experimental; other: Not reported; Diffusion experiment
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	C14-labeled phthalic acid; Merck (unlabeled), synthesized in lab (radiolabeled); NR; >99.5% Notes: H2phthalic acid; proton excess balanced by NaOH addition.
Sampling Frequency, Sampling Details, and Number of Replicates	once; Samples centrifuged at 50,000 g for 1 hr, supernatant analyzed; Not reported
pH, Test Temperature, Buffer, and Test Details	7.15/8.0±0.1 when CO2 in water 10^-1.9 / 10^-3.5 atm, respectively; 22±2°C; Not reported; Sorption on Callovo-Oxfordian clayrock determination: two polypropylene diffusion cells, 175 and 130 mL respectively, with clayrock disks pre-equilibrated with synthetic porewater, spiked with 1.2E-4 mol/L test substance in the upstream reservoir
Matrix, Clay Silts and Organic Carbon, and CEC	clay; Not reported; Not reported
Bulk Density and Matrix Details	Not reported; Clayrock obtained from EST207 borehole, Meuse/Haute-Marne, France, -501.8 to 502.0 m
Media, Recovery, and Statistics	Synthetic porewater, CO2 3.34E-3 mol/L, with Na+, K+, Ca+2, Mg+2, Sr+2, Cl- and SO4-2; Not reported; One-site Langmuir model
Transformation Products, Equilibrium	phthalic acid-2: 69%, phthalic acid Mg+2: 12%, phthalic acid Ca+2: 12%, phthalic acid Na+: 7%; Agitated in Turbula mixer for 24 h to 2 mo;
Adsorption Details, and Equilibrium Desorption Details	Not reported
Reference Substance, Reference Substance Results, and Percent Adsorption	Not reported; Not reported; Not reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Log K_ads; 3.18 L/mol; Smax = 9.4E-4 mol/kg; Not Reported
Partition Coefficient Type and Partition Coefficient Results	Solid-solution distribution coefficients (Rd); 1.4 L/kg
Partition Coefficient Phase and Partition Coefficient Results	other; Rd = ([C0/C] - 1)*V/m = K*[Smax] where V = solution volume, m = clayrock dry mass, C0/C = initial/residual concentration in solution
Mass Balance	Not reported

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Controls were not explicitly included.

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Study Citation:	Dagnelie, R. V. H., Descostes, M., Pointeau, I., Klein, J., Grenut, B., Radwan, J., LeBeau, D., Georgin, D., Giffaut, E. (2014). Sorption and diffusion of organic acids through clayrock: Comparison with inorganic anions. Journal of Hydrology 511:619-627.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	2523951

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 4:	Test Substance Stability	Medium	Test substance preparation or storage were not reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was appropriate for the test substance.
	Metric 6:	Testing Conditions	Medium	Clayrock characteristics were not reported, starting test solution concentrations were not reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established and the test system was sealed to maintain test substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	Not applicable.
	Metric 10:	Sampling Methods	N/A	Not applicable.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining partition coefficients.
	Metric 12:	Test Substance Purity	High	Sampling methods were appropriate, sampling frequency was acceptable for the study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Some study details were not reported. Clayrock not explicitly autoclaved before use in study.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	Not applicable.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The analytical methods were appropriate, limits of detection were not reported. Raw data was not reported. Mass balance was not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods for partition coefficient determination were reported and applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable based on the method but several study details were omitted, which limits the ability for verification. Values were not compared to previous studies.
	Metric 18:	QSAR Models	N/A	Not applicable.

Overall Quality Determination — High

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Study Citation:	Dagnelie, R. V. H., Descostes, M., Pointeau, I., Klein, J., Grenut, B., Radwan, J., LeBeau, D., Georgin, D., Giffaut, E. (2014). Sorption and diffusion of organic acids through clayrock: Comparison with inorganic anions. Journal of Hydrology 511:619-627.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	2523951

EVALUATION

Domain	Metric	Rating	Comments

Study Citation:	Dagnelie, R. V. H., Descostes, M., Pointeau, I., Klein, J., Grenut, B., Radwan, J., LeBeau, D., Georgin, D., Giffaut, E. (2014). Sorption and diffusion of organic acids through clayrock: Comparison with inorganic anions. Journal of Hydrology 511:619-627.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	2523951

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; phthalic acid
Confidentiality, Type, Guideline	none; experimental; other: Not reported; Batch sorption experiments
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	C14-labeled phthalic acid; Merck (unlabeled), synthesized in lab (radiolabeled); NR; >99.5% Notes: H2phthalic acid; proton excess balanced by NaOH addition.
Sampling Frequency, Sampling Details, and Number of Replicates	NR; Effluent porewater analyzed; Not reported
pH, Test Temperature, Buffer, and Test Details	7.15/8.0±0.1 when CO2 in water 10^-1.9 / 10^-3.5 atm, respectively; 22±2°C; Not reported; Sorption on Callovo-Oxfordian clayrock determination: two polypropylene diffusion cells, 175 and 130 mL respectively, with clayrock disks pre-equilibrated with synthetic porewater, spiked with 1.2E-4 mol/L test substance in the upstream reservoir
Matrix, Clay Silts and Organic Carbon, and CEC	clay; Not reported; Not reported
Bulk Density and Matrix Details	2.41 kg/L (dry); Clayrock obtained from EST207 borehole, Meuse/Haute-Marne, France, -501.8 to 502.0 m
Media, Recovery, and Statistics	Synthetic porewater, CO2 3.34E-3 mol/L, with Na+, K+, Ca+2, Mg+2, Sr+2, Cl- and SO4-2; Not reported; Least-square fitting model
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	phthalic acid-2: 69%, phthalic acid Mg+2: 12%, phthalic acid Ca+2: 12%, phthalic acid Na+: 7%; Through diffusion for 240 min; Not reported
Reference Substance, Reference Substance Results, and Percent Adsorption	Not reported; Not reported; Not reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Not Reported; Not Reported; Not Reported; Not Reported
Partition Coefficient Type and Partition Coefficient Results	Kd; 0.23 L/kg
Partition Coefficient Phase and Partition Coefficient Results	other; dC/dt = De / (e_a + p*Kd) *[d^2C/dx^2] = [D_e*d^2C/a*dx^2]D_e = effective diffusion constant = 2.1 m^2/sa = rock capacity factor = 0.63e_a = diffusion-accessible porosity = 0.08and p = bulk dry density = 2.41 kg/L
Mass Balance	Not reported

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substance were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	Medium	Test substance preparation or storage were not reported.
Domain 3: Test Conditions				

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Study Citation:	Dagnelie, R. V. H., Descostes, M., Pointeau, I., Klein, J., Grenut, B., Radwan, J., LeBeau, D., Georgin, D., Giffaut, E. (2014). Sorption and diffusion of organic acids through clayrock: Comparison with inorganic anions. Journal of Hydrology 511:619-627.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	2523951

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was appropriate for the test substance.
	Metric 6:	Testing Conditions	Medium	Clayrock characteristics were not reported, starting test solution concentrations were not reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established and the test system was sealed to maintain test substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	Not applicable.
	Metric 10:	Sampling Methods	N/A	Not applicable.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining partition coefficients.
	Metric 12:	Test Substance Purity	High	Sampling methods were appropriate, sampling frequency was acceptable for the study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Some study details were not reported. Clayrock not explicitly autoclaved before use in study.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	Not applicable.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The analytical methods were appropriate, limits of detection were not reported. Raw data was not reported. Mass balance was not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods for partition coefficient determination were reported and applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable based on the method but several study details were omitted, which limits the ability for verification. Values were not compared to previous studies.
	Metric 18:	QSAR Models	N/A	Not applicable.

Overall Quality Determination — High

Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic acid.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	7274473

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, Type, Guideline	None; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Sampling Frequency, Sampling Details, and Number of Replicates	Not Reported; Not Reported; Not Reported
pH, Test Temperature, Buffer, and Test Details	Not Reported; Not Reported; Not Reported; Not Reported
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; Not Reported; Not Reported
Bulk Density and Matrix Details	Not Reported; Not Reported
Media, Recovery, and Statistics	Not Reported; Not Reported; Not Reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not Reported; Not Reported; Not Reported
Reference Substance, Reference Substance Results, and Percent Adsorption	Not Reported; Not Reported; Not Reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Koc; Not Reported; 2-31; Not Reported
Partition Coefficient Type and Partition Coefficient Results	Not Reported; Not Reported
Partition Coefficient Phase and Partition Coefficient Results	Not Reported; Not Reported
Mass Balance	Not Reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	The test substance was identified.
Metric 2:	Test Substance Purity	N/A	This metric does not apply to this type of study.
Domain 2: Test Design			
Metric 3:	Study Controls	N/A	This metric does not apply to this type of study.
Metric 4:	Test Substance Stability	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
Domain 3: Test Conditions			

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Study Citation:	NCBI, (2020). PubChem Database: Compound Summary: Phthalic acid.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	7274473

Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
	Metric 6:	Testing Conditions	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
	Metric 7:	Testing Consistency	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
	Metric 8:	System Type and Design	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this type of study.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
	Metric 12:	Test Substance Purity	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Detail regarding this metric were not limited; however, additional information may be included in the primary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this type of study.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Due to limited information, evaluation of the reasonableness of the study results was not possible; however, additional information may be included in the primary source.
	Metric 18:	QSAR Models	N/A	This metric does not apply to this type of study.

Overall Quality Determination — Medium

* Related References: Von Oepen B et al; Chemosphere 22: 285-304 (1991)

Study Citation:	Rasamimanana, S., Lefèvre, G., Dagnelie, R. V. H. (2017). Various causes behind the desorption hysteresis of carboxylic acids on mudstones. Chemosphere 168:559-567.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	3859136

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, Type, Guideline	none; experimental; other: Not reported; Batch sorption experiments
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	2,3,4,5-(3)H labeled: 60 Ci/mol; Merck (unradiolabeled); ARC (2,3,4,5-(3)H labelled); synthesized in lab (14-C labeled); NR; >99.5% (unradiolabeled)
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Centrifuged at 15,000 rpm for 1 hr, aliquot of aqueous phase analyzed; 3 per concentration and blank
pH, Test Temperature, Buffer, and Test Details	3 per concentration and blank; 21±1°C; NaOH or HCl; Synthetic pore water mixed with 1 gram mudstone powder, solid:solution ratio 50 g/L in sealed polycarbonate tubes, and spiked with 10E-3 or 10E-6 M of the test substance. Tubes kept in sub-oxic glove box
Matrix, Clay Silts and Organic Carbon, and CEC	clay; Not reported; 14.6±0.4 meq/100 g
Bulk Density and Matrix Details	Not reported; Callovo-Oxfordian clay formation (east of Paris basin): illite (17-21%), interstratified illite-smectite (20-24%), kaolinite (3-5%), chlorite (2-3%), quartz (17-21%), calcite (20-23%), dolomite (3-6%), and accessory minerals (5%); porosity 18±2%
Media, Recovery, and Statistics	Synthetic porewater solution; Not reported; Langmuir isotherm
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; 6 weeks; Equilibrium reached in "a few hours"; Porewater renewed in same water/rock ratio; equilibrium achieved in 48 hr
Reference Substance, Reference Substance Results, and Percent Adsorption	Not reported; Not reported; Not Reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Not Reported; Not Reported; Not Reported; Not Reported
Partition Coefficient Type and Partition Coefficient Results	Distribution ratio (Rd); Langmuir adsorption constant (K); Rd max = 1.6 L/kg; Rd = 1.6±0.5 L/kg; K = 1.7E3 L/mol
Partition Coefficient Phase and Partition Coefficient Results	other; Rd = [adsorbed]/[solution] = ([n_0 - n(t)]/n(t))*v/m where n = moles, v = solution volume, m = dry mass of clayLangmuir R^2 = 0.9992Rd desorption: 2.0±0.3Desorption hysteresis index: 1.0±1.5 to 3.3±0.8
Mass Balance	No sorption to glassware observed in blank

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	High	The source and purity of the test substances were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	A blank control was included and no sorption to glassware was observed.

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Study Citation:	Rasamimanana, S., Lefèvre, G., Dagnelie, R. V. H. (2017). Various causes behind the desorption hysteresis of carboxylic acids on mudstones. Chemosphere 168:559-567.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	3859136

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 4:	Test Substance Stability	Medium	Minimal details on test substance preparation and storage reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Appropriate test conditions (temperature, equilibrium duration, rock characteristics) were reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established and the test system was capable of maintaining test substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	Not applicable.
	Metric 10:	Sampling Methods	N/A	Not applicable.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining partitioning.
	Metric 12:	Test Substance Purity	Medium	Sampling methods were appropriate but frequency was not reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	No notable sources of uncertainty were identified.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	Not applicable.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The analytical method was appropriate; limits of detection were not reported. Raw data was not reported. Partitioning was not normalized to carbon content.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Sorption isotherm determination was reported and appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable based on the method. Sorption and desorption Rds were comparable to values published by previous studies.
	Metric 18:	QSAR Models	N/A	Not applicable.

Overall Quality Determination — High

Study Citation:	Rasamimanana, S., Lefèvre, G., Dagnelie, R. V. H. (2017). Adsorption of polar organic molecules on sediments: Case-study on Callovian-Oxfordian claystone. Chemosphere 181:296-303.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	3972631

EXTRACTION

Parameter	Data
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, Type, Guideline	none; experimental; other: Not reported; batch sorption experiments
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	3H or 13C radiolabeled.; ARC. inc; NR; NR Notes: Mixture of labelled and non-labelled test substance
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Sampling tubes centrifuged at 50000 g for 1 h; 3
pH, Test Temperature, Buffer, and Test Details	ca. 7.0±0.2 (maintained using soluble carbonates); 21±1°C; P_CO2/P^0 = 4000±1000 ppm; 1 g dried clay mixed with synthetic pore water and spiked with 10E-6 or 10E-3 mol/L test substance, mixed in polycarbonate tubes with sealing caps. Test systems kept in sub-oxic glove box
Matrix, Clay Silts and Organic Carbon, and CEC	other; 50±5% clay minerals, 30±0.5% carbonates, 0.61% TOC; 18±1 eq/100 gram
Bulk Density and Matrix Details	Not reported; 125 um Callovian-Oxfordian rock formation (Meuse/Haute-Marne, France), -498 m depth; 50-55% clay minerals (20% illite, 21% interstratified illite/smectite, 5.5% kaolinite, and 4% chlorite), 18-20% tectosilicates, 22-35% carbonates
Media, Recovery, and Statistics	Synthetic pore water; Not reported; Langmuir sorption isotherm; multiple linear regression: no correlation between Rd and molecular mass or pKa observed, linear correlation between Rd and Kow (R^2 = 0.77)
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; 6 weeks; NR
Reference Substance, Reference Substance Results, and Percent Adsorption	NR; NR; NR
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	NR; NR; NR; NR
Partition Coefficient Type and Partition Coefficient Results	Rd (solid/solution distribution ratio) and Langmuir affinity constant (K); Rd = 1.53 (range: 1.3 - 1.7) L/kg; K = 1.22E3 L/mol
Partition Coefficient Phase and Partition Coefficient Results	other; Rd = [adsorbed]/[equilibrium]Langmuir Q = 1.23E-3 mol/KgAdsorption mechanism driven by clayey materials
Mass Balance	No sorption to test tubes observed in blanks

EVALUATION

Domain		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name.
	Metric 2:	Test Substance Purity	Medium	The source of the test substance was reported, purity was not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Controls were included and the test substance did not sorb to the test system.

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Study Citation:	Rasamimanana, S., Lefèvre, G., Dagnelie, R. V. H. (2017). Adsorption of polar organic molecules on sediments: Case-study on Callovian-Oxfordian claystone. Chemosphere 181:296-303.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	3972631

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 4:	Test Substance Stability	Medium	Minimal details on test substance preparation and storage were reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Appropriate testing conditions were reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
	Metric 8:	System Type and Design	Medium	Equilibrium details were not reported. The test system was capable of maintaining test substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	Not applicable.
	Metric 10:	Sampling Methods	N/A	Not applicable.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining partitioning behavior.
	Metric 12:	Test Substance Purity	Medium	Sampling methods were appropriate but frequency was not reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	No notable sources of uncertainty were identified.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	Not applicable.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The analytical method was appropriate; limit of detection, raw data, or carbon normalized values were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical analysis and sorption determination were reported and appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable based on the method but were not compared to results from previous studies.
	Metric 18:	QSAR Models	N/A	Not applicable.
Overall Quality Determination			**High**	

Study Citation:	U.S. EPA, (2020). Chemistry Dashboard Information for Phthalic Acid. 88-99-3..
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	7274211

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; Phthalic acid
Confidentiality, Type, Guideline	None; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Sampling Frequency, Sampling Details, and Number of Replicates	Not Reported; Not Reported; Not Reported
pH, Test Temperature, Buffer, and Test Details	Not Reported; Not Reported; Not Reported; Not Reported
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; Not Reported; Not Reported
Bulk Density and Matrix Details	Not Reported; Not Reported
Media, Recovery, and Statistics	Not Reported; Not Reported; Not Reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not Reported; Not Reported; Not Reported
Reference Substance, Reference Substance Results, and Percent Adsorption	Not Reported; Not Reported; Not Reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Koc; Not Reported; 11.7; Not Reported
Partition Coefficient Type and Partition Coefficient Results	Not Reported; Not Reported
Partition Coefficient Phase and Partition Coefficient Results	Not Reported; Not Reported
Mass Balance	Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified.
	Metric 2:	Test Substance Purity	N/A	This metric does not apply to this type of study.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	This metric does not apply to this type of study.
	Metric 4:	Test Substance Stability	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
Domain 3: Test Conditions				

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Study Citation:	U.S. EPA, (2020). Chemistry Dashboard Information for Phthalic Acid. 88-99-3..
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	7274211

			EVALUATION	
Domain		Metric	Rating	Comments
	Metric 5:	Test Method Suitability	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
	Metric 6:	Testing Conditions	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
	Metric 7:	Testing Consistency	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
	Metric 8:	System Type and Design	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this type of study.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
	Metric 12:	Test Substance Purity	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Detail regarding this metric were not reported; however, additional information may be included in the primary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Detail regarding this metric were not limited; however, additional information may be included in the primary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this type of study.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Due to limited information, evaluation of the reasonableness of the study results was not possible; however, additional information may be included in the primary source.
	Metric 18:	QSAR Models	N/A	This metric does not apply to this type of study.

Overall Quality Determination Medium

Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; phthalic acid
Confidentiality, Type, Guideline	none; experimental; experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Merck Co., Germany; NR; NR Notes: NR
Test Method Details, Test Condition Details, and Test Consistency Details	Bioreactor was fed 500 mg/L PA in synthetic wastewater solution Nitrogen and phosphorous were supplied for a COD:N:P ratio of 100:7:1. After a one-month start-up period, the bioreactor was initially operated at HRT of 48 h and decreased to 6 h.; Inoculum was acclimatized wastewater treatment sludge. Feed pH adjusted if it dropped to <6. Hydraulic retention time (HRT): 48 h; 24 h; 12 h; 6 h. Corresponding effluent pH: 7.0; 6.9; 6.7; 6.3.; Each HRT step was continued to a steady state condition where the variations in effluent parameters maintained constant.
System Type Design	6 L fixed activated sludge bioreactor and 3 L settling tank, 700 sq m/cu m of biofilm growing surface area.
Sampling Frequency and Sampling Details	continuously monitored; influent, effluent, sludge
Test Temperature	28–32°C
Results Details	Effluent concentrations: 0.15; 2.6; 16; 133 mg/L. PA in sludge: 89; 121; 146; 171 mg/kg.
Analytical Method and Analytical Details	PA measured by HPLC-UV. pH, alkalinity, total suspended solids (TSS), volatile suspended solids (VSS), BOD and COD were analyzed according to Standard Methods.; The limit of detection and quantity of detection were 5 and 50 µl, respectively.
Transformation Products, Statistics, and Kinetics	Not reported; >99%; >99%; 96.8%; 73.4% of PA was removed at 48; 24; 12; 6 HRT steps for 500 mg/L PA feed rate.; Maximum substrate utilization capacity for PA was determined to be 2.45 g CODrem/g VSS d; biodegradation rate constant was 6.88 cu m/g/hour.
Reference Substance and Reference Substance Results	Not applicable; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source of the test substance was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.

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Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

		EVALUATION		
Domain	Metric		Rating	Comments
	Metric 8:	System Type and Design	High	Equilibrium was established.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were reported
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination High

Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; phthalic acid
Confidentiality, Type, Guideline	none; experimental; experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Merck Co., Germany; NR; NR Notes: NR
Test Method Details, Test Condition Details, and Test Consistency Details	Bioreactor was fed 10 mg/L PA in synthetic wastewater solution Nitrogen and phosphorous were supplied for a COD:N:P ratio of 100:7:1. After a one-month start-up period, the bioreactor was initially operated at HRT of 48 h and decreased to 6 h.; Inoculum was acclimatized wastewater treatment sludge. Feed pH adjusted if it dropped to <6. Hydraulic retention time (HRT): 48 h; 24 h; 12 h; 6 h. Corresponding effluent pH: 7.7; 7.5; 7.8; 7.5.; Each HRT step was continued to a steady state condition where the variations in effluent parameters maintained constant.
System Type Design	6 L fixed activated sludge bioreactor and 3 L settling tank, 700 sq m/cu m of biofilm growing surface area.
Sampling Frequency and Sampling Details	continuously monitored; influent, effluent, sludge
Test Temperature	28–32°C
Results Details	Effluent concentrations: 0.004; 0.005; 0.005; 0.05 mg/L. PA in sludge: 31; 36; 43; 58 mg/kg.
Analytical Method and Analytical Details	PA measured by HPLC-UV. pH, alkalinity, total suspended solids (TSS), volatile suspended solids (VSS), BOD and COD were analyzed according to Standard Methods.; The limit of detection and quantity of detection were 5 and 50 µl, respectively.
Transformation Products, Statistics, and Kinetics	Not reported; >99% of PA was removed at all HRT steps for 10 mg/L PA feed rate.; Maximum substrate utilization capacity for PA was determined to be 2.45 g CODrem/g VSS d; biodegradation rate constant was 6.88 cu m/g/hour.
Reference Substance and Reference Substance Results	Not applicable; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source of the test substance was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	High	Equilibrium was established.

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Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were reported
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination High

Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; phthalic acid
Confidentiality, Type, Guideline	none; experimental; experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Merck Co., Germany; NR; NR Notes: NR
Test Method Details, Test Condition Details, and Test Consistency Details	Bioreactor was fed 20 mg/L PA in synthetic wastewater solution Nitrogen and phosphorous were supplied for a COD:N:P ratio of 100:7:1. After a one-month start-up period, the bioreactor was initially operated at HRT of 48 h and decreased to 6 h.; Inoculum was acclimatized wastewater treatment sludge. Feed pH adjusted if it dropped to <6. Hydraulic retention time (HRT): 48 h; 24 h; 12 h; 6 h. Corresponding effluent pH: 7.6; 7.6; 7.4; 7.4.; Each HRT step was continued to a steady state condition where the variations in effluent parameters maintained constant.
System Type Design	6 L fixed activated sludge bioreactor and 3 L settling tank, 700 sq m/cu m of biofilm growing surface area.
Sampling Frequency and Sampling Details	continuously monitored; influent, effluent, sludge
Test Temperature	28–32°C
Results Details	Effluent concentrations: 0.016; 0.018; 0.031; 0.1 mg/L. PA in sludge: 39; 48; 54; 69 mg/kg.
Analytical Method and Analytical Details	PA measured by HPLC-UV. pH, alkalinity, total suspended solids (TSS), volatile suspended solids (VSS), BOD and COD were analyzed according to Standard Methods.; The limit of detection and quantity of detection were 5 and 50 µl, respectively.
Transformation Products, Statistics, and Kinetics	Not reported; >99% of PA was removed at all HRT steps for 20 mg/L PA feed rate.; Maximum substrate utilization capacity for PA was determined to be 2.45 g CODrem/g VSS d; biodegradation rate constant was 6.88 cu m/g/hour.
Reference Substance and Reference Substance Results	Not applicable; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source of the test substance was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	High	Equilibrium was established.

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Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were reported
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination High

Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; phthalic acid
Confidentiality, Type, Guideline	none; experimental; experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Merck Co., Germany; NR; NR Notes: NR
Test Method Details, Test Condition Details, and Test Consistency Details	Bioreactor was fed 50 mg/L PA in synthetic wastewater solution Nitrogen and phosphorous were supplied for a COD:N:P ratio of 100:7:1. After a one-month start-up period, the bioreactor was initially operated at HRT of 48 h and decreased to 6 h.; Inoculum was acclimatized wastewater treatment sludge. Feed pH adjusted if it dropped to <6. Hydraulic retention time (HRT): 48 h; 24 h; 12 h; 6 h. Corresponding effluent pH: 7.2; 7.1; 6.9; 6.7.; Each HRT step was continued to a steady state condition where the variations in effluent parameters maintained constant.
System Type Design	6 L fixed activated sludge bioreactor and 3 L settling tank, 700 sq m/cu m of biofilm growing surface area.
Sampling Frequency and Sampling Details	continuously monitored; influent, effluent, sludge
Test Temperature	28–32°C
Results Details	Effluent concentrations: 0.017; 0.034; 0.18; 1.5 mg/L. PA in sludge: 51; 67; 74; 91 mg/kg.
Analytical Method and Analytical Details	PA measured by HPLC-UV. pH, alkalinity, total suspended solids (TSS), volatile suspended solids (VSS), BOD and COD were analyzed according to Standard Methods.; The limit of detection and quantity of detection were 5 and 50 µl, respectively.
Transformation Products, Statistics, and Kinetics	Not reported; >99%; >99%; >99%; 97% of PA was removed at 48; 24; 12; 6 HRT steps for 50 mg/L PA feed rate.; Maximum substrate utilization capacity for PA was determined to be 2.45 g CODrem/g VSS d; biodegradation rate constant was 6.88 cu m/g/hour.
Reference Substance and Reference Substance Results	Not applicable; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source of the test substance was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	High	Equilibrium was established.

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Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were reported
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination High

Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; phthalic acid
Confidentiality, Type, Guideline	none; experimental; experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Merck Co., Germany; NR; NR Notes: NR
Test Method Details, Test Condition Details, and Test Consistency Details	Bioreactor was fed 100 mg/L PA in synthetic wastewater solution Nitrogen and phosphorous were supplied for a COD:N:P ratio of 100:7:1. After a one-month start-up period, the bioreactor was initially operated at HRT of 48 h and decreased to 6 h.; Inoculum was acclimatized wastewater treatment sludge. Feed pH adjusted if it dropped to <6. Hydraulic retention time (HRT): 48 h; 24 h; 12 h; 6 h. Corresponding effluent pH: 7; 6.9; 6.5; 6.4.; Each HRT step was continued to a steady state condition where the variations in effluent parameters maintained constant.
System Type Design	6 L fixed activated sludge bioreactor and 3 L settling tank, 700 sq m/cu m of biofilm growing surface area.
Sampling Frequency and Sampling Details	continuously monitored; influent, effluent, sludge
Test Temperature	28–32°C
Results Details	Effluent concentrations: 0.23; 0.15; 0.94; 5 mg/L. PA in sludge: 63; 77; 89; 103 mg/kg.
Analytical Method and Analytical Details	PA measured by HPLC-UV. pH, alkalinity, total suspended solids (TSS), volatile suspended solids (VSS), BOD and COD were analyzed according to Standard Methods.; The limit of detection and quantity of detection were 5 and 50 µl, respectively.
Transformation Products, Statistics, and Kinetics	Not reported; >99%; >99%; >99%; 95% of PA was removed at 48; 24; 12; 6 HRT steps for 100 mg/L PA feed rate.; Maximum substrate utilization capacity for PA was determined to be 2.45 g CODrem/g VSS d; biodegradation rate constant was 6.88 cu m/g/hour
Reference Substance and Reference Substance Results	Not applicable; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source of the test substance was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	High	Equilibrium was established.

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Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were reported
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination High

Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

EXTRACTION

Parameter	**Data**
CASRN and Test Material	88-99-3; phthalic acid
Confidentiality, Type, Guideline	none; experimental; experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Merck Co., Germany; NR; NR Notes: NR
Test Method Details, Test Condition Details, and Test Consistency Details	Bioreactor was fed 200 mg/L PA in synthetic wastewater solution Nitrogen and phosphorous were supplied for a COD:N:P ratio of 100:7:1. After a one-month start-up period, the bioreactor was initially operated at HRT of 48 h and decreased to 6 h.; Inoculum was acclimatized wastewater treatment sludge. Feed pH adjusted if it dropped to <6. Hydraulic retention time (HRT): 48 h; 24 h; 12 h; 6 h. Corresponding effluent pH: 7.5; 7.2; 6.8; 6.5.; Each HRT step was continued to a steady state condition where the variations in effluent parameters maintained constant.
System Type Design	6 L fixed activated sludge bioreactor and 3 L settling tank, 700 sq m/cu m of biofilm growing surface area.
Sampling Frequency and Sampling Details	continuously monitored; influent, effluent, sludge
Test Temperature	28–32°C
Results Details	Effluent concentrations: 0.11; 0.38; 3.5; 27 mg/L. PA in sludge: 72; 91; 107; 117 mg/kg.
Analytical Method and Analytical Details	PA measured by HPLC-UV. pH, alkalinity, total suspended solids (TSS), volatile suspended solids (VSS), BOD and COD were analyzed according to Standard Methods.; The limit of detection and quantity of detection were 5 and 50 µl, respectively.
Transformation Products, Statistics, and Kinetics	Not reported; >99%; >99%; 98.2%; 86.5% of PA was removed at 48; 24; 12; 6 HRT steps for 200 mg/L PA feed rate.; Maximum substrate utilization capacity for PA was determined to be 2.45 g CODrem/g VSS d; biodegradation rate constant was 6.88 cu m/g/hour
Reference Substance and Reference Substance Results	Not applicable; Not Reported

EVALUATION

Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified definitively by name.
	Metric 2:	Test Substance Purity	High	The source of the test substance was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	High	Equilibrium was established.

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Study Citation:	Pirsaheb, M., Mesdaghinia, A. R., Shahtaheri, S. J., Zinatizadeh, A. A. (2009). Kinetic evaluation and process performance of a fixed film bioreactor removing phthalic acid and dimethyl phthalate. Journal of Hazardous Materials 167(1-3):500-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1599783

			EVALUATION	
Domain		Metric	Rating	Comments
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty in the measurements, and statistical techniques and between study groups were considered and accounted for in data evaluation.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The target chemical concentrations, extraction efficiency, percent recovery, or mass balance were reported
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods or kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination High

List of Abbreviations and Acronyms for Data Quality Evaluation and Extraction Tables

Term	Definition
BAF	Biaccumulation Factor
BCF	Bioconcentration Factor
BMF	Biomagnification Factor
BSAF	Biota-sediment Accumulation Factor
C	Concentration
CASRN	Chemical Abstract Service registry number
DOC	Dissolved Organic Carbon
dw	Dry weight
DW	Drinking Water
DWTP	Drinking Water Treatment Plant
EPA	Environmental Protection Agency
ESI	Electrospray Ionisation
FID	Flame Ionisation Detector
FPD	Flame Photometric Detector
GC	Gas Chromatography
g/L	Grams per Liter
HLC	Henry's Law Constant
HPLC	High-performance liquid chromatography
ISO	International Organization for Standardization
K_{oa}	Octanol-Air partition coefficient
K_{oc}	Organic carbon-water partition coefficient
K_{ow}	Octanol-Water partition coefficient
L/d	Liters per day
LOD	Limit of Detection
LOQ	Limit of Quantification
lw	Lipid weight
M	Molarity (mol/L = moles per Liter)
mL/min	Milliliters per minute
mM	Millimolar
MDL	Method Detection Limit
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
mg/m^3	Milligrams per cubic meter
MRL	Method Reporting Limit
MS	Mass Spectrometry
n	Sample Size
N/A	Not applicable
ND	Non-Detection
ng/L	Nanograms per Liter

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Term	Definition
nm	Nanometers
NR	Not Reported
OECD	Organisation for Economic Co-operation and Development
· OH	Hydroxyl radical
OPE	Organophosphate Ester
pg/L	Picograms per Liter
ppm	parts per million
QSAR	Quantatative Structure Activity Relationship
RSD	Relative Standard Deviation
SI	Supplemental Information
SIM	Selected Ion Monitoring
SPE	Solid Phase Extraction
STP	Sewage Treatment Plant
TMF	Trophic Magnification Factor
TOC	Total Organic Carbon
TOF	Time of Flight
μg/L or μg/mL	micrograms per liter or per milliliter
UPLC	Ultra-performance liquid chromatography
US or USA	United States of America
UV (UV-Vis)	Ultra Violet (Visible)
ww	Wet Weight
WWTP	Wastewater Treatment Plant