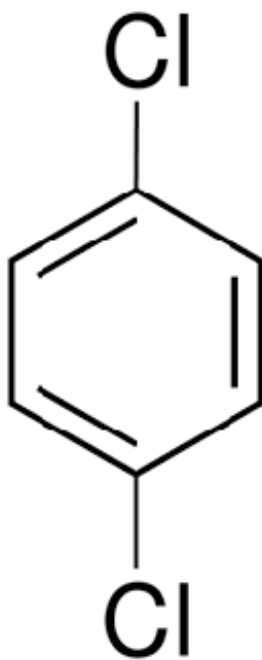

**Draft Data Quality Evaluation and Data Extraction Information for
Environmental Fate and Transport for
p-Dichlorobenzene**

Systematic Review Support Document for the Draft Risk Evaluation

CASRN: 106-46-7



June 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 p-Dichlorobenzene* 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 Draft Systematic Review Protocol for p-Dichlorobenzene*. 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.

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4933297	Watts, C. D., Moore, K. (1988). Fate and transport of organic compounds in rivers. <i>Commission of the European Communities Water Pollution Research Reports</i> , 4 :154-168.	330
3797830	Wilson, J. T., Enfield, C. G., Dunlap, W. J., Cosby, R. L., Foster, D. A., Baskin, L. B. (1981). Transport and fate of selected organic pollutants in a sandy soil. <i>Journal of Environmental Quality</i> 10(4):501-506.	335
1482440	Wise, W. R., Charbeneau, R. J. (1994). In situ estimation of transport parameters a field demonstration. <i>Groundwater</i> 32(3):420-430.	337
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5475887	Gerstle, R., Carvatti, J. (1987). Sludge incineration and hazardous air pollutants. <i>Sludge Management Series</i> 17:169-174.	343
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1989859	Kuntz, K. W., Warry, N. D. (1983). Chlorinated organic contaminants in water and suspended sediments of the lower Niagara River. <i>Journal of Great Lakes Research</i> 9(2):241-248.	349
5254562	Liljestrand, H. M., Lee, Y. D. (1991). Sorption kinetics of non-ionic organic pollutants onto suspended sediment. <i>Water Science and Technology</i> 23(1/3):447-454.	351
5254867	Matter-Müller, C., Gujer, W., Giger, W., Stumm, W. (1980). Non-biological elimination mechanisms in a biological sewage treatment plant. <i>Progress in Water Technology</i> 12:299-314.	353
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4214180	Monsanto, (1987). Monsanto Pensacola plant ground water assessment feasibility study with 19 chemicals with attachments and cover letter dated 121887.	359
1265686	(1982). Fate of Priority Pollutants in Publicly Owned Treatment Works, Volume I.	361
2803053	Parker, W. J., Thompson, D. J., Bell, J. P., Melcer, H. (1993). Fate of volatile organic compounds in municipal activated sludge plants. <i>Water Environment Research</i> 65(1):58-65.	363
660424	Prasad, S. S. (1992). Predicting the environmental distribution of compounds with unknown physicochemical properties from known pesticide properties. <i>Journal of AOAC International</i> 75(5):916-924.	365
29959	Rathbun, R. E. (1998). Transport, behavior, and fate of volatile organic compounds in streams.	367
5281966	Reinhart, D. R., Pohland, F. G., Stevens, D. K. (1991). Mathematical fate modeling of hazardous organic pollutants during codisposal with municipal refuse. <i>Hazardous Waste and Hazardous Materials</i> 8(1):85-97.	371
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4912320	Staley, C. S., Case, M. J. (1987). An evaluation of in situ microcosms for validating aquatic fate and transport models. <i>Environmental Monitoring and Assessment</i> 8(2):103-112.	375
2310704	Tansel, B., Eyma, R. R. (1999). Volatile organic contaminant emissions from wastewater treatment plants during secondary treatment. <i>Water, Air, and Soil Pollution</i> 112(3-4):3-4.	379
1335443	Topp, E., Scheunert, I., Attar, A., Korte, F. (1986). Factors affecting the uptake of carbon-14 labeled organic chemicals by plants from soil. <i>Ecotoxicology and Environmental Safety</i> 11(2):219-228.	381
5257084	Truong, K. N., Blackburn, J. W. (1984). The stripping of organic chemicals in biological treatment processes: a new approach to prediction of the fates of organic chemicals in biological processes. <i>Environmental Progress</i> 3(3):143-152.	383
5443237	Van Luin, A. B., Van Starkenburg, W. (1985). Hazardous Substances in Waste Water. <i>Water Science and Technology</i> 17(6-7):843-853.	387
3267482	Wania, F. (1997). Modelling the fate of non-polar organic chemicals in an ageing snow pack. <i>Chemosphere</i> 35(10):2345-2363.	389
1333567	Webber, M. D., Goodin, J. D. (1992). The persistence of VOCs PAHs PCBs and phthalates in sludge-treated soil. <i>Canadian Journal of Soil Science</i> 72(3):348.	391
3797830	Wilson, J. T., Enfield, C. G., Dunlap, W. J., Cosby, R. L., Foster, D. A., Baskin, L. B. (1981). Transport and fate of selected organic pollutants in a sandy soil. <i>Journal of Environmental Quality</i> 10(4):501-506.	393
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Other Properties

p-Dichlorobenzene

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Study Citation:	Arnts, R. R., Seila, R. L., Bufalini, J. J. (1989). Determination of room temperature OH rate constants for acetylene, ethylene dichloride, ethylene dibromide, p-dichlorobenzene and carbon disulfide. Journal of Air Pollution Control Association 39(4):453-460.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	4223423

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; other: OH rate constant measurement of 1,4-dichlorobenzene.
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: Irradiations were performed on mixtures of ethane and p-dichlorobenzene at ratios of 1:1, 2:1 and 16:1.
Duration and Test Temperature	60 minutes; 297±2 K
Light Source, Intensity, and additional light details	Ultraviolet black-lamps; Not reported; Two banks of eighteen 40W lamps were used for 12 irradiations.
Source Wavelength Lower and Upper	300 nm; Not reported
Test Details and Control	1,4-DCB and ethane were introduced into Teflon bag by syringe injection. Samples were taken every 6 minutes, before and during the 60 minute sampling period.; 0.6-1.2% of the test substance was lost to the container wall per hour.
Initial Concentration, Reference Compound	Not reported Not reported; Ethane
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; Not reported
Indirect Type Results, Indirect Rate Constant Lower and Upper	Not reported; Not Reported; (5.1±1.2) x 10 ⁻¹³ cm ³ molecules ⁻¹ s ⁻¹
Method Details Results and Products	Hewlett Packard GC with flame ionization and flame photometric detection was used.; Not Reported
Details Results	
Parameter Value and Parameter Results	Not reported; Not reported
Reference Substance Results, Percent Degradation Results and Standard	Not reported; Not reported; The pre-irradiation analytical precision for p-dichlorobenzene: ±0.60%
Deviation Results	
Results Remarks, Sample time Results, Results	Not reported; Not reported; Not reported
Details	

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
	Metric 1:	High	The test substance was identified using common nomenclature.
	Metric 2:	Medium	The test substance purity was not quantitatively reported but the omission is unlikely to have a substantial impact on the study results.
Domain 2: Test Design			
	Metric 3:	High	Concentrations were measured before irradiation began to determine whether the test substance was lost to the wall of the container and the loss was discussed.

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Study Citation:	Arnts, R. R., Seila, R. L., Bufalini, J. J. (1989). Determination of room temperature OH rate constants for acetylene, ethylene dichloride, ethylene dibromide, p-dichlorobenzene and carbon disulfide. Journal of Air Pollution Control Association 39(4):453-460.			
OECD Harmonized Template:	Photolysis in Air			
HERO ID:	4223423			
Domain	Metric	EVALUATION		Comments
	Metric 4:	Test Substance Stability	Medium	Some details regarding the test substance preparation and storage conditions were not reported but the omissions are unlikely to have a substantial 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 not reported differences among 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	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 the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The sampling methods were reported and appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Uncertainty was reported in the results and not likely to influence the outcome assessment.
	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 test substance concentrations were not reported at each sampling period but the analytical method was appropriate and enough information was provided to confirm removal was due to indirect photolysis.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	The statistical analysis and kinetic calculations were appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results are comparable 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:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	5017839

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene
Confidentiality, Type, Guideline	no; not specified; other: not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR
Duration and Test Temperature	NR; NR
Light Source, Intensity, and additional light details	NR; NR; NR
Source Wavelength Lower and Upper	NR; NR
Test Details and Control	NR; NR
Initial Concentration, Reference Compound	NR NR; NR
Substance Wavelength Lower and Upper	NR; NR
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	NR; NR; NR
Indirect Type Results, Indirect Rate Constant Lower and Upper	Reacting with OH radicals; 4.8E-13 cm ³ /molecules; NR
Method Details Results and Products	NR; NR
Details Results	
Parameter Value and Parameter Results	NR; NR
Reference Substance Results, Percent Degradation Results and Standard Deviation Results	NR; NR; NR
Results Remarks, Sample time Results, Results Details	NR; NR; NR

EVALUATION			
Domain	Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High
	Metric 2:	Test Substance Purity	Medium
Domain 2: Test Design	Metric 3:	Study Controls	Medium
	Metric 4:	Test Substance Stability	Medium
Domain 3: Test Conditions			

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Study Citation:		ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.		
OECD Harmonized Template:		Photolysis in Air		
HERO ID:		5017839		
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	Medium	Test method not reported; more details may be in the primary source.
	Metric 6:	Testing Conditions	Medium	Testing conditions were not reported; more details may be in the primary source.
	Metric 7:	Testing Consistency	Medium	Testing conditions were not reported; more details may be in the primary source.
	Metric 8:	System Type and Design	Medium	System type and design were not reported; more details may be in the primary source.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type.
	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	Medium	Sampling method was not reported; more details may be in the source cited.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables not reported; more details may be in the source cited.
	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	Medium	The analytical method was not reported; more details may be in the source cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not reported; more details may be in the source cited.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.

Overall Quality Determination**Medium**

* Related References: Cites secondary source Klopffer et al. 1986 (HERO ID 8217741).

Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Photolysis in Air			
HERO ID:	5017839			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene			
Confidentiality, Type, Guideline	no; not specified; other: not reported			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR			
Duration and Test Temperature	NR; NR			
Light Source, Intensity, and additional light details	NR; NR; NR			
Source Wavelength Lower and Upper	NR; NR			
Test Details and Control	NR; NR			
Initial Concentration, Reference Compound	NR NR; NR			
Substance Wavelength Lower and Upper	NR; NR			
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	NR; NR; NR			
Indirect Type Results, Indirect Rate Constant Lower and Upper	Reacting with OH radicals; 3.2E-13 cm^3/molecules; NR			
Method Details Results and Products Details Results	NR; NR			
Parameter Value and Parameter Results	NR; NR			
Reference Substance Results, Percent Degradation Results and Standard Deviation Results	NR; NR; NR			
Results Remarks, Sample time Results, Results Details	NR; NR; NR			
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	Medium	The test substance source and purity were not reported; more details may be in the primary source.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	No study controls were reported; more details may be in the primary source.
	Metric 4:	Test Substance Stability	Medium	Test substance stability not reported; more details may be in the primary source.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	Medium	Test method not reported; more details may be in the primary source.
	Metric 6:	Testing Conditions	Medium	Testing conditions were not reported; more details may be in the primary source.
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Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Photolysis in Air			
HERO ID:	5017839			
Domain	Metric	EVALUATION		Comments
	Metric 7:	Testing Consistency	Medium	Testing conditions were not reported; more details may be in the primary source.
	Metric 8:	System Type and Design	Medium	System type and design were not reported; more details may be in the primary source.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type.
	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	Medium	Sampling method was not reported; more details may be in the source cited.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables not reported; more details may be in the source cited.
	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	Medium	The analytical method was not reported; more details may be in the source cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not reported; more details may be in the source cited.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.

Overall Quality Determination**Medium**

* Related References: Cites secondary source Wahner and Zetsch (1983) (HERO ID 3383022 and 38025)

Study Citation:	Freitag, D., Ballhorn, L., Geyer, H., Korte, F. (1985). Environmental hazard profile of organic chemicals: An experimental method for the assessment of the behaviour of organic chemicals in the ecosphere by means of simple laboratory tests with 14C labelled chemicals. Chemosphere 14(10):1589-1616.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	85251

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14-C labelled; Synthesized by the study laboratory; NR; >98% Notes: Reported generally for the 100 chemicals investigated by the study.
Duration and Test Temperature	17 hours; Not reported
Light Source, Intensity, and additional light details	Not reported; Not reported; Not reported
Source Wavelength Lower and Upper	>290 nm; Not reported
Test Details and Control	Test substance sorbed to silico-gel, % CO2, organics, and unreacted were measured.; Not reported
Initial Concentration, Reference Compound	Not reported 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 Reported; Not Reported
Indirect Type Results, Indirect Rate Constant Lower and Upper	Not Reported; Not Reported; Not Reported
Method Details Results and Products	Not reported; Not Reported
Details Results	
Parameter Value and Parameter Results	Not Reported; Not Reported
Reference Substance Results, Percent Degradation Results and Standard Deviation Results	Not Reported; 5.1%; Not Reported
Results Remarks, Sample time Results, Results Details	Degradation as a percentage of applied test substance.; 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 test substance was synthesized by the study laboratory and purity was reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	Medium	Limited information on test substance preparation was reported, no storage information was provided.

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Study Citation:	Freitag, D., Ballhorn, L., Geyer, H., Korte, F. (1985). Environmental hazard profile of organic chemicals: An experimental method for the assessment of the behaviour of organic chemicals in the ecosphere by means of simple laboratory tests with 14C labelled chemicals. Chemosphere 14(10):1589-1616.			
OECD Harmonized Template:	Photolysis in Air			
HERO ID:	85251			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Low	Limited testing conditions were provided, only lower range of UV and duration were reported.
	Metric 7:	Testing Consistency	High	Test set up was consistent across test systems.
	Metric 8:	System Type and Design	N/A	Not applicable.
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 photolytic degradation.
	Metric 12:	Test Substance Purity	Medium	Sampling methods were not reported, frequency was acceptable.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Limited study details makes study interpretation difficult.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	Not applicable.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Analytical methods were not reported. Raw data was not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical and kinetic calculations were not conducted.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	The lack of study details make verification of study results difficult.
	Metric 18:	QSAR Models	N/A	Not applicable.
Overall Quality Determination		Medium		

Study Citation:	Grosjean, D. (1990). Atmospheric chemistry of toxic contaminants 1. Reaction rates and atmospheric persistence. Journal of the Air and Waste Management Association 40(10):1397-1402.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	625143

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-Dichlorobenzene
Confidentiality, Type, Guideline	None; QSAR; other: Not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Duration and Test Temperature	Not applicable; Not applicable
Light Source, Intensity, and additional light details	Not applicable; Not applicable; Not applicable
Source Wavelength Lower and Upper	Not applicable; Not applicable
Test Details and Control	QSAR developed based on structure-reactivity relationships of analogues, available literature rate constants, and ionization potential; Not applicable
Initial Concentration, Reference Compound	Not applicable Not applicable; Not applicable
Substance Wavelength Lower and Upper	Not applicable; Not applicable
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	Not reported; Not reported; Not reported
Indirect Type Results, Indirect Rate Constant Lower and Upper	Reaction with OH radical; 3.3×10^{-12} cm ³ /molecule sec; Not applicable
Method Details Results and Products	Not Reported; Not applicable
Details Results	
Parameter Value and Parameter Results	2-8 days; Atmospheric half-life based on hydroxyl radical removal (OH = 10^6 molecules/cm)
Reference Substance Results, Percent Degradation Results and Standard	Not applicable; Not applicable; Not reported
Deviation Results	
Results Remarks, Sample time Results, Results Details	Not Reported; Not applicable; Not Reported

EVALUATION				
Domain	Metric		Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High	The test substance was definitively identified.
	Metric 2:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	The metric is not applicable to this study type.
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.

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Study Citation:	Grosjean, D. (1990). Atmospheric chemistry of toxic contaminants 1. Reaction rates and atmospheric persistence. Journal of the Air and Waste Management Association 40(10):1397-1402.			
OECD Harmonized Template:	Photolysis in Air			
HERO ID:	625143			
Domain		EVALUATION		Comments
	Metric	Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	N/A	The metric is not applicable to this study type.
	Metric 6:	Testing Conditions	N/A	The metric is not applicable to this study type.
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this study type.
	Metric 8:	System Type and Design	N/A	This metric met the criteria for high confidence as expected for this type of study.
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	N/A	The metric is not applicable to this study type.
	Metric 12:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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	N/A	The metric is not applicable to this study type.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results were reasonable.
	Metric 18:	QSAR Models	High	The QSAR model had a defined, unambiguous endpoint and parameters of model performance were reported.
Overall Quality Determination			High	

Study Citation:	Grosjean, D. (1990). Atmospheric chemistry of toxic contaminants 1. Reaction rates and atmospheric persistence. Journal of the Air and Waste Management Association 40(10):1397-1402.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	625143

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-Dichlorobenzene
Confidentiality, Type, Guideline	None; QSAR; other: Not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Duration and Test Temperature	Not applicable; Not applicable
Light Source, Intensity, and additional light details	Not applicable; Not applicable; Not applicable
Source Wavelength Lower and Upper	Not applicable; Not applicable
Test Details and Control	QSAR developed based on structure-reactivity relationships of analogues, available literature rate constants, and ionization potential; Not applicable
Initial Concentration, Reference Compound	Not applicable Not applicable; Not applicable
Substance Wavelength Lower and Upper	Not applicable; Not applicable
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	Not reported; Not reported; Not reported
Indirect Type Results, Indirect Rate Constant Lower and Upper	Reaction with O3; Negligible; Not applicable
Method Details Results and Products	Not Reported; Not applicable
Details Results	
Parameter Value and Parameter Results	> 1 month; Atmospheric half-life based on O3 removal (O3 = 100 ppb)
Reference Substance Results, Percent Degradation Results and Standard	Not applicable; Not applicable; Not reported
Deviation Results	
Results Remarks, Sample time Results, Results Details	Not Reported; Not applicable; Not Reported

EVALUATION				
Domain		Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High	The test substance was definitively identified.
	Metric 2:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	The metric is not applicable to this study type.
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	N/A	The metric is not applicable to this study type.

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Study Citation:	Grosjean, D. (1990). Atmospheric chemistry of toxic contaminants 1. Reaction rates and atmospheric persistence. Journal of the Air and Waste Management Association 40(10):1397-1402.			
OECD Harmonized Template:	Photolysis in Air			
HERO ID:	625143			
EVALUATION				
Domain		Metric	Rating	Comments
	Metric 6:	Testing Conditions	N/A	The metric is not applicable to this study type.
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this study type.
	Metric 8:	System Type and Design	N/A	This metric met the criteria for high confidence as expected for this type of study.
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	N/A	The metric is not applicable to this study type.
	Metric 12:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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	N/A	The metric is not applicable to this study type.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results were reasonable.
	Metric 18:	QSAR Models	High	The QSAR model had a defined, unambiguous endpoint and parameters of model performance were reported.
Overall Quality Determination			High	

Study Citation:	Grosjean, D. (1990). Atmospheric chemistry of toxic contaminants 1. Reaction rates and atmospheric persistence. Journal of the Air and Waste Management Association 40(10):1397-1402.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	625143

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-Dichlorobenzene
Confidentiality, Type, Guideline	None; QSAR; other: Not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Duration and Test Temperature	Not applicable; Not applicable
Light Source, Intensity, and additional light details	Not applicable; Not applicable; Not applicable
Source Wavelength Lower and Upper	Not applicable; Not applicable
Test Details and Control	QSAR developed based on structure-reactivity relationships of analogues, available literature rate constants, and ionization potential; Not applicable
Initial Concentration, Reference Compound	Not applicable Not applicable; Not applicable
Substance Wavelength Lower and Upper	Not applicable; Not applicable
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	Not reported; Not reported; Not reported
Indirect Type Results, Indirect Rate Constant Lower and Upper	Reaction with NO ₃ ; Negligible; Not applicable
Method Details Results and Products	Not Reported; Not applicable
Details Results	
Parameter Value and Parameter Results	> 1 month; Atmospheric half-life based on NO ₃ removal (NO ₃ = 50 ppt)
Reference Substance Results, Percent Degradation Results and Standard	Not applicable; Not applicable; Not reported
Deviation Results	
Results Remarks, Sample time Results, Results Details	Not Reported; Not applicable; Not Reported

EVALUATION				
Domain	Metric		Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High	The test substance was definitively identified.
	Metric 2:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	The metric is not applicable to this study type.
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	N/A	The metric is not applicable to this study type.

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Study Citation:	Grosjean, D. (1990). Atmospheric chemistry of toxic contaminants 1. Reaction rates and atmospheric persistence. Journal of the Air and Waste Management Association 40(10):1397-1402.			
OECD Harmonized Template:	Photolysis in Air			
HERO ID:	625143			
EVALUATION				
Domain		Metric	Rating	Comments
	Metric 6:	Testing Conditions	N/A	The metric is not applicable to this study type.
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this study type.
	Metric 8:	System Type and Design	N/A	This metric met the criteria for high confidence as expected for this type of study.
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	N/A	The metric is not applicable to this study type.
	Metric 12:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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	N/A	The metric is not applicable to this study type.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results were reasonable.
	Metric 18:	QSAR Models	High	The QSAR model had a defined, unambiguous endpoint and parameters of model performance were reported.
Overall Quality Determination			High	

Study Citation:	Klamt, A. (1993). Estimation of gas-phase hydroxyl radical rate constants of organic compounds from molecular orbital calculations. Chemosphere 26(7):1273-1289.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	660158

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; Structural Estimation
Confidentiality, Type, Guideline	None; QSAR; other: Estimation of gas-phase hydroxyl radical rate constants using molecular orbital calculations
Solvent, Reactivity, Storage, Stability	NA; NA; NA; NA
Radiolabel, Source, State, Purity	NA; NA; NA; NA Notes: Estimation based on functional groups in chemical
Duration and Test Temperature	Not reported; Not reported
Light Source, Intensity, and additional light details	Not reported; Not reported; Not reported
Source Wavelength Lower and Upper	Not reported; Not reported
Test Details and Control	OH rate constants determined using quantitative relationships between MO-based descriptors for electronic properties of reaction sites and rate constants for OH-radical reaction mechanisms.; Not reported
Initial Concentration, Reference Compound	Not reported; Not reported; Experimental data for comparison
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; Not reported
Indirect Type Results, Indirect Rate Constant Lower and Upper	Hydroxyl radical rate constant; 0.44; Not reported
Method Details Results and Products	Rate constant for OH radical addition to aromatic rings (sp ² -carbon atoms); Not reported
Details Results	
Parameter Value and Parameter Results	Not reported; Rate constant units: 10E-12 cm ³ /molecule/s
Reference Substance Results, Percent Degradation Results and Standard	0.42; Not reported; uncertainty factor = 1.4; r-squared = 0.97
Deviation Results	
Results Remarks, Sample time Results, Results Details	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 definitively identified.
	Metric 2:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	The metric is not applicable to this study type.
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.

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Study Citation:	Klamt, A. (1993). Estimation of gas-phase hydroxyl radical rate constants of organic compounds from molecular orbital calculations. Chemosphere 26(7):1273-1289.			
OECD Harmonized Template:	Photolysis in Air			
HERO ID:	660158			
		EVALUATION		
Domain	Metric	Rating	Comments	
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	N/A	The metric is not applicable to this study type.
	Metric 6:	Testing Conditions	N/A	The metric is not applicable to this study type.
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this study type.
	Metric 8:	System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.
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	N/A	The metric is not applicable to this study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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	This metric met the criteria for high confidence as expected for this type of study.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical analysis reported and acceptable.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results were reasonable.
	Metric 18:	QSAR Models	High	The QSAR model had a defined, unambiguous endpoint and parameters of model performance were reported.
Overall Quality Determination			High	

Study Citation:	Kochany, J., Bolton, J. R. (1992). Mechanism of photodegradation of aqueous organic pollutants: 2. Measurement of the primary rate constants for reaction of hydroxy radicals with benzene and some halobenzenes using an EPR spin-trapping method following the photolysis of hydrogen peroxide. Environmental Science & Technology 26(2):262-265.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	660160

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; other: Analysis of photodegradation using spin trapping with Electron Paramagnetic Resonance detection
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Duration and Test Temperature	Irradiation time: 1 minute; Not reported
Light Source, Intensity, and additional light details	UV lamp; Not reported; 150-W mercury-xenon lamp
Source Wavelength Lower and Upper	Not reported; Not reported
Test Details and Control	Hydroxyl radicals generated by H2O2 photolysis; a spin trap molecule, DMPO, reacts rapidly with radicals to produce spin adduct nitroxide radicals that can be detected by EPR.; Not reported
Initial Concentration, Reference Compound	5-50 micromolar; 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 reported; Not reported
Indirect Type Results, Indirect Rate Constant Lower and Upper	Rate constant for reaction with OH radicals at pH 7.0; 5.4 (10E9/M·s); Not reported
Method Details Results and Products	Rate constant is the average calculated from both amplitude and slope measurements; Not reported
Details Results	
Parameter Value and Parameter Results	Not reported; Not reported
Reference Substance Results, Percent Degradation Results and Standard Deviation Results	Not reported; Not reported; ±0.4
Results Remarks, Sample time Results, Results Details	Experimental variation using a Pyrex filter to block light radiation above 300 nm indicated that the rate of reaction of hydroxyl radicals is much greater than direct photolysis rates.; Not reported; Not reported

EVALUATION				
Domain	Metric		Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High	The test substance was definitively identified.
	Metric 2:	Test Substance Purity	Low	The test substance source and 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.

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Study Citation:	Kochany, J., Bolton, J. R. (1992). Mechanism of photodegradation of aqueous organic pollutants: 2. Measurement of the primary rate constants for reaction of hydroxy radicals with benzene and some halobenzenes using an EPR spin-trapping method following the photolysis of hydrogen peroxide. Environmental Science & Technology 26(2):262-265.			
OECD Harmonized Template:	Photolysis in Air			
HERO ID:	660160			
Domain		Metric	EVALUATION Rating	Comments
	Metric 4:	Test Substance Stability	Medium	The test substance stability and homogeneity 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	Medium	Non standard method; however, the results were comparable to literature values.
	Metric 6:	Testing Conditions	Medium	Some details omitted; however, these factors 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	High	This metric met the criteria for high confidence as expected for this type of study.
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	Some details omitted; however, these factors were not likely to have a substantial impact on study results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	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	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical analysis reported and acceptable.
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:	Wahner, A., Zetzsch, C. (1981). Reactions of disubstituted benzenes with OH in the gas phase: Benzene, o-, m-, and p-dichlorobenzene, and p-chloroaniline. :138.
OECD Harmonized Template:	Photolysis in Air
HERO ID:	5253125

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 14DCB
Confidentiality, Type, Guideline	None; Experimental; other: Guideline not specified
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; Gas; >99%
Duration and Test Temperature	Not reported; 294±1 K
Light Source, Intensity, and additional light details	Flash lamp with condenser and CaF ₂ -window; Not reported; 100 flashes at 2 J, dwell times of 5 ms, 2ms, or 1ms
Source Wavelength Lower and Upper	Not reported; 125 nm
Test Details and Control	OH radicals are generated by pulsed vacuum UV photolysis of water vapor at 0.02 - 0.05 Torr.; Not reported
Initial Concentration, Reference Compound	50-250 Torr Ar; 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 Reported; Not Reported
Indirect Type Results, Indirect Rate Constant Lower and Upper	Reacting with OH radicals; Not Reported; 3.3±0.3 x 10 ⁻¹³ cm ³ /s
Method Details Results and Products Details Results	First-order rate constant determined via semilogarithmic plot of resonance fluorescence intensity of OH vs time in the presence of the test substance $T^{-1} = (T_0)^{-1} + k[R]$ Where T^{-1} = decay rate of OH, $(T_0)^{-1}$ = caused by diffusion losses or OH radicals reacting with each other ($= 2 \cdot 12 / s$), $[R]$ = concentration of test substance, k = rate constant; Not reported
Parameter Value and Parameter Results	Not Reported; Not Reported
Reference Substance Results, Percent Degradation Results and Standard Deviation Results	Not Reported; Not reported; Not Reported
Results Remarks, Sample time Results, Results Details	Rate constants were independent of water vapor concentration and flash energy. This indicates constant stoichiometry of the reactions, and that photolysis products are not significantly involved in the kinetics of OH decay. Using the global tropospheric average $[OH] = 4.10 \times 10^5 / \text{cm}^3$, the tropospheric residence time was determined to be 3 months; Not Reported; Not Reported

EVALUATION			
Domain	Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High
	Metric 2:	Test Substance Purity	High
Domain 2: Test Design	Metric 3:	Study Controls	Medium
	Metric 4:	Test Substance Stability	Medium

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Study Citation:	Wahner, A., Zetzsch, C. (1981). Reactions of disubstituted benzenes with OH in the gas phase: Benzene, o-, m-, and p-dichlorobenzene, and p-chloroaniline. :138.			
OECD Harmonized Template:	Photolysis in Air			
HERO ID:	5253125			
Domain	Metric	EVALUATION		Comments
		Rating		
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 were monitored and reported.
	Metric 7:	Testing Consistency	High	Testing conditions were consistent across samples and 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	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 the intended outcomes of interest.
	Metric 12:	Test Substance Purity	Medium	Limited details on sampling methods were reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variation between replicates and diffusive loss of OH were accounted for.
	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 information on analytical method were reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were described in detail and appropriate for the study.
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:	Haag, W. R., Yao, C. C. D. (1992). Rate constants for reaction of hydroxyl radicals with several drinking water contaminants. Environmental Science & Technology 26(5):1005-1013.
OECD Harmonized Template:	Photolysis in Water
HERO ID:	658815

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; calculation; EPA OTS 796.3700 (Direct Photolysis Rate in Water by Sunlight): Estimated rate constants for reaction of hydroxyl radicals using structure-activity relationships.
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Duration and Test Temperature	Not applicable; Not applicable
Light Source, Intensity, and additional light details	Not applicable; Not applicable; Not applicable
Source Wavelength Lower and Upper	Not applicable; Not applicable
Test Details and Control	correlated rate constants for aromatics in water with Hammett delta constants; Not reported
Initial Concentration and Reference Compound	Not applicable Not applicable; m-dichlorobenzene
Substance Wavelength Lower and Upper	Not reported; Not reported
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	Not applicable; Not applicable; Not applicable
Indirect Rate Constant Lower and Upper	Not reported; 4E9 M-1sec-1
Method Details Results and Products	log kHO. = 9.829-0.318(Sum delta); Not applicable
Details Results	
Parameter Value and Parameter Results	other; hydroxyl radical reaction rate (kHO.)
Reference Compound, Reference	m-dichlorobenzene; 5.0+/-1.0E9 M-1-sec-1; Not applicable; Not applicable
Substance Results, Percent Degradation Results and Standard Deviation Results	
Results Remarks, Sample time Results, Results Details	reference chemical experimentally determined by ozone decomposition; 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 and CASRN.
	Metric 2:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	The metric is not applicable to this study type.
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.
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:	Haag, W. R., Yao, C. C. D. (1992). Rate constants for reaction of hydroxyl radicals with several drinking water contaminants. Environmental Science & Technology 26(5):1005-1013.			
OECD Harmonized Template:	Photolysis in Water			
HERO ID:	658815			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 6:	Testing Conditions	High	Testing conditions were 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	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	N/A	The metric is not applicable to this study type.
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	N/A	The metric is not applicable to this study type.
	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:	Klán, P., Del Favero, D., Ansorgová, A., Klánová, J., Holoubek, I. (2001). Photodegradation of halobenzenes in water ice. Environmental Science and Pollution Research 8(3):195-200.
OECD Harmonized Template:	Photolysis in Water
HERO ID:	1942833

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; EPA OTS 796.3700 (Direct Photolysis Rate in Water by Sunlight): Photolysis products in water-ice solutions
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Aldrich Chemical Company; NR; 99+%
Duration and Test Temperature	5 hours; -20°C
Light Source, Intensity, and additional light details	Mercury lamp; Not reported; Multiwavelength, 125W, medium pressure mercury lamp in a quartz vessel
Source Wavelength Lower and Upper	254 nm; 300 nm
Test Details and Control	Sealed quartz sample tubes; Not reported
Initial Concentration and Reference Compound	2E-4 Molar; 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 reported; Not reported
Indirect Rate Constant Lower and Upper	Not reported; Not reported
Method Details Results and Products	GC/MS using an internal standard method; reproducibility $\pm 15\%$; Coupling products: dichloro and trichloro-PCB congeners; dehalogenation products: chlorobenzene, benzene; photosolvolysis products:
Parameter Value and Parameter Results	Not Reported; Photoproduct concentration
Reference Compound, Reference	Not reported; Not reported; Not reported; $\pm 15\%$
Substance Results, Percent Degradation Results and Standard Deviation Results	
Results Remarks, Sample time Results, Results Details	Benzene: 0.035, phenol: ND, o, m, p-phenylphenol: ND, chlorobenzene: 0.563, o-dichlorobenzene: 0.012, m-dichlorobenzene: 0.013, p-dichlorobenzene: -, biphenyl: <0.010, o-chlorobiphenyl: ND, m-chlorobiphenyl: 0.010, p-chlorobiphenyl: 0.010, Dichlorobiphenyls: 0.294, trichlorobiphenyls: 0.308, tetrachlorobiphenyls: 0.010, dichloroterphenyls: <0.010, trichloroterphenyls: <0.010, tetrachloroterphenyls: <0.010; 5 hours; Product concentrations in melted aqueous solutions are reported in mg/L.

EVALUATION				
Domain	Metric		Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High	The test substance identified by chemical name.
	Metric 2:	Test Substance Purity	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Low	Controls were not included.
	Metric 4:	Test Substance Stability	Low	The test substance stability, homogeneity, preparation, and storage conditions were not reported and these factors may influence the test substance.

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Study Citation:	Klán, P., Del Favero, D., Ansorgová, A., Klánová, J., Holoubek, I. (2001). Photodegradation of halobenzenes in water ice. Environmental Science and Pollution Research 8(3):195-200.			
OECD Harmonized Template:	Photolysis in Water			
HERO ID:	1942833			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable.
	Metric 6:	Testing Conditions	Medium	This metric met the criteria for medium 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	High	This metric met the criteria for high confidence as expected for this type of study.
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	Medium	Details were omitted; however, the lack of data is not likely to hinder the interpretation of the results.
	Metric 12:	Test Substance Purity	Medium	Details were omitted; however, the lack of data is not likely to hinder the interpretation of the results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Loss due to other process was not 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	Recovery and mass balance not reported; study focused on byproduct formation; analytical detail was limited.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	The study results may be limited due to lack of detail.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		Medium		

Study Citation:	Kochany, J., Bolton, J. R. (1992). Mechanism of Photodegradation of Aqueous Organic Pollutants, 2: Measurement of the Primary Rate Constants for Reaction of OH Radicals with Benzene and Some Halobenzenes Using an EPR Spin-Trapping Method Following the Photolysis of H ₂ O ₂ . Environmental Science and Technology 26(2):262-265.
OECD Harmonized Template:	Photolysis in Water
HERO ID:	5254143

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; EPA OTS 796.3700 (Direct Photolysis Rate in Water by Sunlight): Non guideline photodegradation study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Duration and Test Temperature	180 seconds; Not reported
Light Source, Intensity, and additional light details	UV lamp; (150-W mercury-xenon lamp, Conrad Hanovia 901 B001; Not reported
Source Wavelength Lower and Upper	without Pyrex filter (<300 nm); with Pyrex filter (>300 nm)
Test Details and Control	Spin trap with 5,5'-dimethylpyrroline IV-oxide (DMPO) forms free radicals to stable nitroxides (spin adducts). The reaction of hydroxyl radicals were generated by H ₂ O ₂ photolysis.; Yes, no test substance and no light trials performed
Initial Concentration and Reference Compound	5-50 ?M; Not reported
Substance Wavelength Lower and Upper	natural light; Not reported
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	Not reported; Not reported; Not reported
Indirect Rate Constant Lower and Upper	Not reported; Not reported
Method Details Results and Products	Not reported; Not reported
Details Results	
Parameter Value and Parameter Results	Not reported; Not reported
Reference Compound, Reference	Not reported; Not reported; Not reported; see remarks
Substance Results, Percent Degradation Results and Standard Deviation Results	
Results Remarks, Sample time Results, Results Details	hydroxyl radical rate constant: 5.3±0.4x10 ⁹ at pH 3.5, 5.4±0.4x10 ⁹ at pH 7.0 and 4.3±0.4x10 ⁹ at pH 11.0 M-1-s-1; NR; 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 reported; purity not reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	Control details were reported.
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.
Domain 3: Test Conditions				

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Study Citation:	Kochany, J., Bolton, J. R. (1992). Mechanism of Photodegradation of Aqueous Organic Pollutants, 2: Measurement of the Primary Rate Constants for Reaction of OH Radicals with Benzene and Some Halobenzenes Using an EPR Spin-Trapping Method Following the Photolysis of H2O2. Environmental Science and Technology 26(2):262-265.			
OECD Harmonized Template:	Photolysis in Water			
HERO ID:	5254143			
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	Testing conditions were 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	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	N/A	The metric is not applicable to this study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Sources of variability and uncertainty in the measurements, and statistical techniques were not discussed in detail.
	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	N/A	The metric is not applicable to this study type.
	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:	Meunier, L., Pilichowski, J. F., Boule, P. (2001). Photochemical behaviour of 1,4-dichlorobenzene in aqueous solution. Canadian Journal of Chemistry 79(7):1179-1186.
OECD Harmonized Template:	Photolysis in Water
HERO ID:	2176435

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; EPA OTS 796.3700 (Direct Photolysis Rate in Water by Sunlight): Direct photolysis: UV spectra and phototransformation products
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Aldrich; White crystalline solid; 99+% Notes: Used without further purification
Duration and Test Temperature	irradiation for a few hours; Not reported
Light Source, Intensity, and additional light details	low pressure mercury lamp (germicidal lamp); Not reported; incident photon flow 1.33E+14 photons cm ⁻³ s ⁻¹
Source Wavelength Lower and Upper	254 nm; 275-350 nm
Test Details and Control	Direct photolysis was studied by irradiating aqueous solutions in a quartz reactor; at 254 nm and at 275-350 nm.; Not reported
Initial Concentration and Reference Compound	4.7E-4 Molar; Not reported
Substance Wavelength Lower and Upper	264; 280 (maximum at 271 nm)
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	0.050±0.01; Not reported; Not reported
Indirect Rate Constant Lower and Upper	Not reported; Not reported
Method Details Results and Products	No absorption was detected above 290 nm.; Major product: hydroquinone; minor products: 4-chlorophenol (accumulates more at 254 nm; trans-formed into hydroquinone), 2,5-dichlorophenol, hydroxybenzoquinone
Details Results	not applicable; Not reported
Parameter Value and Parameter Results	Not reported; Not reported; Not reported; Not reported
Reference Compound, Reference	Not reported; Not reported; Not reported; Not reported
Substance Results, Percent Degradation Results and Standard Deviation Results	Not reported; Not reported; Not reported
Results Remarks, Sample time Results, Results Details	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 definitively identified.
	Metric 2:	Test Substance Purity	High	The source and purity (>99%) were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Low	A study control was not reported.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, and 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:	Meunier, L., Pilichowski, J. F., Boule, P. (2001). Photochemical behaviour of 1,4-dichlorobenzene in aqueous solution. Canadian Journal of Chemistry 79(7):1179-1186.			
OECD Harmonized Template:	Photolysis in Water			
HERO ID:	2176435			
Domain		Metric	EVALUATION	
			Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The method was appropriate.
	Metric 6:	Testing Conditions	Medium	Temperature was not reported.
	Metric 7:	Testing Consistency	Medium	The testing consistency was not reported.
	Metric 8:	System Type and Design	High	The system type and design were appropriate.
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	Medium	UV spectrum and phototransformation products reported; however, rate constants and half-life were not reported.
	Metric 12:	Test Substance Purity	High	The sampling method was appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Confounding variables were noted or identified.
	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 transformation products and UV spectrum were 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	Medium	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:	Real, F. J., Benitez, F. J., Rodriguez, C. (2007). Elimination of benzene and chlorobenzenes by photodegradation and ozonation processes. Chemical Engineering Communications 194(6):811-827.
OECD Harmonized Template:	Photolysis in Water
HERO ID:	1953447

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; EPA OTS 796.3700 (Direct Photolysis Rate in Water by Sunlight): Photodegradation in water
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Aldrich; NR; 99%
Duration and Test Temperature	10 minutes (monochromatic), 20 minutes (polychromatic); 20±0.5°C
Light Source, Intensity, and additional light details	low-pressure mercury vapor lamp; 2.03E6 E/s1; monochromatic radiation (Heraeus TNN 15=32, nominal electrical power 15 W); polychromatic radiation (Heraeus TQ150, nominal electrical power 50 W)
Source Wavelength Lower and Upper	254 nm (monochromatic); 185 nm (polychromatic); 436 nm (polychromatic)
Test Details and Control	Photodegradation with UV at pH 3, 5, 7, 9. Generation of OH radicals using H2O2 at pH 7.; Not reported
Initial Concentration and Reference Compound	3.5E-5 Molar; Not reported
Substance Wavelength Lower and Upper	Not reported; Not reported
Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper	theta (mol/E)= 0.63, 0.55, 0.57, 0.68 at pH 3, 5, 7, 9, respectively; Not reported; Not reported
Indirect Rate Constant Lower and Upper	Not Reported; Not Reported
Method Details Results and Products	Not reported; Not reported
Details Results	
Parameter Value and Parameter Results	kUV= 600, 580, 730 and 700/sec by UV radiation alone at pH 3, 5, 7 and 9, respectively; photogenerated hydroxy radicals
Reference Compound, Reference	Not reported; p-chlorobenzoic acid; Xp = 62, 56.4, 57.4 and 56% after 20 minutes at pH 3, 5, 7 and 9, respectively; NR
Substance Results, Percent Degradation Results and Standard Deviation Results	
Results Remarks, Sample time Results, Results Details	Not Reported; 20 minutes; Results with polychromatic irradiation at pH 7: Xp = 95.1% (10 minutes), rate constant = 5.28E3/second. When additional 10,000 and 20,000M H2O2 added at pH 7: kUVH = 1480 and 2500/sec, Xp = 64.6 and 80.1 after 20 minutes, respectively

EVALUATION				
Domain	Metric		Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High	The test substance identified by chemical name.
	Metric 2:	Test Substance Purity	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Reference compound reported for indirect photolysis; actinometer not specified for direct photolysis.
	Metric 4:	Test Substance Stability	Low	The test substance stability, homogeneity, preparation, and storage conditions were not reported and these factors may influence the test substance.

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Study Citation:	Real, F. J., Benitez, F. J., Rodriguez, C. (2007). Elimination of benzene and chlorobenzenes by photodegradation and ozonation processes. Chemical Engineering Communications 194(6):811-827.			
OECD Harmonized Template:	Photolysis in Water			
HERO ID:	1953447			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Low	The test method did not indicate control for other loss processes.
	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	High	This metric met the criteria for high confidence as expected for this type of study.
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	Medium	Details were omitted; however, the lack of data is not likely to hinder the interpretation of the results.
	Metric 12:	Test Substance Purity	Medium	Details were omitted; however, the lack of data is not likely to hinder the interpretation of the results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Loss due to other process were 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	Low	Analytical detail was omitted. 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	N/A	The metric is not applicable to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	The study results may be limited; loss due to other processes were not quantified and volatilization may account for loss test material.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		Medium		

Study Citation:	Selli, E., Bianchi, C. L., Pirola, C., Cappelletti, G., Ragaini, V. (2008). Efficiency of 1,4-dichlorobenzene degradation in water under photolysis, photocatalysis on TiO ₂ and sonolysis. Journal of Hazardous Materials 153(3):1136-1141.
OECD Harmonized Template:	Photolysis in Water
HERO ID:	1493526

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; EPA OTS 796.3700 (Direct Photolysis Rate in Water by Sunlight): Direct photolysis
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Aldrich; NR; >99% Notes: distilled water was used in solutions and suspensions
Duration and Test Temperature	Maximum duration: 6 hours; 30±1°C
Light Source, Intensity, and additional light details	Iron halogenide lamp; 550 and 640 W; Jelosil, models HG 200 and 500
Source Wavelength Lower and Upper	340 nm; 400 nm
Test Details and Control	Test substance added to distilled water in 500 mL cylindrical, tightly closed Pyrex vessel irradiated by external lamps; runs were conducted with continuous or intermittent stirring at ca. 220 rpm.; Not reported
Initial Concentration and Reference Compound	2.7E-4 M; 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 reported; Not reported
Indirect Rate Constant Lower and Upper	Not reported; Not reported
Method Details Results and Products	The extent of mineralization was determined using TOC analysis via Shimadzu TOC-5000A analyzer; Not reported
Details Results	
Parameter Value and Parameter Results	Not Reported; Total organic carbon
Reference Compound, Reference	Not reported; Not reported; Not reported; Not reported
Substance Results, Percent Degradation Results and Standard Deviation Results	
Results Remarks, Sample time Results, Results Details	Using the 640W lamp 60% decrease was observed after 95 minutes; using the 550W lamp 60% decrease was observed after >360 minutes; Not reported; Photolysis with 640W lamp resulted in a 77% decrease of absorbance at 223.2 nm after 6 hours; photolysis with 550W lamp resulted in a 25% decrease of absorbance at 223.2 nm after 6 hours

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 purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Low	Controls were not included.
	Metric 4:	Test Substance Stability	Medium	Test substance preparation was reported but not storage conditions.
Domain 3: Test Conditions				

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Study Citation:		Selli, E., Bianchi, C. L., Pirola, C., Cappelletti, G., Ragaini, V. (2008). Efficiency of 1,4-dichlorobenzene degradation in water under photolysis, photocatalysis on TiO ₂ and sonolysis. Journal of Hazardous Materials 153(3):1136-1141.		
OECD Harmonized Template:		Photolysis in Water		
HERO ID:		1493526		
		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	Appropriate light conditions were reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	N/A	This metric is not applicable.
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 the intended outcomes of interest.
	Metric 12:	Test Substance Purity	High	Sampling methods addressed the outcomes of interest and were frequent enough to be able to calculate rate constants.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability between study groups was discussed.
	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	Extraction efficiency was not reported, limited raw data reported, the analytical method and limit of detection were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Kinetic calculations were not included.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information on analytical methods and lack of control, evaluation of 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**

Study Citation:	Borden, R. C., Bedient, P. B. (1987). In Situ Measurement of Adsorption and Biotransformation at a Hazardous Waste Site. Water Resources Bulletin 23(4):629-636.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5251642

EXTRACTION				
Parameter		Data		
CASRN and Test Material		106-46-7; pDCB		
Confidentiality, EndPoint, Type, Guideline		None; other: Experimental; other: Guideline not reported, mineralization in groundwater		
Solvent, Reactivity, Storage, Stability		NR; NR; NR; NR		
Radiolabel, Source, State, Purity		14 C; NR; NR; NR		
Blank and Control		NR, may be reported elsewhere; NR, may be reported elsewhere		
Oxygen and Inoculum		anaerobic; natural water: Ground water collected from hazardous waste site in Conroe, Texas		
Duration, Parameter, System, and Sampling Frequency		159 hours; CO2 evolution: NR, may be reported elsewhere; 2, 63, 111, and 159 hr		
pH Adjusted and pH		Not Reported; NR, may be reported elsewhere		
Concentration		0 - 910 µg/L		
Composition and Test Temperature		Not Reported; NR, may be reported elsewhere		
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design		NR, may be reported elsewhere; NR, may be reported elsewhere; Not Reported; Experimental details reported in Lee et al. 1985		
Results Details Method, Results per Degradation Parameter, and		Gas chromatography with FID detector, samples preconcentrated with Sep-Pak C18 cartridges and extracted with methylene chloride.; % Mineralized after 24 hour incubation (14CO2 evolution); Not Reported		
Direct Quantum Yield Results				
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments		0.68, 0.52, 2.04, and 0.62; NR; 24 hours; Not Reported		
Results Remarks and Results Details		Mineralization reported for initial concentrations 0 ug/L, 910 ug/L, 450 ug/L, and 35 ug/L; 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 and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	Experimental details were reported to be available in Lee et al. 1985.
	Metric 4:	Test Substance Stability	N/A	Test substance predation may be available in L33 et al. 1985.
Domain 3: Test Conditions				
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Study Citation:	Borden, R. C., Bedient, P. B. (1987). In Situ Measurement of Adsorption and Biotransformation at a Hazardous Waste Site. Water Resources Bulletin 23(4):629-636.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	5251642			
EVALUATION				
Domain	Metric	Rating	Comments	
	Metric 5:	Test Method Suitability	N/A	Experimental details were reported to be available in Lee et al. 1985.
	Metric 6:	Testing Conditions	N/A	Experimental details were reported to be available in Lee et al. 1985.
	Metric 7:	Testing Consistency	N/A	Experimental details were reported to be available in Lee et al. 1985.
	Metric 8:	System Type and Design	N/A	Experimental details were reported to be available in Lee et al. 1985.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The test inoculum source were reported.
	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 outcomes of interest.
	Metric 12:	Test Substance Purity	N/A	Experimental details were reported to be available in Lee et al. 1985.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability between results and initial concentration, in addition to lower than expected mineralization based on disappearance rates were discussed.
	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	Analytical methods were appropriate and radiolabeled mineralization supported that the test substance was not disappearing through other mechanisms.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Not conducted
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable.
	Metric 18:	QSAR Models	N/A	Not applicable
Overall Quality Determination			High	

Study Citation:	Calamari, D., Galassi, S., Setti, F. (1982). Evaluating the hazard of organic substances on aquatic life: the paradichlorobenzene example. Ecotoxicology and Environmental Safety 6(4):369-378.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	4912296

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, EndPoint, Type, Guideline	None; ready biodegradability; Experimental; other: Similar to MITI test with deviations in inoculum and observation time
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Not reported; Aniline, 100 mg/L
Oxygen and Inoculum	aerobic; activated sludge, industrial (adaptation not specified): Treatment plant sludge
Duration, Parameter, System, and Sampling Frequency	28 days; test mat.: Sapromat flask; 0, 14, 28d
pH Adjusted and pH	Not Reported; Not reported
Concentration	8 - 40 mg/L
Composition and Test Temperature	Test system enriched with nutrients; 20°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	GC-FID with 63Ni electron capture detector; detection limit 0.002 mg/L; Dilute solutions (< 0.5 mg/L) extracted with n-hexane; Test substance disappearance; Not Reported
Direct Quantum Yield Results	
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	100% and 100% (8 mg/L), 38% and 0% (40 mg/L); Not reported; 28 days; Complete degradation
Results Remarks and Results Details	Results reported for both replicates at starting concentrations of 8 and 40 mg/L. Oxygen consumption started after day 14. Respiration for 8 mg/L test systems was 80% ThOD. Does not meet OECD definition of ready biodegradability (60% BOD, 100 mg/L initial concentration); Degradation practically 0% on days 0 and 14.
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	N/A	The test substance source and purity were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	A positive control was reported and tested valid.
	Metric 4:	Test Substance Stability	High	Test substance initial concentrations were reported.

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Study Citation:	Calamari, D., Galassi, S., Setti, F. (1982). Evaluating the hazard of organic substances on aquatic life: the paradichlorobenzene example. Ecotoxicology and Environmental Safety 6(4):369-378.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	4912296			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was appropriate for the test substance.
	Metric 6:	Testing Conditions	Medium	Nutrient enrichment not specified, pH not reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples.
	Metric 8:	System Type and Design	N/A	Not applicable.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	Inoculum source reported generally, adaptation not specified.
	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 outcomes of interest.
	Metric 12:	Test Substance Purity	Medium	Sampling methods were not described and frequency was low.
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	The analytical method was appropriate and limit of detection was reported; oxygen consumption measurement method and aqueous sample extraction efficiency were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical and kinetic calculations were not applied.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable based on the method and compared to OECD guidelines for ready biodegradation.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

* Related References: ECHA rating: 2

Study Citation:	Dermietzel, J., Vieth, A. (2002). Chloroaromatics in groundwater: chances of bioremediation. Environmental Geology 41(6):683-689.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	4908945			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
Confidentiality, EndPoint, Type, Guideline	None; other: Experimental; other: Not reported; Biodegradation in groundwater microcosm			
Solvent, Reactivity, Storage, Stability	ethanol or absorbed on silica gel; NR; NR; NR			
Radiolabel, Source, State, Purity	organic carbon metabolism monitored by using radio-labelled carbon tracer, no other details provided; 14C 1,4-DCB; NR; NR; NR			
Blank and Control	Not reported; Not reported			
Oxygen and Inoculum	aerobic; natural water: Groundwater samples collected from one contaminated site, 0.3 mg/L DCBs detected in samples			
Duration, Parameter, System, and Sampling Frequency	25 days; other: Closed flasks, pressure monitored; 14, 25 d			
pH Adjusted and pH	Not Reported; Not reported			
Concentration	6.2 mg/L			
Composition and Test Temperature	Groundwater collected from Bitterfeld (Saxony-Anhalt), diluted 5x with deionized water; groundwater chloride composition 400 - 450 mg/L; 14, 20°C			
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Biodegradation determined by Cl- release; No significant difference observed between temperatures, results reported as an average of 4 replicates (2 at each temperature)			
Results Details Method, Results per Degradation Parameter, and	GC (to detect CBs), IC (to determine chloride released); Test substance degradation (by Cl- release); Not Reported			
Direct Quantum Yield Results				
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	87.1%; Not reported; 25 days; Not reported			
Results Remarks and Results Details	Ethanol was added.Cl- release: 2.6 mg/LCorresponding CB degradation: 5.4 mg/LBased on radiochemical analysis, 2/3 of the 1,4-DCB carbon was mineralized to CO2 but only small part of tracer recovered as biomass.; 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 and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	High	Test substance vehicle and applied concentrations were reported.
Domain 3: Test Conditions				
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Study Citation:	Dermietzel, J., Vieth, A. (2002). Chloroaromatics in groundwater: chances of bioremediation. Environmental Geology 41(6):683-689.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	4908945			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	No test conditions besides temperature were reported.
	Metric 7:	Testing Consistency	High	Tests were conducted consistently 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 study types.
	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 outcomes of interest.
	Metric 12:	Test Substance Purity	Medium	Sampling addressed the outcomes of interest, little to no details on methods or sample frequency were reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Standard deviations between replicates not reported, uncertainty or variation 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	Low	No raw data reported. Limited analytical details provided, may be reported elsewhere (no percent recovery, limit of detection, limited analytical system details).
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical methods were utilized to determine significant difference in biodegradation at two temperatures but methods but not reported.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results are acceptable based on the method however limited study details were provided, and the results were not compared to findings from other studies.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		Medium		

Study Citation:	Freitag, D., Ballhorn, L., Geyer, H., Korte, F. (1985). Environmental hazard profile of organic chemicals: An experimental method for the assessment of the behaviour of organic chemicals in the ecosphere by means of simple laboratory tests with 14C labelled chemicals. Chemosphere 14(10):1589-1616.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	85251

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Not reported; biodegradation in activated sludge
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	14-C labelled; Synthesized by the study laboratory; NR; >98%
Blank and Control	Not reported; Not reported
Oxygen and Inoculum	aerobic; activated sludge, non-adapted: From municipal sewage treatment plant
Duration, Parameter, System, and Sampling Frequency	5 days; CO2 evolution: Not reported; Not reported
pH Adjusted and pH	Not Reported; Not reported
Concentration	0.05 mg/L
Composition and Test Temperature	Synthetic nutrient medium; 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	Not reported; CO2 evolution; Not Reported
Direct Quantum Yield Results	
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	< 0.1%; Not reported; 5 days; Not reported
Results Remarks and Results Details	Less than 0.1% applied test substance degraded.; 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	High	The test substance was synthesized by the study laboratory and purity was reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	Medium	Test substance starting concentration were reported, no other details on preparation or storage were provided.
Domain 3: Test Conditions				

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Study Citation:	Freitag, D., Ballhorn, L., Geyer, H., Korte, F. (1985). Environmental hazard profile of organic chemicals: An experimental method for the assessment of the behaviour of organic chemicals in the ecosphere by means of simple laboratory tests with 14C labelled chemicals. Chemosphere 14(10):1589-1616.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	85251			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Low	Limited testing conditions were reported; only activated sludge source and duration were reported.
	Metric 7:	Testing Consistency	High	Test set up was consistent across the chemicals studied.
	Metric 8:	System Type and Design	N/A	Not applicable.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	Inoculum source was reported and appropriate.
	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	Medium	Sampling methods were not reported, frequency was acceptable.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Many study details were omitted, making result interpretation difficult.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	Not applicable.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Analytical methods were not reported. Raw data was not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical and kinetic calculations were not conducted.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Limited study details were reported and results were not compared to previous studies, making verification of the plausibility of the results difficult.
	Metric 18:	QSAR Models	N/A	Not applicable.

Overall Quality Determination**Medium**

Study Citation:	Higgo, J. J. W., Nielsen, P. H., Bannon, M. P., Harrison, I., Christensen, T. H. (1996). Effect of geochemical conditions on fate of organic compounds in groundwater. Environmental Geology 27(4):335-346.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	3559691

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: laboratory column microcosms LCM Villa Farm and groundwater
Solvent, Reactivity, Storage, Stability	not reported; not reported; not reported; not reported
Radiolabel, Source, State, Purity	none; not reported; not reported; not reported
Blank and Control	sterile control 0.2% sodium azide; not reported
Oxygen and Inoculum	aerobic/anaerobic; natural water: freshwater: Groundwater collected from Villa Farm research site Coventry, England. bacterial count 1E3 to 1E4 CFU/mL
Duration, Parameter, System, and Sampling Frequency	175 days (from figure); test mat: jacketed glass chromatography columns packed with sediment; not reported
pH Adjusted and pH	Not Reported; 6.6-7.4 (from table)
Concentration	ca 300 ug/L
Composition and Test Temperature	Villa Farm sediment; 10 deg C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	not reported; none; yes; Oxygen content was >10 mg/L; groundwater was spiked with 3H2O; bacterial count <10 CFU/mL
Results Details Method, Results per Degradation Parameter, and	GC/FID/ECD; test mat.; Not Reported
Direct Quantum Yield Results	
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	slow loss: <80% lost from solution within 40 days; not reported; not reported; slow loss: <80% lost from solution within 40 days in sterilized control
Results Remarks and Results Details	control and nonsterile loss parallel: loss probably abiotic; 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 was 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.

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Study Citation:	Higgo, J. J. W., Nielsen, P. H., Bannon, M. P., Harrison, I., Christensen, T. H. (1996). Effect of geochemical conditions on fate of organic compounds in groundwater. Environmental Geology 27(4):335-346.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	3559691			
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	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.
	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 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 was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	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	Medium	Sources of variability and uncertainty in the measurements were reported in the study and the differences were considered or accounted for in data evaluation with minor deviations or omissions
	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	Medium	kinetic calculations were not clearly described
Domain 8: Other				
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Study Citation:	Higgo, J. J. W., Nielsen, P. H., Bannon, M. P., Harrison, I., Christensen, T. H. (1996). Effect of geochemical conditions on fate of organic compounds in groundwater. Environmental Geology 27(4):335-346.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	3559691

		EVALUATION		
Domain	Metric	Rating	Comments	
	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
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Study Citation:	Higgo, J. J. W., Nielsen, P. H., Bannon, M. P., Harrison, I., Christensen, T. H. (1996). Effect of geochemical conditions on fate of organic compounds in groundwater. Environmental Geology 27(4):335-346.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	3559691

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: laboratory column microcosms LCM quartz in groundwater
Solvent, Reactivity, Storage, Stability	not reported; not reported; not reported; not reported
Radiolabel, Source, State, Purity	none; not reported; not reported; not reported
Blank and Control	sterile control 0.2% sodium azide; not reported
Oxygen and Inoculum	aerobic/anaerobic; natural water: freshwater: Groundwater collected from Villa Farm research site Coventry, England. bacterial count 1E3 to 1E4 CFU/mL
Duration, Parameter, System, and Sampling Frequency	50 days (from figure); test mat: jacketed glass chromatography columns packed with quartz; not reported
pH Adjusted and pH	Not Reported; 6.6-7.4 (from table)
Concentration	ca 300 ug/L
Composition and Test Temperature	quartz that had been incubated in the dark at 10 deg C for at least a month with Villa Farm groundwater; 10 deg C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	not reported; none: aerobic until day 20; yes; Oxygen content was >10 mg/L; groundwater was spiked with 3H2O; bacterial count <10 CFU/mL
Results Details Method, Results per Degradation Parameter, and	GC/FID/ECD; test mat.; Not Reported
Direct Quantum Yield Results	
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	no loss: no significant loss; not reported; not reported; no loss: no significant loss in sterilized control
Results Remarks and Results Details	control and nonsterile loss parallel: loss probably abiotic; 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 was 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:	Higgo, J. J. W., Nielsen, P. H., Bannon, M. P., Harrison, I., Christensen, T. H. (1996). Effect of geochemical conditions on fate of organic compounds in groundwater. Environmental Geology 27(4):335-346.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	3559691			
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 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.
	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 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 was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	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	Medium	Sources of variability and uncertainty in the measurements were reported in the study and the differences were considered or accounted for in data evaluation with minor deviations or omissions.
	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	Medium	kinetic calculations were not clearly described
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.

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Study Citation:	Higgo, J. J. W., Nielsen, P. H., Bannon, M. P., Harrison, I., Christensen, T. H. (1996). Effect of geochemical conditions on fate of organic compounds in groundwater. Environmental Geology 27(4):335-346.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	3559691

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Determination		Medium	

Study Citation:	Kondo, M., Nishihara, T., Shimamoto, T., Koshikawa, T., Itio, T., Sawamura, R., Tanaka, K. (1988). [Biodegradation test of chemicals by cultivation methods]. Eisei Kagaku / Journal of Hygienic Chemistry 34(2):188-195.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1333626

EXTRACTION	
Parameter	Data
CASRN and Test Material	not reported; Not Reported
Confidentiality, EndPoint, Type, Guideline	No; screening test; experimental; other: cultivation method in river and seawater
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR
Blank and Control	NR; NR
Oxygen and Inoculum	not specified (likely aerobic); natural water: River water from Mino River; sea water from Akashi Beach
Duration, Parameter, System, and Sampling Frequency	3 days; Not Reported; Not Reported; Not Reported
pH Adjusted and pH	Not Reported; Not Reported
Concentration	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	Not Reported; not specified; Not Reported
Direct Quantum Yield Results	
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	0% (river water) 0% (sea water); not reported; 3 days; not specified; however, 170 chemicals evaluated including aniline
Results Remarks and Results Details	judgement of degradability: hard; 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.
	Metric 2:	Test Substance Purity	Medium	Unclear due to foreign language.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Unclear due to foreign language.
	Metric 4:	Test Substance Stability	Medium	Unclear due to foreign language.
Domain 3: Test Conditions				

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Study Citation:	Kondo, M., Nishihara, T., Shimamoto, T., Koshikawa, T., Itio, T., Sawamura, R., Tanaka, K. (1988). [Biodegradation test of chemicals by cultivation methods]. Eisei Kagaku / Journal of Hygienic Chemistry 34(2):188-195.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	1333626			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	High	Target chemical concentration appropriate.
	Metric 6:	Testing Conditions	Medium	Unclear due to foreign language.
	Metric 7:	Testing Consistency	Medium	Unclear due to foreign language.
	Metric 8:	System Type and Design	Medium	Unclear due to foreign language.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	Unclear due to foreign language.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	Unclear due to foreign language.
	Metric 12:	Test Substance Purity	Medium	Unclear due to foreign language.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Unclear due to foreign language.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Unclear due to foreign language.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Unclear due to foreign language.
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.
Overall Quality Determination			Medium	

Study Citation:	Monsanto Industrial Chem Co, (1976). Biodegradability of process and related chemicals.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	4929993

EXTRACTION	
Parameter	Data
CASRN and Test Material	not reported; p-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	Details are crossed out; Ultimate and primary biodegradation; experimental; other: Thompson-Duthie-Sturm Procedure and modified SCAS test methods are cited
Solvent, Reactivity, Storage, Stability	SCAS ethanol; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; SCAS ethanol solution; NR Notes: NR
Blank and Control	Controls included; not reported
Oxygen and Inoculum	aerobic; Not Reported: activated sludge (SCAS); acclimated bacterial seed (Thompson-Duthie-Sturm and Monsanto Shake Flask)
Duration, Parameter, System, and Sampling Frequency	28-35 days; CO2 evolution: Erlenmeyer flasks; test bottles; not reported
pH Adjusted and pH	not reported; not reported
Concentration	>= 15 - <= 120 mg
Composition and Test Temperature	not specified; 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	Flame ionization GC; CO2 evolution; not reported
Direct Quantum Yield Results	
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	not reported; not reported; not reported; not reported
Results Remarks and Results Details	All results for this chemical were redacted.; 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
	Metric 2:	Test Substance Purity	Low
The test substance was identified Detail regarding this metric were omitted.			
Domain 2: Test Design	Metric 3:	Study Controls	High
	Metric 4:	Test Substance Stability	Medium
Controls included. Detail regarding this metric were omitted.			
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:	Monsanto Industrial Chem Co, (1976). Biodegradability of process and related chemicals.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	4929993			
Domain		Metric	EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Medium	Test conditions were reported.
	Metric 7:	Testing Consistency	High	Testing was consistent across study groups.
	Metric 8:	System Type and Design	High	Appropriate methods were used.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	Inoculum reported are routinely used for similar study types.
	Metric 10:	Sampling Methods	N/A	Not applicable to this study.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Uninformative	Detail regarding this metric were omitted for target chemical.
	Metric 12:	Test Substance Purity	High	Inoculum reported are routinely used for similar study types.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Uninformative	Detail regarding this metric were omitted for target chemical.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	Not applicable to this study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Uninformative	Detail regarding this metric were omitted for target chemical.
	Metric 16:	Statistical Methods and Kinetic Calculations	Uninformative	Detail regarding this metric were omitted for target chemical.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Uninformative	Detail regarding this metric were omitted for target chemical.
	Metric 18:	QSAR Models	N/A	Not applicable to the study.
Overall Quality Determination			Uninformative	

Study Citation:	Naziruddin, M., Grady, C. P. L., Jr, Tabak, H. H. (1995). Determination of biodegradation kinetics of volatile organic compounds through the use of respirometry. Water Environment Research 67(2):151-158.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	4931835

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: enriched degradation
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; NR; NR; NR Notes: 1,4-DCB
Blank and Control	not reported; toxicity study included
Oxygen and Inoculum	aerobic; activated sludge, adapted: The acclimated bacteria were enriched in batch reactors with at least four transfers in batch culture to ensure that at least 99% of the bacteria were capable of biodegradation of 1,4-DCB.
Duration, Parameter, System, and Sampling Frequency	not reported; O ₂ consumption: Continuous stirred tank reactors; not reported
pH Adjusted and pH	no; not reported
Concentration	31.2 mg/L
Composition and Test Temperature	nutrient solution at twice the concentration recommended by OECD (1981).; 25°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	not reported; not reported; yes; Not Reported
Results Details Method, Results per Degradation Parameter, and	electrolytic respirometry; O ₂ consumption; not reported
Direct Quantum Yield Results	
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	not reported; not reported; not reported; kinetic parameters compared to other studies.
Results Remarks and Results Details	microbial growth rate=0.053±0.006/hr; inhibition coefficient=2.69±0.70 mg/L as COD; decay coefficient=0.008±0.006/hr; biomass yield=0.39±0.01; product yield=0.05±0.02; residual sum of squares error=2.2±1.6; 5 day lag phase
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 and purity were not reported; however, the omissions or identified impurities were not likely to have a substantial impact on the study results.
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 result.

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Study Citation:	Naziruddin, M., Grady, C. P. L., Jr, Tabak, H. H. (1995). Determination of biodegradation kinetics of volatile organic compounds through the use of respirometry. Water Environment Research 67(2):151-158.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	4931835			
Domain	Metric	EVALUATION		Comments
		Rating		
	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	Medium	The test method was suitable for the test substance with minor deviations; however, these deviations or omissions were not likely to have a substantial impact on study results.
	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	Medium	Some test conditions across samples or study groups were not reported, but these discrepancies were not likely to have a substantial impact on study results.
	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	Low	An inoculum that was pre-adapted to the test substance was used for a biodegradation rate 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	There was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	Metric 12:	Test Substance Purity	Medium	Details regarding sampling methods of the outcome(s) were not fully reported; however, the limitations were not likely to have a substantial impact on results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variables were identified and discussed.
	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(s).
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Study Citation:	Naziruddin, M., Grady, C. P. L., Jr, Tabak, H. H. (1995). Determination of biodegradation kinetics of volatile organic compounds through the use of respirometry. Water Environment Research 67(2):151-158.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	4931835

Domain		Metric		EVALUATION Rating		Comments
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
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Study Citation:	Nielsen, P. H., Bjerg, P. L., Nielsen, P., Smith, P., Christensen, T. H. (1996). In situ and laboratory determined first-order degradation rate constants of specific organic compounds in an aerobic aquifer. Environmental Science & Technology 30(1):31-37.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1486742

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; analytical grade
Blank and Control	biologically deactivated control; Not reported
Oxygen and Inoculum	aerobic; natural water: freshwater: microorganisms from the ground water
Duration, Parameter, System, and Sampling Frequency	3 months; test mat.: In Situ Microcosms; 7 days
pH Adjusted and pH	Not Reported; Not reported
Concentration	ca. 150 - µg/L
Composition and Test Temperature	Cylinder open at bottom, screened at top. Installed in the aquifer through a borehole approx. 5 m below ground surface.; Not reported
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Yes; Not reported; Not Reported
Results Details Method, Results per Degradation Parameter, and	Carlo Erba gas chromatograph equipped with FID and ECD; Not reported; Not Reported
Direct Quantum Yield Results	
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	Not reported; Not reported; Not reported; Not reported
Results Remarks and Results Details	lag phase 22 days; first-order degradation constant: k=0.05/day
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 chemical name.
	Metric 2:	Test Substance Purity	High	The test substance purity was reported; all organics were analytical grade.
Domain 2: Test Design	Metric 3:	Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 4:	Test Substance Stability	N/A	Not applicable; this study was an in situ experiment.
Domain 3: Test Conditions				

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Study Citation:	Nielsen, P. H., Bjerg, P. L., Nielsen, P., Smith, P., Christensen, T. H. (1996). In situ and laboratory determined first-order degradation rate constants of specific organic compounds in an aerobic aquifer. Environmental Science & Technology 30(1):31-37.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	1486742			
Domain		Metric	EVALUATION Rating	Comments
	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	Low	Some testing conditions were not reported (such as temperature of the microcosm and pH); however, sufficient data were reported to determine that the omissions were not likely to have had a substantial impact on the study results.
	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	Some system details were omitted but these omissions were unlikely to have impacted the study results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for 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	LOD was not specified, but this omission should not have affected the results.
	Metric 12:	Test Substance Purity	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	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	High	This metric met the criteria for high confidence as expected for this type of study.
	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:	Schraa, G., Van Der Meer, JR, Van Neerven ARW, Colberg, P. J., Zehnder AJB (1986). Microbial transformation of micropollutants in soil systems. FEMS Symposium No. 33 (0):315-326.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	1441620

EXTRACTION				
Parameter		Data		
CASRN and Test Material		106-46-7; 1,4-DCB		
Confidentiality, EndPoint, Type, Guideline		None; screening test; Experimental; other: Non-guideline biodegradation study		
Solvent, Reactivity, Storage, Stability		NR; NR; NR; NR		
Radiolabel, Source, State, Purity		NR; NR; NR; NR		
Blank and Control		Not reported; Not applicable		
Oxygen and Inoculum		aerobic; natural water: groundwater aquifer material and water saturated soil		
Duration, Parameter, System, and Sampling Frequency		50 days; test mat.: Not Reported; Not reported		
pH Adjusted and pH		Not Reported; Not Reported		
Concentration		0.23 - 40 µg/L		
Composition and Test Temperature		Not Reported; 25°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		Not reported; Loss of test substance; Not Reported		
Direct Quantum Yield Results				
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments		Not Reported; degradation rate constant: 0.36/day in water saturated soil and 20 per day in percolation column with aquifer material; Not Reported; Not reported		
Results Remarks and Results Details		It's not clear if this is the primary source of these results.; Not reported		
Results Mean Total Recovery and Results per Recovery		Yes; 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	Low	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	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:	Schraa, G., Van Der Meer, JR, Van Neerven ARW, Colberg, P. J., Zehnder AJB (1986). Microbial transformation of micropollutants in soil systems. FEMS Symposium No. 33 (0):315-326.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	1441620			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Low	The test method was suitable for the test substance with minor deviations.
	Metric 6:	Testing Conditions	High	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	Low	Limited detail regarding this metric.
	Metric 8:	System Type and Design	Medium	Limited detail regarding this metric.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Low	The test organism, species, or inoculum source were not reported in detail for all replicates.
	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	Deficiencies in the outcome assessment reporting were likely to have a substantial impact on results.
	Metric 12:	Test Substance Purity	Low	Details regarding sampling methods of the outcomes were not fully reported, and the omissions were likely to have a substantial impact on study 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	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 and extraction efficiency were reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Limited detail regarding this metric.
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			Low	

* Related References: Same as HERO 1441620

Study Citation:	Tabak, H. H., Quave, S. A., Mashni, C. I., Barth, E. F. (1981). Biodegradability studies with organic priority pollutant compounds. Journal of Water Pollution Control Federation 53(10):1503-1518.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	9861

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Biodegradation in domestic wastewater, static-culture flask-screening
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Blank and Control	Synthetic medium containing 5mg yeast extract; Not reported
Oxygen and Inoculum	aerobic; sewage, domestic, non-adapted: Weekly "subcultures" involved adding fresh test samples to existing cultures to test for inoculum adaptation.
Duration, Parameter, System, and Sampling Frequency	28 days (includes 7 day static incubation and 3 weekly subcultures); test mat.: Static-culture in 250 mL Erlenmeyer flask.; Days 7, 14, 21, and 28
pH Adjusted and pH	Not Reported; Not reported
Concentration	5 - 10 mg/L
Composition and Test Temperature	BOD dilution water with 5 mg/L yeast extract; 25°C
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; yes; Homogenous suspensions of the test substance in the chilled synthetic medium were prepared in a heavy duty blender for 2 minutes. Replicate studies with 5 mg/L and 10 mg/L substrate.
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	GC and TOC determinations. GC LOD: 0.1 mg/L; Average loss of test substance after 7 days; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	16-61% (at 5 mg/L); 0-54% (at 10 mg/L); Not reported; 7 days; Not reported
Results Remarks and Results Details	Significant degradation with gradual adaptation followed by toxicity in subcultures; 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	N/A	The test substance purity was not reported; however, the omission is unlikely to have an impact on the study results.
Domain 2: Test Design	Metric 3:	Study Controls	High	Appropriate blanks were used without inoculum and without substrate.
	Metric 4:	Test Substance Stability	High	The test substance preparation and storage conditions were reported and appropriate.

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Study Citation:	Tabak, H. H., Quave, S. A., Mashni, C. I., Barth, E. F. (1981). Biodegradability studies with organic priority pollutant compounds. Journal of Water Pollution Control Federation 53(10):1503-1518.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	9861			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Low	The test substance was tested above its aqueous solubility which may have had an impact on the study results.
	Metric 6:	Testing Conditions	High	The testing conditions were reported and appropriate.
	Metric 7:	Testing Consistency	High	The testing conditions were consistent 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	N/A	The inoculum type was reported and appropriate for 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 the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	The sampling methods were reported and appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Sources of uncertainty were not reported which may impact 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 appropriate, percentage removal of the test substance was reported, and the analytical method was suitable.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not reported; however, the omission is unlikely to have a substantial impact on the study results.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.
Overall Quality Determination		High		

Study Citation:	Topping, B. (1987). The biodegradability of para-dichlorobenzene and its behavior in model activated-sludge plants. Water Research 21(3):295-300.
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	4908964

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, EndPoint, Type, Guideline	None; ready biodegradability; Experimental; OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	1,4-Dichloro[U-14C] benzene; BDH chemicals (nonradiolabelled); ex Amersham (radiolabeled); NR; 97% minimum assay (nonradiolabelled), 99% (radiochemical purity)
Blank and Control	Not reported; Sodium benzoate
Oxygen and Inoculum	aerobic; activated sludge (adaptation not specified): Not reported
Duration, Parameter, System, and Sampling Frequency	28 days; O2 consumption: Closed bottle test; 5, 8, 15, 28d
pH Adjusted and pH	Not Reported; Not reported
Concentration	1.9 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	HPLC; aqueous samples extracted with pentane; samples with high suspended solids were extracted by a gas stripping procedure, with the substance collected onto activated charcoal, eluted with CS2, and pentane and dodecane in pentane were added; Mineralization; Not Reported
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	67%; Not reported; 28 days; 75.4% mineralization, the test was valid
Results Remarks and Results Details	HPLC showed >99% test substance breakdown in 28d. Test substance is readily biodegradable.; % Oxygen consumed: 1.4%/5 d, 1.4%/5 d, 49.5%/ 15 d, 67%/28 d
Results Mean Total Recovery and Results per Recovery	> 80%; 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 test substance source and purity were reported.
Domain 2: Test Design			
Metric 3:	Study Controls	Medium	Water control was included, the results were not reported.
Metric 4:	Test Substance Stability	High	Test substance preparation and stability was reported, there were losses during preparation but the flow rate was not increased.

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Study Citation:	Topping, B. (1987). The biodegradability of para-dichlorobenzene and its behavior in model activated-sludge plants. Water Research 21(3):295-300.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	4908964			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was appropriate for the test substance.
	Metric 6:	Testing Conditions	High	Temperature, aeration rates, and sludge retention times were reported.
	Metric 7:	Testing Consistency	High	Test method was applied consistently 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 generally.
	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 outcomes of interest.
	Metric 12:	Test Substance Purity	High	Sampling methods addressed the outcomes of interest and sampling was conducted at an acceptable frequency.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability was addressed by statistical techniques between samples.
	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 method was appropriate, extraction recovery was reported. HPLC analysis confirmed the loss of the parent to biodegradation.
	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	High	The study results were reasonable based on the method.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

* Related References: ECHA rating: 2

Study Citation:	Topping, B. (1987). The biodegradability of para-dichlorobenzene and its behavior in model activated-sludge plants. Water Research 21(3):295-300.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	4908964			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
Confidentiality, EndPoint, Type, Guideline	None; inherent biodegradability; Experimental; other: Not reported; Modified porous pot activated sludge test (HMSO 1981)			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	1,4-Dichloro[U-14C] benzene; BDH chemicals (nonradiolabelled); ex Amersham (radiolabeled); NR; 97% minimum assay (nonradiolabelled), 99% (radiochemical purity)			
Blank and Control	Control dosed with water; Not reported			
Oxygen and Inoculum	aerobic; activated sludge (adaptation not specified): Primary settled sewage			
Duration, Parameter, System, and Sampling Frequency	161 days; 41 days acclimation,; Not Reported: Modified porous pot: plastic outer vessel and base, porous polypropylene liner, primary sewage and test substance inlet feed at top, charcoal trap at top, effluent at side, air supply inlet and waste sludge effluent at bottom; Daily for 7 days after acclimation period			
pH Adjusted and pH	Not Reported; Not reported			
Concentration	0.42±0.14 mg/L			
Composition and Test Temperature	Not reported; 20±2°C (acclimation period), 15°C (until 127 d), 8°C			
CEC, Water Aeration Dilution, Continuous Darkness, and Other Design	Not reported; Not reported; Not Reported; Test substance dosed directly into activated sludge nominal concentration of 20 mg/L at 0.5±0.1 mL/min; sewage retention time 6 h; sludge retention time 6 d, 3d after 104 d operation			
Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results	HPLC; aqueous samples extracted with pentane; samples with high suspended solids were extracted by a gas stripping procedure, with the test substance collected onto activated charcoal, eluted with CS2, and pentane and dodecane in pentane were added; Not reported; Not Reported			
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	98%; ± 4%; Not applicable; Not reported			
Results Remarks and Results Details	Little to no test substance detected in waste sludge.Removal for 6 d sludge retention time:Study days 42 - 50 (20°C 1.0 L/min air flow): 99±1% removal, 28±8% in airStudy days 54 - 55 (15°C 0.6-1.0 L/min air flow): 95±5% removal, 7±6% in airStudy days 153 – 161 (8°C, 1.0 L/min airflow): 100% removal, 19±6% in airRemoval for 3 d sludge retention time:Study days 110 - 134 (15°C 1.0 L/min air flow): 100% removal, 22±2% in airStudy days 138 - 141 (15 - 8°C 0.6-1.0 L/min air flow): 100% removal, 29±4% in airStudy days 145 - 161 (8°C, 1.0 L/min airflow): 96±3% removal, 63±4% in air; Not reported			
Results Mean Total Recovery and Results per Recovery	>> 80%; 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 test substance source and purity were reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Positive controls were included and tested valid.
	Metric 4:	Test Substance Stability	Medium	Test substance preparation and stability were not reported.
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Study Citation:	Topping, B. (1987). The biodegradability of para-dichlorobenzene and its behavior in model activated-sludge plants. Water Research 21(3):295-300.			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	4908964			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The study was conducted according to OECD guidelines.
	Metric 6:	Testing Conditions	Medium	Limited testing conditions were reported, however the study was conducted according to OECD guidelines, the omitted information is not expected to impact study results.
	Metric 7:	Testing Consistency	High	Test method was applied consistently across study groups.
	Metric 8:	System Type and Design	N/A	Not applicable.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	The inoculum source was not reported, however the study is conducted according to OECD guidelines and therefore this omitted information is not expected to impact study results.
	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 outcomes of interest.
	Metric 12:	Test Substance Purity	High	Sampling methods addressed the outcomes of interest and sampling was conducted at an acceptable frequency.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	A negative control was not included, however uncertainty in test substance loss was accounted for by HPLC analysis.
	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 method was appropriate, extraction recovery was reported. HPLC analysis confirmed the loss of the parent to biodegradation.
	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	High	Although the study omits many details on the study method, it was conducted according to OECD guidelines, and the results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

* Related References: ECHA rating: 2

Study Citation:	U.S. EPA, (2009). Initial risk-based prioritization of high production volume (HPV) chemicals: Chlorobenzenes category: Sponsored chemicals: Monochlorobenzene (CASRN 108-90-7) (CA Index Name: Benzene, chloro-); 1,2-Dichlorobenzene (CASRN 95-50-1) (CA Index Name: Benzene, 1,2-dichloro-); 1,3-Dichlorobenzene (CASRN 541-73-1) (CA Index Name: Benzene, 1,3-dichloro-); 1,2,3-Trichlorobenzene (CASRN 87-61-6) (CA Index Name: Benzene, 1,2,3-trichloro-).
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5113349

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	no; ready biodegradability; experimental; OECD Guideline 301 C (Ready Biodegradability: Modified MITI Test (I)): MITI test
Solvent, Reactivity, Storage, Stability	Not Reported; Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, Purity	Not Reported; Not Reported; Not Reported; Not Reported
Blank and Control	Not Reported; Not Reported
Oxygen and Inoculum	Not Reported; Not Reported
Duration, Parameter, System, and Sampling Frequency	28 days; 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	Not Reported; Not Reported; Not Reported
Direct Quantum Yield Results	
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	0%; Not Reported; 28 days; 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 definitively (i.e., established nomenclature, CASRN, or structure reported, including information on the specific form tested [particle characteristics for solid-state materials, salt or base, valence state, isomer, etc.] for materials that may vary in form, or submitting company's code name with supporting confirmatory documentation) and the specific form characterized, where applicable.

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Study Citation:	U.S. EPA, (2009). Initial risk-based prioritization of high production volume (HPV) chemicals: Chlorobenzenes category: Sponsored chemicals: Monochlorobenzene (CASRN 108-90-7) (CA Index Name: Benzene, chloro-); 1,2-Dichlorobenzene (CASRN 95-50-1) (CA Index Name: Benzene, 1,2-dichloro-); 1,3-Dichlorobenzene (CASRN 541-73-1) (CA Index Name: Benzene, 1,3-dichloro-); 1,2,3-Trichlorobenzene (CASRN 87-61-6) (CA Index Name: Benzene, 1,2,3-trichloro-).			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	5113349			
		EVALUATION		
Domain		Metric	Rating	Comments
	Metric 2:	Test Substance Purity	Medium	The test substance source was not reported and the test substance purity was low or not reported (e.g., lack of information on hydration state of a compound introduces uncertainty into concentration calculations); however, the omissions or identified impurities were not likely to have a substantial impact on the study results.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Some concurrent control group details were not included; however, more study details expected to be in the primary source.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, more study details expected to be in the primary source.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	Study details not reported but expected to be appropriate. More details expected in the primary source.
	Metric 6:	Testing Conditions	Medium	Testing conditions not reported but expected to be appropriate. More details expected in the primary source.
	Metric 7:	Testing Consistency	Medium	Testing conditions not reported but expected to be consistent. More details expected in the primary source.
	Metric 8:	System Type and Design	Medium	The system type and design were not reported but expected to be appropriate. More details expected in the primary source.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	The test organism, species, or inoculum source were not reported but expected to be appropriate. More details expected in the primary source.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	No methodology was reported but more data expected to be in the primary source.
	Metric 12:	Test Substance Purity	Medium	no sampling method reported but expected to be appropriate. More details expected in the primary source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	More details expected to be available in the primary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric does not apply to this study type.
Domain 7: Data Presentation and Analysis				
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Study Citation:	U.S. EPA, (2009). Initial risk-based prioritization of high production volume (HPV) chemicals: Chlorobenzenes category: Sponsored chemicals: Monochlorobenzene (CASRN 108-90-7) (CA Index Name: Benzene, chloro-); 1,2-Dichlorobenzene (CASRN 95-50-1) (CA Index Name: Benzene, 1,2-dichloro-); 1,3-Dichlorobenzene (CASRN 541-73-1) (CA Index Name: Benzene, 1,3-dichloro-); 1,2,3-Trichlorobenzene (CASRN 87-61-6) (CA Index Name: Benzene, 1,2,3-trichloro-).			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	5113349			
EVALUATION				
Domain		Metric	Rating	Comments
	Metric 15:	Data Reporting	Medium	No analytical method reported but expected to be appropriate. More details expected to be in the primary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results were reasonable.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.

Overall Quality Determination**Medium**

* Related References: cited from Synthetic Organic Chemical Manufacturers Association (SOCMA) Chlorobenzene Producers Association (CPA). March 31, 2003. Revised Robust Summary and Test Plan for Chlorobenzenes Category Data can also be found https://www.nite.go.jp/chem/jcheck//template.action?ano=2778&mno=3-41&cno=106-46-7&request_locale=en

Study Citation:	U.S. EPA, (2009). Initial risk-based prioritization of high production volume (HPV) chemicals: Chlorobenzenes category: Sponsored chemicals: Monochlorobenzene (CASRN 108-90-7) (CA Index Name: Benzene, chloro-); 1,2-Dichlorobenzene (CASRN 95-50-1) (CA Index Name: Benzene, 1,2-dichloro-); 1,3-Dichlorobenzene (CASRN 541-73-1) (CA Index Name: Benzene, 1,3-dichloro-); 1,2,3-Trichlorobenzene (CASRN 87-61-6) (CA Index Name: Benzene, 1,2,3-trichloro-).
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5113349

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	no; ready biodegradability; experimental; OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test): OECD 301 D: Closed Bottle Test
Solvent, Reactivity, Storage, Stability	Not Reported; Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, Purity	Not Reported; Not Reported; Not Reported; Not Reported
Blank and Control	Not Reported; Not Reported
Oxygen and Inoculum	Not Reported; Not Reported: acclimated cultures
Duration, Parameter, System, and Sampling Frequency	20 days; 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	Not Reported; Not Reported; Not Reported
Direct Quantum Yield Results	
Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments	20%; Not Reported; 20 days; 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 definitively (i.e., established nomenclature, CASRN, or structure reported, including information on the specific form tested [particle characteristics for solid-state materials, salt or base, valence state, isomer, etc.] for materials that may vary in form, or submitting company's code name with supporting confirmatory documentation) and the specific form characterized, where applicable.
	Metric 2:	Test Substance Purity	Medium	The test substance source was not reported and the test substance purity was low or not reported (e.g., lack of information on hydration state of a compound introduces uncertainty into concentration calculations); however, the omissions or identified impurities were not likely to have a substantial impact on the study results.

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Study Citation:	U.S. EPA, (2009). Initial risk-based prioritization of high production volume (HPV) chemicals: Chlorobenzenes category: Sponsored chemicals: Monochlorobenzene (CASRN 108-90-7) (CA Index Name: Benzene, chloro-); 1,2-Dichlorobenzene (CASRN 95-50-1) (CA Index Name: Benzene, 1,2-dichloro-); 1,3-Dichlorobenzene (CASRN 541-73-1) (CA Index Name: Benzene, 1,3-dichloro-); 1,2,3-Trichlorobenzene (CASRN 87-61-6) (CA Index Name: Benzene, 1,2,3-trichloro-).			
OECD Harmonized Template:	Biodegradation in Water			
HERO ID:	5113349			
Domain		EVALUATION		Comments
		Metric	Rating	
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Some concurrent control group details were not included; however, more study details expected to be in the primary source.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, more study details expected to be in the primary source.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	Study details not reported but expected to be appropriate. More details expected in the primary source.
	Metric 6:	Testing Conditions	Medium	Testing conditions not reported but expected to be appropriate. More details expected in the primary source.
	Metric 7:	Testing Consistency	Medium	Testing conditions not reported but expected to be consistent. More details expected in the primary source.
	Metric 8:	System Type and Design	Medium	The system type and design were not reported but expected to be appropriate. More details expected in the primary source.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	The test organism, species, or inoculum source were not reported but expected to be appropriate. More details expected in the primary source.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to the study.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	No methodology was reported but more data expected to be in the primary source.
	Metric 12:	Test Substance Purity	Medium	No sampling method reported but expected to be appropriate. More details expected in the primary source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	More details expected to be available in the primary source.
	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	Medium	No analytical method reported but expected to be appropriate. More details expected to be in the primary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.

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Study Citation:	U.S. EPA, (2009). Initial risk-based prioritization of high production volume (HPV) chemicals: Chlorobenzenes category: Sponsored chemicals: Monochlorobenzene (CASRN 108-90-7) (CA Index Name: Benzene, chloro-); 1,2-Dichlorobenzene (CASRN 95-50-1) (CA Index Name: Benzene, 1,2-dichloro-); 1,3-Dichlorobenzene (CASRN 541-73-1) (CA Index Name: Benzene, 1,3-dichloro-); 1,2,3-Trichlorobenzene (CASRN 87-61-6) (CA Index Name: Benzene, 1,2,3-trichloro-).
OECD Harmonized Template:	Biodegradation in Water
HERO ID:	5113349

		EVALUATION		
Domain	Metric	Rating		Comments
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results were reasonable.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.

Overall Quality Determination

Medium

* Related References: cited from Synthetic Organic Chemical Manufacturers Association (SOCMA) Chlorobenzene Producers Association (CPA). March 31, 2003. Revised Robust Summary and Test Plan for Chlorobenzenes CategoryData can also be found <https://echa.europa.eu/registration-dossier/-/registered-dossier/14821/5/3/2/?documentUUID=bf4e3288-bca3-46de-a3a6-b19ecc620c3e>

Study Citation:	Bosma, T. N. P., Van Der Meer, J. R., Schraa, G., Tros, M. E., Zehnder, A. J. B. (1988). Reductive dechlorination of all trichloro- and dichlorobenzene isomers. FEMS Microbiology Letters 53(3):223-229.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	5248427

EXTRACTION

Parameter	Data
CASRN and Test Material	not reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	No; other; experimental; other: Column study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Merck, Darmstadt; NR; analytical grade; used without purification Notes: NR
Oxygen and Inoculum	anaerobic; natural sediment: Sediment column was acclimated to a mixture of tetra- and trichloroethene, 1,2,3-, 1,2,4- and 1,3,5-trichlorobenzene, 1,2-, 1,3- and 1,4-dichlorobenzene, hexachlorobutadiene, and 1,2-dichloro-4-nitrobenzene concentrations of each ranged from 30-50 nmol/L; concentrations of only trichlorobenzenes were raised on day 250 to 300-500 nmol/L.
Duration, Parameter, System, and Sampling Frequency	300 days continuous operation (lag-phase 2-6 months); test mat.; Wet-packed column with anaerobic sediment and mineral medium prepared in Milli-Q water, Na2S or nitrate added as reducing agent.; not specified
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	periodically; not specified; anaerobic sediment from the river Rhine near Wageningen, The Netherlands; anaerobic mineral medium in purified water; not reported; not reported
Control Dark, Control, and Blank Concentration	not reported; not reported; no elimination observed in sterile sediment batch experiments >= 30 - <= 50 nmol/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC with ECD and HPLC for monochlorobenzene analysis; dichlorobenzenes identified by mass spectrum and retention timesand; test mat.
Results Remarks	1,4-DCB was formed from 1,2,4-trichlorobenzene degradation in the column; degradation of 1,2,4-trichlorobenzene resulted in approximately 30% formation of 1,4-DCB in the first 0-5 cm of the column. Concentrations of 1,4-DCB appeared to remain stable through the column (5-25cm) after 300 days. Concentrations of total-DCB appeared to decline with increasing concentrations of monochlorobenzene through the column (5-25cm) after 520 days.
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	not reported; 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	not reported; not reported; monochlorobenzene from reductive halogenation

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
	Metric 1:	Test Substance Identity	High
	Metric 2:	Test Substance Purity	High
The test substance was identified. Source and purity were reported.			
Domain 2: Test Design			

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Study Citation:		Bosma, T. N. P., Van Der Meer, J. R., Schraa, G., Tros, M. E., Zehnder, A. J. B. (1988). Reductive dechlorination of all trichloro- and dichlorobenzene isomers. FEMS Microbiology Letters 53(3):223-229.		
OECD Harmonized Template:		Biodegradation in Sediment		
HERO ID:		5248427		
Domain	Metric	EVALUATION Rating		Comments
	Metric 3:	Study Controls	Uninformative	No 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	Low	Applied target chemical concentrations were not specific.
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions.
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this study type.
	Metric 8:	System Type and Design	High	The system type and design was reported.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	Column was acclimated prior to investigation.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this type of study.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Uninformative	The assessment methodology did not address or report the outcome of interest; target chemical was a transformation product evaluated in degradation of trichlorobenzene.
	Metric 12:	Test Substance Purity	Low	No details reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Uninformative	Concentrations specific to the target chemical and its transformation products were not reported; analytical detail not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Uninformative	Outcome of interest not reported.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study.

Overall Quality Determination**Uninformative**

Study Citation:	Clover, C. C., Jackson, W., Pardue, J. H. (1998). Natural attenuation of mono- and dichlorobenzenes in anaerobic surface sediments at the petro processors site. :75.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	5252376

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; Not Reported
Confidentiality, EndPoint, Type, Guideline	No; Not Reported; Experimental; other: Non-guideline
Solvent, Reactivity, Storage, Stability	Not reported; Not reported; Not reported; Not reported
Radiolabel, Source, State, Purity	Not reported; Not reported; Not reported; Not reported
Oxygen and Inoculum	Anaerobic; natural sediment: freshwater: Sediment was obtained from a dichlorobenzene contaminated stream bed at Petro Processors (PPI) Superfund site.
Duration, Parameter, System, and Sampling Frequency	5 weeks; Test material; 125mL incubation bottles with 100g slurry containing sediment, deaerated pore water from the site, and 10mg DCB/kg sediment.; Approximately every 4 days
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	Not reported; Not reported; Not reported; Not reported; Not reported; Not reported
Control Dark, Control, and Blank Concentration	Not reported; Not reported; Not reported
Analytical Method, Analytical Details, and Results Per Degredation Parameter	>= 10mg/kg sediment - GC-MS; GC-MS using selected ion monitoring; Test material concentration
Results Remarks	Not Reported
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	12.4 days; Not reported; Not reported; Not reported
Results Details	First order reaction rate: 0.056 days ⁻¹
Mean Total Recovery Results and Results Per Recovery	Not reported; Not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	Approximately 100% disappearance after 5 weeks.; Not reported; Methane production measured with GC-FID peaked at approximately the same time DCB concentrations decreased (around day 20).

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	High	The test substance purity was not reported; however, it was detected using appropriate analytical means.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not reported; however, the omission is unlikely to have a substantial impact on the study results.

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Study Citation:	Clover, C. C., Jackson, W., Pardue, J. H. (1998). Natural attenuation of mono- and dichlorobenzenes in anaerobic surface sediments at the petro processors site. :75.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	5252376			
Domain	Metric	EVALUATION		Comments
	Metric 4:	Test Substance Stability	Medium	Some details regarding the test substance preparation and storage conditions were not reported; however, the omission is unlikely to have a substantial 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	Low	Some of the testing conditions were not reported which may have an impact on the study results.
	Metric 7:	Testing Consistency	Medium	Some testing conditions were not reported across the study groups; however, this unlikely to have a substantial impact on the study results.
	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	Some details regarding the inoculum type were not reported; however, the omissions are unlikely to have a substantial impact on the study results.
	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 were reported and appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Sources of uncertainty in the measurements were not reported; however, the omission is unlikely to have a 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	Low	Some analytical method details, such as extraction efficiency, were not reported which may have an impact on the study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were reported and appropriate.
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 the study type.

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Study Citation:	Clover, C. C., Jackson, W., Pardue, J. H. (1998). Natural attenuation of mono- and dichlorobenzenes in anaerobic surface sediments at the petro processors site. :75.		
OECD Harmonized Template:	Biodegradation in Sediment		
HERO ID:	5252376		
Domain		EVALUATION	Comments
Metric		Rating	
Overall Quality Determination		Medium	

Study Citation:	Dermietzel, J., Vieth, A. (2002). Chloroaromatics in groundwater: chances of bioremediation. Environmental Geology 41(6):683-689.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	4908945			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Not reported; field column study, biodegradation in aquifer material			
Solvent, Reactivity, Storage, Stability	NA; NR; NR; NR			
Radiolabel, Source, State, Purity	NA; Contaminated groundwater from Bitterfeld aquifer (Saxony-Anhalt); Liquid; NA			
Oxygen and Inoculum	aerobic/anaerobic; natural water / sediment: Samples collected from contaminated aquifer site in Bitterfeld (Saxony-Anhalt)			
Duration, Parameter, System, and Sampling Frequency	18 mo (9 anaerobic, 9 aerobic); test mat.; Groundwater pumped into stainless steel column packed with aquifer material; Weekly			
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	Not reported; Headspace; Sand and gravel from contaminated groundwater (16 - 19 m); Contaminated groundwater from well (20 - 21 m); Not reported; Not reported			
Control Dark, Control, and Blank Concentration	Not Reported; Not reported; Not reported			
Analytical Method, Analytical Details, and Results Per Degredation Parameter	Not reported			
Results Remarks	Gas chromatography; Not reported; 7			
Halfife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	Multiple chlorinated benzenes might be naturally attenuated by anaerobic dechlorination.Stationary state established after 6 weeks in anaerobic conditions, outflow/inflow ratio remained at 0.747After creating aerobic conditions, test substance outflow was removed below detection limit after 2 wks.			
Results Details	Not reported; Not reported; Not reported; Not reported			
Mean Total Recovery Results and Results Per Recovery	Not reported			
Results Value, Direct Quantum Yield Results, and Transformation Products	Not reported; Not reported			
25.3% estimated from Fig 4 - 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 name.	
Metric 2:	Test Substance Purity	High	The field sample source was reported.	
Domain 2: Test Design				
Metric 3:	Study Controls	Medium	Controls were not explicitly included.	
Metric 4:	Test Substance Stability	Medium	Sample preparation details were not reported.	
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Study Citation:	Dermietzel, J., Vieth, A. (2002). Chloroaromatics in groundwater: chances of bioremediation. Environmental Geology 41(6):683-689.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	4908945			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6:	Testing Conditions	Low	No test conditions, including water and sediment characteristics, were reported.
	Metric 7:	Testing Consistency	High	Tests were conducted consistently across samples and 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 and is used for similar study types.
	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	Medium	Sampling addressed the outcomes of interest, little to no details on methods or sample frequency were reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variation reported graphically, uncertainty 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	Low	No raw data reported. Limited analytical details provided, may be reported elsewhere (no percent recovery, limit of detection, limited analytical system details).
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Linear regression analysis applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results are acceptable based on the method however limited study details were provided, and the results were not compared to findings from other studies.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			Medium	

Study Citation:	Jackson, W., Pardue, J. H. (1999). Natural attenuation case study for chlorobenzenes in a forested wetland. n/a:9.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	5276512

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, EndPoint, Type, Guideline	None; inherent biodegradability; Experimental; other: Guideline not specified; Natural Attenuation in a wetland
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Oxygen and Inoculum	anaerobic; natural water / sediment: Devil's Swamp floodplain streambed sediments: collected from industrial waste disposal facility site near Baton Rouge, Louisiana
Duration, Parameter, System, and Sampling Frequency	5 wk; test mat.; 100 g slurry added to 30 x 125 mL incubation bottles in anerobic glove box; Every 3-4 days
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	5 wk; Not reported; Not Reported; Not Reported; Not reported; Not reported
Control Dark, Control, and Blank Concentration	Not Reported; Not reported; Not reported
Analytical Method, Analytical Details, and Results Per Degredation Parameter	10 mg/kg
Results Remarks	GC-MS (test substance concentration); GC-FID (methane production); GC-MS using selected ion monitoring; 7
Half-life, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	Completely degraded within 5 weeks. Degradation occurred under methanogenic conditions. At least partial dechlorination to MCB occurred to before ring cleavage. Mass balance for this conversion was not achieved, though. Ca. 50% of DCBs were converted to MCB.
Results Details	Not reported; Not reported; Not reported; Not reported
Mean Total Recovery Results and Results Per Recovery	First order rate constant: 0.056 / d ($R^2=0.77$)
Results Value, Direct Quantum Yield Results, and Transformation Products	Not reported; Not reported
	100%; Not Reported; Monochlorobenzene

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	A concurrent control was not reported.
	Metric 4: Test Substance Stability	Medium	Minimal details on test substance preparation or sample storage conditions were reported.

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Study Citation:	Jackson, W., Pardue, J. H. (1999). Natural attenuation case study for chlorobenzenes in a forested wetland. n/a:9.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	5276512			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Temperature, pH, other sediment parameters were not reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
	Metric 8:	System Type and Design	High	Test method was suitable.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	Inoculum source was reported and is routinely used for similar study types.
	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	The sampling methods addressed the outcomes of interest and are widely accepted approaches.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability between samples was addressed by statistical techniques.
	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	Target chemical concentrations and a transformation product was reported, mass balance and extraction efficiency were not reported, it is not clear if sorption was differentiated from biodegradation in test substance loss.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical and kinetic calculations were applied appropriately.
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:	Kirk, P. W. W., Rogers, H. R., Lester, J. N. (1989). Fate of chlorobenzenes and permethrins during anaerobic sewage sludge digestion. Chemosphere 18(9):1771-1784.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	2298564

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Anaerobic biodegradation of 1,4-dichlorobenzene in digested sludge.
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Aldrich Chemical Co. (Gillingham, UK); NR; NR
Oxygen and Inoculum	anaerobic; digested sludge: Sludge was collected from Hogsmill Valley WPCW (Thames Water Authority, UK). 2.8% total solids.
Duration, Parameter, System, and Sampling Frequency	32 days; test mat.; Closed system with oxygen free nitrogen headspace.; Not reported
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	Not reported; Not reported; Samples received 50mg/L sodium acetate and 25mg/L sodium propionate.; Not reported; Not reported; Not reported
Control Dark, Control, and Blank Concentration	Not Reported; Azide treated controls were used to determine abiotic losses.; Not reported 710 µg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	Gas chromatography-electron capture detection.; Perkin Elmer 8420 capillary gas chromatograph (Beaconsfield, UK).; 7
Results Remarks	Paired t-test between untreated and azide treated samples showed a significant difference; therefore it appears that biodegradation occurred.
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	8-16 days.; Not reported; Not reported; Not reported
Results Details	Not reported
Mean Total Recovery Results and Results Per Recovery	Not reported; 54±15%
Results Value, Direct Quantum Yield Results, and Transformation Products	Approximately 80% removal was observed in the untreated samples; azide treated samples only had 10% removal.; 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; however, the omission is unlikely to have an impact on the study results.
Domain 2: Test Design	Metric 3:	Study Controls	High	Appropriate controls were used.
	Metric 4:	Test Substance Stability	High	The test substance preparation and homogeneity were reported and appropriate.

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Study Citation:	Kirk, P. W. W., Rogers, H. R., Lester, J. N. (1989). Fate of chlorobenzenes and permethrins during anaerobic sewage sludge digestion. Chemosphere 18(9):1771-1784.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	2298564			
		EVALUATION		
Domain	Metric	Rating	Comments	
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable and the test substance was tested below its aqueous solubility.
	Metric 6:	Testing Conditions	High	The testing conditions were reported and appropriate.
	Metric 7:	Testing Consistency	High	There were no reported deviations in 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	Medium	Some of the details regarding the inoculum were not reported; however, the omissions are unlikely to have a substantial impact on the study results.
	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 sampling methods were reported and appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability in the recoveries were reported and acceptable.
	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 analytical method was suitable and recoveries were reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	The statistical analysis was appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

* Related References: ECHA rating: 2

Study Citation:	Kuhn, E. P., Colberg, P. J., Schnoor, J. L., Wanner, O., Zehnder A, J. B., Schwarzenbach, R. P. (1985). Microbial transformations of substituted benzenes during infiltration of river water to groundwater laboratory column studies. Environmental Science & Technology 19(10):961-968.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	4931552

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-DCB
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Not reported; biodegradation in column studies
Solvent, Reactivity, Storage, Stability	Double distilled water; NR; 4°C in a flask; Stored up to 2 months without significant losses
Radiolabel, Source, State, Purity	NA; Fluka, Buchs, Switzerland; Liquid; 99%
Oxygen and Inoculum	aerobic/anaerobic; natural sediment: 2% clay, 2 - 5 mg/g organic carbon
Duration, Parameter, System, and Sampling Frequency	9 mo (aerobic), 3 mo (anaerobic); test mat.; Borosilicate glass column with sampling ports at 1.5, 4.7, and 9.1 cm from inlet (column 1), Plexiglas column with sampling port at 2.7 cm from inlet, with 19 additional ports placed at 5 cm intervals (column 2); Approx. 1, 2, 3, 4, 9, 17 d, 9 mo (aerobic), 1, 3, 4 d, 3 mo (anaerobic)
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	Approx. 17 d (aerobic), 3 mo. (anaerobic); Influent, port, and effluent; Aquifer material from interface of river/groundwater infiltration site; Synthetic river water with added nutrients (0.68 mM Na+, 0.13 mM K+, 0.62mM Mg+2, 0.26 mM N03-, 0.03 mM HP04-2, 0.21 mMS04-2, and 1.34 mM Cl-); Not reported; 8.3±0.3 (water)
Control Dark, Control, and Blank Concentration	yes; Not reported; Not reported 0.2 - 0.4 µM
Analytical Method, Analytical Details, and Results Per Degredation Parameter	High-performance capillary gas chromatography; RSD±10%; Concentrated by closed-loop stripping technique of Grob and Zurcher; 7
Results Remarks	80% of the aerobic removal occurred within the first 4.7 cm of the column. Increase in removal overtime indicate that the bacterial population grew and/or had acclimated to the test substance
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	Not reported; Not reported; Not reported; Not reported
Results Details	First order rate constant for DCBs: 0.5 - 1 / dAerobic effluent concentration/influent concentration: Approx. 0.1 / 1d, 0.3 / 2 d, 0.45 / 3 d, 0.6 / 4 d, 0.5 / 9 d, 0.8 / 17 d
Mean Total Recovery Results and Results Per Recovery	Not reported; Not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	> 90% (aerobic), negligible (anaerobic); 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 test substance source and purity was reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not explicitly included.

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Study Citation:	Kuhn, E. P., Colberg, P. J., Schnoor, J. L., Wanner, O., Zehnder A, J. B., Schwarzenbach, R. P. (1985). Microbial transformations of substituted benzenes during infiltration of river water to groundwater laboratory column studies. Environmental Science & Technology 19(10):961-968.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	4931552			
Domain		EVALUATION		Comments
	Metric	Rating		
	Metric 4:	Test Substance Stability	High	Test substance preparation and stock solution stability was 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	Temperature, pH, synthetic river water composition, and some sediment characteristics were reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups and 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 inoculum source was reported with minimal detail but this is not likely to have impacted study results.
	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	The outcome assessment methodology showed the increased biodegradation of the test substance at constant input, not an overall biodegradation rate.
	Metric 12:	Test Substance Purity	Medium	Sampling methods were only on the influent and effluent; collection methods were acceptable but other removal pathways cannot be defined based on this method.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variation between replicates was not accounted for; analytical method relative variation was around 10%.
	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	Data only reported graphically and for one column, extraction efficiency not reported, limits of detection not reported. Analytical method non-standard and low detail. Insufficient evidence to confirm biodegradation as the removal pathway reported, sorption not considered.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Kinetic calculations consulted but low detail and not isomer specific.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were comparable to the field study however method overall was low in detail and sorption removal was not accounted for.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

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Study Citation:	Kuhn, E. P., Colberg, P. J., Schnoor, J. L., Wanner, O., Zehnder A, J. B., Schwarzenbach, R. P. (1985). Microbial transformations of substituted benzenes during infiltration of river water to groundwater laboratory column studies. Environmental Science & Technology 19(10):961-968.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	4931552

Domain	Metric	EVALUATION Rating	Comments
Overall Quality Determination		Medium	

* Related References: ECHA rating: 2

Study Citation:	Luo, J., Kurt, Z., Hou, D., Spain, J. C. (2015). Modeling aerobic biodegradation in the capillary fringe. Environmental Science & Technology 49(3):1501-1510.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	4912116

EXTRACTION	
Parameter	Data
CASRN and Test Material	not reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	No; other; Calculation (biodegradation model); other: Aerobic Biodegradation Model: biodegradation kinetics with diffusive transport processes
Solvent, Reactivity, Storage, Stability	NA; NA; NA; NA
Radiolabel, Source, State, Purity	NA; NA; NA; NA Notes: NA
Oxygen and Inoculum	aerobic; oxygen input from surface; natural sediment: freshwater: Previously conducted field column used for developing modeled data was inoculated with a suspension of CB-, 1,2DCB-, and 1,4DCB-degrading bacteria.
Duration, Parameter, System, and Sampling Frequency	Not applicable; test mat.; Based on previously conducted column studies; model includes oxygen-, substrate-, and biomass-dependent biodegradation kinetics along with diffusive transport processes. The column contained subsurface sediments from a field site. Anoxic water containing CB, 1,2-DCB, and 1,4-DCB was continuously pumped through the bottom of the column, while filtered atmospheric air was pumped into the top. Contaminant transport assumed to be one-dimensional (vertical) transport in the capillary fringe (10 cm above water table) and unsaturated zone with steady-state soil moisture distributions.; Not applicable
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	Not applicable; Not applicable; Not applicable; yes; model assumed biodegradation reactions occur only in the liquid phase; Not applicable; Not applicable
Control Dark, Control, and Blank	yes; Not applicable; Abiotic control. Modeled abiotic contaminant concentrations in a field sediment column 0 to ca. 25 cm above the water table under abiotic conditions - 1,4-dichlorobenzene (values estimated from line graph): decreased from ca. 0.5 mg/L at 0 cm to > 0.1 mg/L at 25 cm; measured concentrations from previous study: 0.5 mg/L (0 cm), 0.25 mg/L (10 cm), 0.1 mg/L (20 cm) and >0.01 mg/L (25 cm).
Concentration	ca. 0.5 - ca. 1.25 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	reactive transport model; Parameters for reactive transport modeling: microbial max growth rate, monod constant, yield coefficient, decay coefficient, conversion factor, diffusion coefficient in air and water, HLC; test material
Results Remarks	Modeled contaminant concentrations in a field sediment column 0 to ca. 25 cm above the water table under biotic conditions in which microbial biomass peak concentrations (10 ⁵ mg/L) are at ca. 7cm above the water table - 1,4-dichlorobenzene: decreased from ca. 1.25 mg/L at 0 cm to > 0.01 mg/L at 5 to 25 cm (values estimated from line graph).
Half-life, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	not reported; not reported; not reported; not reported
Results Details	not reported
Mean Total Recovery Results and Results Per Recovery	not applicable; not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	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

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Study Citation:	Luo, J., Kurt, Z., Hou, D., Spain, J. C. (2015). Modeling aerobic biodegradation in the capillary fringe. Environmental Science & Technology 49(3):1501-1510.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	4912116			
EVALUATION				
Domain		Metric	Rating	Comments
	Metric 2:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Abiotic model was included.
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	N/A	The metric is not applicable to this study type.
	Metric 6:	Testing Conditions	Medium	Limited detail on environmental conditions used for model.
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this study type.
	Metric 8:	System Type and Design	High	Steady state assumptions were described.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	Biodegradation modeled based on results from inoculum specifically chosen based on its capacity to degrade chlorobenzenes.
	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	Biodegradation rate not reported.
	Metric 12:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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	Biodegradation kinetics and diffusive transport processes not specifically reported for target chemical.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Model calculations were outlined.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	Reported values were within expected range as defined by reference substance(s)
	Metric 18:	QSAR Models	High	Model endpoint clearly defined.

Overall Quality Determination**High**

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Study Citation:	Luo, J., Kurt, Z., Hou, D., Spain, J. C. (2015). Modeling aerobic biodegradation in the capillary fringe. Environmental Science & Technology 49(3):1501-1510.		
OECD Harmonized Template:	Biodegradation in Sediment		
HERO ID:	4912116		
		EVALUATION	
Domain	Metric	Rating	Comments

Study Citation:	Masunaga, S., Susarla, S., Yonezawa, Y. (1996). Dechlorination of chlorobenzenes in anaerobic estuarine sediment. Water Science and Technology 33(6):173-180.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	660279

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Dechlorination in anaerobic sediment
Solvent, Reactivity, Storage, Stability	Methanol; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Tokyo Kasei Kogyo Co Ltd. Japan; NR; Purity not reported; used without purification
Oxygen and Inoculum	anaerobic; natural water / sediment: Sediment: collected in 1992 from mouth of Tsurumi river, black in color, macrobenthic organisms present; sediment passed through 2 mm sieve. River water from just above bottom of surface was used to make sediment slurry
Duration, Parameter, System, and Sampling Frequency	1 yr; test mat.; Test tubes were placed in an anaerobic chamber (10% hydrogen, 10% carbon dioxide, 80% nitrogen); sampled once a day at the beginning and then at intervals as the experiment proceeded
Results Sample Time, Compartment, Sludge Compartment, Water	Not reported; Not reported; Sediment: NaCl, sulfate, nitrate concentrations=1.7%, 1.98E+3 mg/L, below LOD, respectively; River water: NaCl, sulfate, nitrate concentrations=1.5%, 1.84E+3 mg/L, 4.0 mg/L, respectively; Not reported; 5.6
Compartment, CEC, and pH	
Control Dark, Control, and Blank	Not reported; Not reported; 8 tubes autoclaved
Concentration	4E-6 mol/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-MS; quantification using selected ion monitoring method; results corrected by recovery rate based on standard; recovery rates for all CBs tested ranged from 40-90%; 7
Results Remarks	Not reported
Half-life, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	385.1 days; Not reported; Sterile control; first order rate constant in autoclaved sediment=0.0009/day
Results Details	first order rate constant in sediment=0.0018/day
Mean Total Recovery Results and Results Per Recovery	Not reported; Not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	Not reported; Not Reported; intermediate detected: monochlorobenzene (50%)

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	Medium	The test substance source was reported; purity was omitted and the sample was used without further purification.
Domain 2: Test Design	Metric 3:	Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 4:	Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.

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Study Citation:	Masunaga, S., Susarla, S., Yonezawa, Y. (1996). Dechlorination of chlorobenzenes in anaerobic estuarine sediment. Water Science and Technology 33(6):173-180.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	660279			
Domain	Metric	EVALUATION		Comments
		Rating		
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 minor omissions in testing conditions (dark/light conditions); however, sufficient data were reported to determine that the omissions were not likely to have had a substantial impact on the study results.
	Metric 7:	Testing Consistency	Medium	Replicate test tubes used, results not reported, variation or consistency not reported.
	Metric 8:	System Type and Design	High	The system was appropriate.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	Microbial activity was not reported or characterized; however, it is indicated based on the experimental disappearance rates compared against autoclaved sediment samples.
	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	Some sampling details were omitted but this was unlikely to impact the study results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	The results were adjusted for recovery loss.
	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 of analytical results limited; does not hinder interpretation of results.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study type.
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		

* Related References: HSDB

Study Citation:	Nielsen, P. H., Christensen, T. H. (1994). Variability of biological degradation of aromatic hydrocarbons in an aerobic aquifer determined by laboratory batch experiments. <i>Journal of Contaminant Hydrology</i> 15(4):305-320.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1482449

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Laboratory batch microcosm with sediment and groundwater from a shallow unconfined, glaciofluvial sandy aquifer near Vejen City, Jutland, Denmark
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Oxygen and Inoculum	aerobic; natural sediment: sediment from glaciofluvial sandy aquifer near Vejen City, Jutland, Denmark
Duration, Parameter, System, and Sampling Frequency	Up to 149 days; DCB lag phase: 4.9±3.3 days (range 0-7); degradation stopped after 82 days; test mat.; 2.5L glass bottles with glass valves; 24 sample times
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	Not reported; Not Reported; suspended clay and silt particles (>80% sand, max. 1% clay and silt); aerobic aquifer; Not reported; 4.6-6.1
Control Dark, Control, and Blank Concentration	yes; Not reported; Two microcosms sterilized with 250 mg/L formaldehyde 120 µg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-MS; Not reported; 7
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	Not reported
Mean Total Recovery Results and Results Per Recovery	Not reported; Not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	78.3±5.9 (range 75-78); ca. 80%/149 days; Not Reported; Not reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
Metric 1:	Test Substance Identity	High	Test substance was identified clearly.
Metric 2:	Test Substance Purity	Low	Source and purity not reported.
Domain 2: Test Design			
Metric 3:	Study Controls	High	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.

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Study Citation:	Nielsen, P. H., Christensen, T. H. (1994). Variability of biological degradation of aromatic hydrocarbons in an aerobic aquifer determined by laboratory batch experiments. Journal of Contaminant Hydrology 15(4):305-320.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	1482449			
Domain	Metric	EVALUATION		Comments
		Rating		
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 reported deviations or omissions in testing conditions temperatures); 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.
	Metric 8:	System Type and Design	High	The system type and design were appropriate.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	Inoculum source was reported; microbial activity was not assessed/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 the intended outcome of interest.
	Metric 12:	Test Substance Purity	Medium	Limited details were reported regarding this metric.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	No confounding variables were identified.
	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 were reported regarding this metric.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical analysis was reported.
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		High		

Study Citation:	Qiao, W., Luo, F., Lomheim, L., Mack, E. E., Ye, S., Wu, J., Edwards, E. A. (2018). Natural attenuation and anaerobic benzene detoxification processes at a chlorobenzene-contaminated industrial site inferred from field investigations and microcosm studies. Environmental Science & Technology 52(1):22-31.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	4272187

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: laboratory microcosm study using chlorobenzene mixture.
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; Sigma-Aldrich; NR; $\geq 99\%$ Notes: 1,4-DCB
Oxygen and Inoculum	anaerobic; natural sediment: freshwater: Contaminated sediment thought to have the highest dechlorinating activity from former chemical plant in China.
Duration, Parameter, System, and Sampling Frequency	5 years; test mat.; Chlorobenzene mixture containing 1,2,4-TCB, 1,2-DCB, 1,3-DCB, 1,4-DCB and MCB; bottles containing ~15 mL sediment and 165 mL groundwater; 4 treatments: 1) sterile controls (Bottles 1-4); 2) in-situ conditions (Bottles 5-8); 3) electron donor amended treatment (Bottles 9-12); and 4) a benzene only treatment (Bottles 13-16); room temperature; 10% microcosm transfer plus 1,4-DCB in acetone at day 817.; not reported
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	when appropriate.; not reported; contaminated sediment collected July 2014 from a depth of 1.5-2 m below surface.; groundwater collected at a point off the contaminated site July 2014.; not reported; 6.64 (water)
Control Dark, Control, and Blank Concentration	yes; not reported; Sterile control spiked with mercuric chloride and sodium azide. 11 - 14 uM
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-FID; 87-105% mass balance (from supplemental); test mat.
Results Remarks	Dechlorination of 1,4-DCB was observed on day 706 in one treatment after supplementation with mineral medium. Subsequent dechlorination of 1,4-DCB was also observed after 10% microcosm transfer and addition of 1,4-DCB in acetone on day 817.
Half-life, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	not applicable; not applicable; not applicable; Not Reported
Results Details	1,4-DCB dechlorination was nutrient- or vitamin-limited.
Mean Total Recovery Results and Results Per Recovery	72% $\pm$ 5% (from supplemental); No change was noted in CB concentration in control samples over the course of 1 year.
Results Value, Direct Quantum Yield Results, and Transformation Products	85-95% (from figure); not reported; monochlorobenzene (from figure)

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	Concurrent controls were included.

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Study Citation:		Qiao, W., Luo, F., Lomheim, L., Mack, E. E., Ye, S., Wu, J., Edwards, E. A. (2018). Natural attenuation and anaerobic benzene detoxification processes at a chlorobenzene-contaminated industrial site inferred from field investigations and microcosm studies. Environmental Science & Technology 52(1):22-31.		
OECD Harmonized Template:		Biodegradation in Sediment		
HERO ID:		4272187		
		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	Medium	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 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	Low	Deficiencies in the outcome assessment methodology of the assessment or reporting were likely to have a substantial impact on results.
	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	Sources of variability and uncertainty in the measurements, and statistical techniques were considered and accounted for in data evaluation 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	High	The target chemical and transformation product(s) 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(s).
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.

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Study Citation:	Qiao, W., Luo, F., Lomheim, L., Mack, E. E., Ye, S., Wu, J., Edwards, E. A. (2018). Natural attenuation and anaerobic benzene detoxification processes at a chlorobenzene-contaminated industrial site inferred from field investigations and microcosm studies. Environmental Science & Technology 52(1):22-31.		
OECD Harmonized Template:	Biodegradation in Sediment		
HERO ID:	4272187		
Domain	Metric	EVALUATION Rating	Comments
Overall Quality Determination		High	

Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	1467139			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene			
Confidentiality, EndPoint, Type, Guideline	No; other; experimental; other: anaerobic degradation in sediment slurry			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	None; NR; NR; NR Notes: None			
Oxygen and Inoculum	anaerobic; natural sediment: freshwater: near shore 3" and 2" diameter sediment cores from Onondaga Lake, Syracuse, NY			
Duration, Parameter, System, and Sampling Frequency	600 days; test mat; 12 deg C incubation; amber bottles with 5% (w/v) wet sediment in artificial pore water; periodically			
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	NR; natural sediment/artificial pore water; coarse-grained, sandy, organic carbon fraction of 0.8-2.6%; artificial pore water: NaCl, Na2SO4, CaCl2, NH4Cl, MgCl2, KCl, K2HPO4; NR; 6.8			
Control Dark, Control, and Blank Concentration	yes; NR; sterile control: autoclaved at 15 psi and 130 deg C for 60 min on three consecutive days ca .2 mg			
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-FID; NR; test mat			
Results Remarks	none			
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	NR; NR; NR; NR			
Results Details	physical mechanism such as volatile loss, was not observed			
Mean Total Recovery Results and Results Per Recovery	NR; NR			
Results Value, Direct Quantum Yield Results, and Transformation Products	<50%; 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	The test substance source was not reported; however, the omissions or identified impurities were not likely to have a substantial impact on the study results.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Concurrent controls were included.
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Study Citation:		Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.		
OECD Harmonized Template:		Biodegradation in Sediment		
HERO ID:		1467139		
Domain	Metric	EVALUATION		Comments
		Rating		
	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 and study groups
	Metric 8:	System Type and Design	High	The system type and design were appropriate
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	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	Medium	There was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results
	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	N/A	The metric is not applicable to this study type
	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 metric is not applicable to this study type.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculation methods were not clearly described
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**NEED TO FIX**

Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1467139

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: anaerobic degradation in sediment slurry
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; NR; NR; NR Notes: 1,4-D
Oxygen and Inoculum	anaerobic; natural sediment: off shore 3" and 2" diameter sediment core from Onondaga Lake, Syracuse, NY
Duration, Parameter, System, and Sampling Frequency	600 days; test mat; 12 deg C incubation temperature; amber bottles with 5% (w/v) wet sediment in artificial pore water; periodically
Results Sample Time, Compartment, Sludge Compartment, Water	not reported; natural sediment/artificial pore water; fine-grained, highly cohesive, organic carbon fraction of 3.0-5.9%; artificial pore water: NaCl, CaCl ₂ , NH ₄ Cl, MgCl ₂ , KCl, K ₂ HPO ₄ ; not reported; 7.4
Compartment, CEC, and pH	
Control Dark, Control, and Blank Concentration	yes; not reported; sterile control: autoclaved at 15 psi and 130 deg C for 60 min on three consecutive days ca 0.2 mg
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-FID; not reported; test mat
Results Remarks	Not Reported
Half-life, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	not reported; not reported; not reported; not reported
Results Details	physical mechanism such as volatile loss, was not observed
Mean Total Recovery Results and Results Per Recovery	not reported; not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	<50%; 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; however, the omissions or identified impurities were not likely to have a substantial impact on the study results.
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.

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Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	1467139			
Domain	Metric	EVALUATION		Comments
		Rating		
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	The system type and design were appropriate.
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	Medium	there was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	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	N/A	The metric is not applicable to this study type.
	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	Medium	kinetic calculations were not clearly described
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			High	

Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1467139

EXTRACTION

Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: anaerobic degradation in sediment slurry
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; NR; NR; NR Notes: 1,4-D
Oxygen and Inoculum	anaerobic; natural sediment: near shore 3" and 2" diameter sediment core from Onondaga Lake, Syracuse, NY
Duration, Parameter, System, and Sampling Frequency	600 days; test mat; 12 deg C incubation temperature; amber bottles with 5% (w/v) wet sediment in artificial pore water; periodically
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	not reported; natural sediment/artificial pore water; coarse-grained, sandy, organic carbon fraction of 0.8-2.6%; artificial pore water: NaCl, Na2SO4, CaCl2, NH4Cl, MgCl2, KCl, K2HPO4; not reported; 6.8
Control Dark, Control, and Blank Concentration	yes; not reported; sterile control: autoclaved at 15 psi and 130 deg C for 60 min on three consecutive days ca 0.2 mg
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-FID; not reported; test mat
Results Remarks	Not Reported
Half-life, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	not reported; not reported; not reported; not reported
Results Details	physical mechanism such as volatile loss, was not observed
Mean Total Recovery Results and Results Per Recovery	not reported; not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	<50%; 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; however, the omissions or identified impurities were not likely to have a substantial impact on the study results.
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.

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Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	1467139			
Domain	Metric	EVALUATION		Comments
		Rating		
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	The system type and design were appropriate.
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	Medium	There was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	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	N/A	The metric is not applicable to this study type.
	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	Medium	kinetic calculations were not clearly described
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			High	

Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1467139

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: anaerobic degradation in sediment slurry
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; NR; NR; NR Notes: 1,4-D
Oxygen and Inoculum	anaerobic; natural sediment: off shore 3" and 2" diameter sediment core from Onondaga Lake, Syracuse, NY
Duration, Parameter, System, and Sampling Frequency	600 days; test mat; 12 deg C incubation temperature; amber bottles with 5% (w/v) wet sediment in artificial pore water; periodically
Results Sample Time, Compartment, Sludge Compartment, Water	not reported; natural sediment/artificial pore water; fine-grained, highly cohesive, organic carbon fraction of 3.0-5.9%; artificial pore water: NaCl, Na2SO4, CaCl2, NH4Cl, MgCl2, KCl, K2HPO4; not reported; 6.8
Compartment, CEC, and pH	
Control Dark, Control, and Blank Concentration	yes; not reported; sterile control: autoclaved at 15 psi and 130 deg C for 60 min on three consecutive days ca 0.2 mg
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-FID; not reported; test mat
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	physical mechanism such as volatile loss, was not observed
Mean Total Recovery Results and Results Per Recovery	not reported; not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	<50%; 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; however, the omissions or identified impurities were not likely to have a substantial impact on the study results.
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.

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Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	1467139			
Domain	Metric	EVALUATION		Comments
		Rating		
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	The system type and design were appropriate.
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	Medium	there was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	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	N/A	The metric is not applicable to this study type.
	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	Medium	kinetic calculations were not clearly described
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			High	

Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1467139

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: anaerobic degradation in sediment slurry
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; NR; NR; NR Notes: 1,4-D
Oxygen and Inoculum	anaerobic; natural sediment: near shore 3" and 2" diameter sediment core from Onondaga Lake, Syracuse, NY
Duration, Parameter, System, and Sampling Frequency	600 days; test mat; 12 deg C incubation temperature; amber bottles with 5% (w/v) wet sediment in artificial pore water; periodically
Results Sample Time, Compartment, Sludge Compartment, Water	not reported; natural sediment/artificial pore water; coarse-grained, sandy, organic carbon fraction of 0.8-2.6%; artificial pore water: NaCl, CaCl ₂ , NH ₄ Cl, MgCl ₂ , KCl, K ₂ HPO ₄ ; not reported; 7.4
Compartment, CEC, and pH	
Control Dark, Control, and Blank Concentration	yes; not reported; sterile control: autoclaved at 15 psi and 130 deg C for 60 min on three consecutive days ca 0.2 mg
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-FID; not reported; test mat
Results Remarks	Not Reported
Half-life, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	not reported; not reported; not reported; not reported
Results Details	physical mechanism such as volatile loss, was not observed
Mean Total Recovery Results and Results Per Recovery	not reported; not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	>50%; 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; however, the omissions or identified impurities were not likely to have a substantial impact on the study results.
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.

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Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	1467139			
Domain	Metric	EVALUATION		Comments
		Rating		
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	The system type and design were appropriate.
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	Medium	there was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	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	N/A	The metric is not applicable to this study type.
	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	Medium	kinetic calculations were not clearly described
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			High	

Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1467139

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: anaerobic degradation in sediment slurry
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; NR; NR; NR Notes: 1,4-D
Oxygen and Inoculum	anaerobic; natural sediment: near shore 3" and 2" diameter sediment core from Onondaga Lake, Syracuse, NY
Duration, Parameter, System, and Sampling Frequency	600 days; test mat; 12 deg C incubation temperature; amber bottles with 5% (w/v) wet sediment in artificial pore water; periodically
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	not reported; natural sediment/artificial pore water; coarse-grained, sandy, organic carbon fraction of 0.8-2.6%; artificial pore water: NaCl, Na2SO4, CaCl2, NH4Cl, MgCl2, KCl, K2HPO4; not reported; 6.8
Control Dark, Control, and Blank Concentration	yes; not reported; sterile control: autoclaved at 15 psi and 130 deg C for 60 min on three consecutive days ca 0.2 mg
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-FID; not reported; test mat
Results Remarks	Not Reported
Half-life, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	not reported; not reported; not reported; not reported
Results Details	physical mechanism such as volatile loss, was not observed
Mean Total Recovery Results and Results Per Recovery	not reported; not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	<50%; 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; however, the omissions or identified impurities were not likely to have a substantial impact on the study results.
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.

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Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	1467139			
Domain	Metric	EVALUATION		Comments
		Rating		
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	The system type and design were appropriate.
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	Medium	there was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	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	N/A	The metric is not applicable to this study type.
	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	Medium	kinetic calculations were not clearly described
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			High	

Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1467139

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: anaerobic degradation in sediment slurry
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; NR; NR; NR Notes: 1,4-D
Oxygen and Inoculum	anaerobic; natural sediment: near shore 3" sediment core from Onondaga Lake, Syracuse, NY
Duration, Parameter, System, and Sampling Frequency	600 days; test mat; 12 deg C incubation temperature; amber bottles with 5% (w/v) wet sediment in artificial pore water; periodically
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	not reported; natural sediment/artificial pore water; fine-grained, highly cohesive, organic carbon fraction of 3.0-5.9%; artificial pore water: NaCl, CaCl ₂ , NH ₄ Cl, MgCl ₂ , KCl, K ₂ HPO ₄ ; not reported; 7.4
Control Dark, Control, and Blank Concentration	yes; not reported; sterile control: autoclaved at 15 psi and 130 deg C for 60 min on three consecutive days ca 0.2 mg
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-FID; not reported; test mat
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	physical mechanism such as volatile loss, was not observed
Mean Total Recovery Results and Results Per Recovery	not reported; not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	>50%; 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; however, the omissions or identified impurities were not likely to have a substantial impact on the study results.
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.

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Study Citation:	Smith, A. M., Kirisits, M. J., Reible, D. D. (2012). Assessment of potential anaerobic biotransformation of organic pollutants in sediment caps. New Biotechnology 30(1):80-87.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	1467139			
Domain	Metric	EVALUATION		Comments
		Rating		
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	The system type and design were appropriate.
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	Medium	there was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	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	N/A	The metric is not applicable to this study type.
	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	Medium	kinetic calculations were not clearly described
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			High	

Study Citation:	Susarla, S., Masunaga, S., Yonezawa, Y. (1996). Biotransformation of halogenated benzenes in anaerobic sediments. Environmental Science and Pollution Research 3(2):71-74.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	1969905

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; monochlorobenzene
Confidentiality, EndPoint, Type, Guideline	none; other: transformation product; experimental; other
Solvent, Reactivity, Storage, Stability	methanol; Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, Purity	Not Reported; Tokyo Kasei Kogyo Co. Ltd. (TCI), Tokyo, Japan; Not Reported; NR; used without further purification Notes: degradation product of target chemical
Oxygen and Inoculum	anaerobic; natural sediment: freshwater: sediment collected from a industrial contaminated river bed at the mouth of the Tsurumi river
Duration, Parameter, System, and Sampling Frequency	1 year; test mat.; sealed test tube place in anaerobic chamber; not specified
Results Sample Time, Compartment, Sludge Compartment, Water	not specified; not specified; Sediment interstitial water samples with 1.7% NaCl; River water sampled just above sediment samples with 1.5% NaCl; not reported; sediment slurry pH 5.6
Compartment, CEC, and pH	
Control Dark, Control, and Blank	not reported; not reported; Autoclaved sterile controls included
Concentration	4E-6 mole/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-MS; detection limit: 1E-8 mole/L; d-naphthalene used as internal standard; disappearance of test mat.
Results Remarks	1,4-dichlorobenzene was not a reported test substance in this paper; composition profile for contaminated river water/sediment was not reported
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	138 days; r-squared = 0.93; not reported; not reported
Results Details	first-order rate constant: 0.0050±0.007/day
Mean Total Recovery Results and Results Per Recovery	Method recovery rates for all analytes ranged from 50-99%; not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	not reported; not reported; not detected; possible intermediate, benzene, not monitored

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	The source of the test substance was reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	Appropriate control was included.
	Metric 4:	Test Substance Stability	High	The test substance preparation and storage conditions were reported.

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Study Citation:	Susarla, S., Masunaga, S., Yonezawa, Y. (1996). Biotransformation of halogenated benzenes in anaerobic sediments. Environmental Science and Pollution Research 3(2):71-74.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	1969905			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Low	Composition profile of contaminated river water and sediment not reported.
	Metric 6:	Testing Conditions	High	Testing conditions reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	High	The system type and design were appropriate.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Low	Limited detail regarding microbial viability of sediment.
	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 was appropriate; data for degradation product of 1,4-dichlorobenzene.
	Metric 12:	Test Substance Purity	Low	Limited detail regarding sampling methods.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Sources of variability and uncertainty in the measurements were not considered or accounted for in data evaluation resulting in some uncertainty.
	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	There was insufficient evidence presented to confirm that parent compound disappearance was exclusively due to microbial degradation.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Due to limited information on the composition profile of the matrix, evaluation of 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		

Study Citation:	Susarla, S., Yonezawa, Y., Masunaga, S. (1998). Reductive transformations of halogenated aromatics in anaerobic estuarine sediment: Kinetics, products and pathways. Water Research 32(3):639-648.
OECD Harmonized Template:	Biodegradation in Sediment
HERO ID:	5237531

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, EndPoint, Type, Guideline	None; inherent biodegradability; Experimental; other: Guideline not specified; biodegradation in anerobic sediment
Solvent, Reactivity, Storage, Stability	Methanol; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Tokyo Kasei Kogyo (TCI), Tokyo; Liquid; Used without further purification
Oxygen and Inoculum	anaerobic; natural water / sediment: brackish: Sediment and river water collected from mouth of Tsurumi River, Japan. Visual evidence of sulfate-reducing activity
Duration, Parameter, System, and Sampling Frequency	1 y; test mat.; 25 screw-top test tubes with 5 mL sediment-water slurry, hand-mixed 3x/wk by inverting test tubes several times; Immediately after spiking, once a day, progressing to longer intervals
Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH	Not Reported; Sediment-water slurry; Not Reported; Not Reported; Not Reported; 5.6 (slurry); 4.8 (sediment pore water)
Control Dark, Control, and Blank Concentration	Not Reported; Not reported; Autoclaved sediment samples (120°C for 20 min) 4 µmol/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-MS; Slurry extracted with acetone and benzene; MS ChemStation used to operate GC-MS; 7
Results Remarks	6 d lag period observed
Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results	385 d; Not reported; Autoclaved sediment sample; Loss rate constant not significantly different from 0 in sediment-water slurry
Results Details	k=0.0018 / d
Mean Total Recovery Results and Results Per Recovery	50 - 100%; Not reported
Results Value, Direct Quantum Yield Results, and Transformation Products	Not Reported; Not Reported; Monochlorobenzene

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 information was provided.
Domain 2: Test Design	Metric 3:	Study Controls	High	An autoclaved sediment sample was included as a concurrent control.
	Metric 4:	Test Substance Stability	High	The test substance preparation and sample storage conditions were reported and appropriate for the study and the substance.

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Study Citation:	Susarla, S., Yonezawa, Y., Masunaga, S. (1998). Reductive transformations of halogenated aromatics in anaerobic estuarine sediment: Kinetics, products and pathways. Water Research 32(3):639-648.			
OECD Harmonized Template:	Biodegradation in Sediment			
HERO ID:	5237531			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Test conditions (anerobic, redox, pH, temperature) were reported and appropriate for the study.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and 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 is routinely used for similar study types.
	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	Sample methods addressed the outcomes of interest and used widely acceptable approaches.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability between study groups was 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	High	Analytical methods were suitable for the detection of the target chemical, some recovery information was reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Kinetic calculations were described and applied appropriately.
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 the study type.
Overall Quality Determination		High		

Study Citation:	Brunsbach, F. R., Reineke, W. (1994). Degradation of chlorobenzenes in soil slurry by a specialized organism. Applied Microbiology and Biotechnology 42(2-3):415-420.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	659847

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Non-guideline aerobic biodegradation study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Oxygen, pH, and CEC	aerobic; soil 1= 7.6, soil 2 6.0; phosphate buffer pH 7.3; Not reported
Test Type, Test Temperature, and Test Details	laboratory; 27°C; soil slurries with 29% suspended solids w/w dry soil inoculated with chlorobenzene-degrading organisms
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	silt loam; Soil 1: 8% organic matter; chloride 0.15 mmol/g soil; Soil 2: 2.6% organic matter; chloride 0.73 mmol/g soil; Not reported
Soil Classification, Microbial Biomass, and Humidity	Soil 1: silty loam soil, Soil 2: loamy sand soil; Indigenous soil population Soil 1: 1.5E+5 cfu on malt extract agar, 6E+6 cfu and nutrient broth agar, 4E+6 cfu on plate count agar, soil 2: 6.5E+5 cfu on malt extract agar, 3E+6 cfu and nutrient broth agar, 2E+6 cfu on plate count agar: moisture content soil 1: 30-33%, soil 2: 2%
Duration, Parameter, System, and Sampling Frequency	1 month; test mat.; Teflon-sealed glass tubes; Not reported
Control and Blank	abiotic control included; Not reported
Concentration	1 mmol/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	reverse phase HPLC; Vapor phase - headspace analysis; chloride detected in aqueous phase by ion chromatography; Not reported
Results Remarks	1,4-Dichlorobenzene persisted after 1 month incubation in soil slurry 2. No chloride elimination was detected in soil slurry 1.
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Reference Substance Compartment Results	No significant degradation; Not reported; Not reported; Not reported; Not reported
Results Details	Not reported
Mean Total Recovery Results and Results Per Recovery	Not reported; Soil 1: 16% in headspace, 18% in water phase, 66% in solid phase; Soil 2: 19% in headspace, 23% in water phase, 58% in solid phase

EVALUATION				
Domain	Metric		Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High	The test substance was identified clearly.
	Metric 2:	Test Substance Purity	Low	The test substance source and purity were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 4:	Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.

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Study Citation:	Brunsbach, F. R., Reineke, W. (1994). Degradation of chlorobenzenes in soil slurry by a specialized organism. Applied Microbiology and Biotechnology 42(2-3):415-420.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	659847			
Domain	Metric	EVALUATION		Comments
		Rating		
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	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for 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	High	The outcome assessment methodology addressed or reported the intended outcome of interest.
	Metric 12:	Test Substance Purity	Medium	Some sampling details were omitted but this was unlikely to impact the study results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	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 and extraction efficiency were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study type.
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			High	

Study Citation:	Demirjian, Y. A., Joshi, A. M., Westman, T. R. (1987). Fate of organic compounds in land application of contaminated municipal sludge. Journal of Water Pollution Control Federation 59(1):32-38.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	1359392

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	No; Inherent biodegradability; Inherent biodegradation, sludge amended soil; Not Reported
Solvent, Reactivity, Storage, Stability	NA; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Muskegon County Wastewater Treatment; NR; NA Notes: Applied from sludge from wastewater treatment
Oxygen, pH, and CEC	Not specified; NR; NR
Test Type, Test Temperature, and Test Details	field trial; NR; Not Reported
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	other; NR; NR
Soil Classification, Microbial Biomass, and Humidity	Rubicon sand; NR: NR
Duration, Parameter, System, and Sampling Frequency	241 days; Test material; Field plots 3.05 m by 3.05 m with sludge from aeration cell hand applied. Sludge tilled within 5 days post-application.; 0, 5, 122, and 241 days
Control and Blank	NA; Control plots without sludge amendment were included.
Concentration	415 ug/kg
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-MS; Samples soxhlet extracted and concentrated using a Kuderna-Danish apparatus; Disappearance of test substance
Results Remarks	Not detected in background level of soil 0 - 15.2 cm or 22.9 - 38.1 cm.5 days: 432 ug/kg (0 - 15.2 cm), not detected (22.9 - 38.1 cm)122 days: 104 ug/kg (0 - 15.2 cm), 41 ug/kg (22.9 - 38.1 cm)241 days: 230 ug/kg (0 - 15.2 cm), 28 ug/kg (22.9 - 38.1 cm)Percent degradation calculated by reviewer: $([DCB_0] - ([DCB\ 0 - 15.2\ cm] + [DCB\ 22.9 - 38.1\ cm]))/[DCB_0]$
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	38%; Not Reported; 241 days; NR; NR
Results Details	NR
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	N/A	Not applicable for studies involving field samples.
Domain 2: Test Design				
	Metric 3:	Study Controls	Low	A blank control was included but a sterile control was not; disappearance could therefore not be confirmed as due to biodegradation.

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Study Citation:	Demirjian, Y. A., Joshi, A. M., Westman, T. R. (1987). Fate of organic compounds in land application of contaminated municipal sludge. Journal of Water Pollution Control Federation 59(1):32-38.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	1359392			
Domain		Metric		EVALUATION
				Rating
				Comments
	Metric 4:	Test Substance Stability	N/A	Not applicable for studies involving field samples.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	No field conditions were reported; limited soil and sludge characteristics were reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups and replicates.
	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 consistently used for similar study types.
	Metric 10:	Sampling Methods	N/A	Not applicable.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Low	Biodegradation rate and percentages were not reported; products were not identified. Because a sterile control was not included, loss could not be confirmed to be biodegradation.
	Metric 12:	Test Substance Purity	Medium	Sampling methods were reported generally, frequency was acceptable.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty and variability were not explicitly accounted for.
	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 and extraction efficiency were not reported. Raw data was reported. Percent loss was calculated by the reviewer.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical and kinetic calculations were not conducted.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Loss could not be attributed to biodegradation solely.
	Metric 18:	QSAR Models	N/A	Not applicable.
Overall Quality Determination			Medium	

Study Citation:	Gejlsbjerg, B., Klinge, C., Madsen, T. (2001). Mineralization of organic contaminants in sludge-soil mixtures. Environmental Toxicology and Chemistry 20(4):698-705.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	789785

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, EndPoint, Type, Guideline	None; inherent biodegradability; Experimental; other: Mineralization in sludge-soil mixture
Solvent, Reactivity, Storage, Stability	Acetone; NR; NR; NR
Radiolabel, Source, State, Purity	Uniformly labeled 14C; Sigma Chemical (St. Louis, MO, USA); Liquid; >98% radiochemical purity Notes: 9.4 mCi/mmol
Oxygen, pH, and CEC	aerobic; 6.0; Not reported
Test Type, Test Temperature, and Test Details	laboratory; 15°C; Test substance mixed and allowed to sorb to dewatered activated sludge (domestic, from WWTP in Lundtofte, Denmark) and allowed to sorb for 24 h. The treated sludge was then mixed with the soil in a sludge:soil ratio of 1:20 or 1:100 dry wt.
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	other; 76.8% coarse sand, 12.2% fine sand, 4.1% silt, 3.9% clay, 3.0% organic matter; Not reported
Soil Classification, Microbial Biomass, and Humidity	Sandy soil; Not reported; 40 or 80% water-holding capacity (WHC=NR)
Duration, Parameter, System, and Sampling Frequency	2 mo; radiochem. meas.; Test media placed in glass tubes, pressed into 25 mm core; tubes placed in a 200 mL glass jar with atmospheric air. Glass vial trap with KOH placed in each jar for 14CO ₂ ; Not reported
Control and Blank	Not reported; Not reported
Concentration	ca. 10000 dpm/g wet wt
Analytical Method, Analytical Details, and Results Per Degredation Parameter	Gas chromatography-mass spectrometry; No further details reported; Mineralization % of added 14C
Results Remarks	Reported for sludge only, 1:20 ratio 40% WHC, 1:20 ratio 80% WHC, 1:100 ratio 40% WHC, and 1:100 80% WHC groups, respectively. Approximate lag time of 30 days observed. Initial concentration: 7.2, 0.34, 0.34, 0.071, and 0.071 mg/kg dry wt.
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Reference Substance Compartment Results	31.8, 12.4, 21.6, 1.99, and 0.69%; $\pm 7.75, \pm 9.72, \pm 2.26, \pm 0.21$, and ± 0.20 (n=4); 2 mo; Not reported; Not reported
Results Details	Maximum rate: 1.1 ± 0.18 , 0.49 ± 0.66 , 0.66 ± 0.02 , 0.03 ± 0.005 , and $0.01 \pm 0.001\%$ of initial concentration/day
Mean Total Recovery Results and Results Per Recovery	Not reported; 14C % recovery: $34.3 \pm 7.8\%$, $21.9 \pm 13.6\%$, $31.3 \pm 5.1\%$, $5.9 \pm 3.0\%$, and $2.4 \pm 0.3\%$, respectively

EVALUATION			
Domain	Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	High	The test substance was identified definitively.
	Metric 2:	High	The source and purity of the test substance was reported.
Domain 2: Test Design	Metric 3:	Medium	A concurrent negative or positive control was not explicitly included, however this was not likely to have a substantial impact on study results. The solvent was evaporated before test start, and is unlikely to influence study results.

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Study Citation:	Gejlsbjerg, B., Klinge, C., Madsen, T. (2001). Mineralization of organic contaminants in sludge-soil mixtures. Environmental Toxicology and Chemistry 20(4):698-705.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	789785			
Domain		Metric	EVALUATION	
			Rating	Comments
	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 method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Most test conditions were reported, with a few omissions (CEC).
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups and replicates.
	Metric 8:	System Type and Design	Medium	There were some omissions in system type and design; however, the omissions were not likely to have a substantial impact on study results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was provided and is routinely used for similar study types.
	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	High	The study reported acceptable sampling methods 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 between study groups were accounted for in data evaluation and were not likely to influence 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	High	Analytical methods were suitable for detection of the target chemical and sufficient evidence was presented to confirm that the parent was disappearing due to biodegradation.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods and kinetic calculations were described and address the datasets.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were plausible.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination**High**

Study Citation:	Hutchins, S. R., Tomson, M. B., Wilson, J. T., Ward, C. H. (1984). Microbial removal of wastewater organic compounds as a function of input concentration in soil columns. Applied and Environmental Microbiology 48(5):1039-1045.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	1805200

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Mineralization in batch tests with soil columns
Solvent, Reactivity, Storage, Stability	Methanol; NR; Stock dilutions sterilized by filtration and stored at -18C; final concentrations were checked by GC; NR
Radiolabel, Source, State, Purity	p-[U-14C] dichlorobenzene (22.2 mCi/mM; ≥98% purity); Pathfinder Laboratories, St. Louis, Mo.; Aldrich Chemical Co., Milwaukee, Wis; Solution; NR
Oxygen, pH, and CEC	aerobic; Not reported; Not reported
Test Type, Test Temperature, and Test Details	laboratory; 25C; Soil from columns were placed in glass bottles with Teflon-lined rubber septa for determination of respiration with substrate
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	sand; Not reported; Not reported
Soil Classification, Microbial Biomass, and Humidity	Soil (sandy gravel) was obtained from a rapid infiltration facility at Fort Devens, Mass.; Not reported: Moisture content of column soil=6.8% and forest soil=15%
Duration, Parameter, System, and Sampling Frequency	16 hours; CO2 evolution; Soil columns operated on a 6 day flooding 16 day drying cycle; Not reported
Control and Blank	Not reported; Abiotic controls amended with Hg2Cl
Concentration	1 ng/g
Analytical Method, Analytical Details, and Results Per Degredation Parameter	Liquid scintillation; Not reported; % of theoretical CO2 evolved
Results Remarks	Not reported
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and References Substance Compartment Results	0.75±0.09% (forest soil and biocide) and 0.72±0.08% (forest soil); 2.63±0.06% (column soil and biocide) and 6.52±0.63% (column soil); See value; Not reported; Not reported; Not reported
Results Details	Not reported
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 chemical name.
	Metric 2:	Test Substance Purity	High	The test substance source and purity was reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	Controls were included; results presented in table 1.
	Metric 4:	Test Substance Stability	High	Details regarding this metric were appropriate.

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Study Citation:	Hutchins, S. R., Tomson, M. B., Wilson, J. T., Ward, C. H. (1984). Microbial removal of wastewater organic compounds as a function of input concentration in soil columns. Applied and Environmental Microbiology 48(5):1039-1045.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	1805200			
Domain	Metric	EVALUATION		Comments
		Rating		
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 were not provided; however, the omissions were not likely to have had a substantial impact on the study results.
	Metric 7:	Testing Consistency	N/A	Not applicable; this study evaluated a treatment system.
	Metric 8:	System Type and Design	N/A	Not applicable; this study evaluated a treatment system.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The microbial activity was not reported; however killed controls were included.
	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 was appropriate for this study.
	Metric 12:	Test Substance Purity	Medium	The sampling was reported with minimal detail.
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 (if applicable) 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; the study evaluated a treatment system.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Abiotic control results were not reported; analytical detail was omitted.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical methods were not described.
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			High	

Study Citation:	Kurt, Z., Spain, J. C. (2013). Biodegradation of chlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene in the vadose zone. Environmental Science & Technology 47(13):6846-6854.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	1752483

Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; experimental; other: Degradation in vadose zone
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; Sigma-Aldrich; NR; $\geq 99\%$ Notes: 14DCB
Oxygen, pH, and CEC	aerobic/anaerobic; 6-9 (from figure); not reported
Test Type, Test Temperature, and Test Details	laboratory; 22–24 °C; The porosity of the material was measured as 35%, and the seepage velocity in the column was calculated to be 51 m/h. An aerobic zone was established/maintained by passing humidified and filter sterilized air across the top of the column.
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	sandy clay; not reported; not reported
Soil Classification, Microbial Biomass, and Humidity	12 cm above to 12 cm below the capillary fringe.; Chlorobenzene degrading bacteria previously isolated from the core samples.: 15% by weight
Duration, Parameter, System, and Sampling Frequency	not reported; test mat.; multiport glass column was packed with sand or; 6 ports along the length of column
Control and Blank	Not Reported; anoxic conditions control
Concentration	1.25 (from figure) - 5 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC/FID; not reported; biodegradation rate (fluxes)
Results Remarks	biodegradation was robust, oxygen dependent, and concentrated within the capillary fringe.
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and References Substance Compartment Results	7.4 mg/sq m/day; ± 0.7 ; not reported; not reported; Not Reported
Results Details	Not Reported
Mean Total Recovery Results and Results Per Recovery	not reported; For anoxic control, 0.3 and 0.8 mg/L difference between influent and effluent concentrations in control phase and active phase, respectively.

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	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:	Kurt, Z., Spain, J. C. (2013). Biodegradation of chlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene in the vadose zone. Environmental Science & Technology 47(13):6846-6854.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	1752483			
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	Medium	Nominal concentrations were provided, but, the levels were not sufficiently reported.
	Metric 6:	Testing Conditions	Low	Testing conditions were confusing.
	Metric 7:	Testing Consistency	Medium	Some test conditions across samples or study groups were not reported, but these discrepancies were not likely to have a substantial impact on study results.
	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	Low	An inoculum that was pre-adapted to the test substance was used for a biodegradation rate 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	There was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	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	Medium	Sources of uncertainty in the measurements were reported in the study however; the minor deviations or omissions were not likely to have a substantial impact on 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 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	Medium	kinetic calculations were not clearly described
Domain 8: Other				
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Study Citation:	Kurt, Z., Spain, J. C. (2013). Biodegradation of chlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene in the vadose zone. Environmental Science & Technology 47(13):6846-6854.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	1752483			
		EVALUATION		
Domain	Metric	Rating	Comments	
	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:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	4912216

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Not reported; biodegradation in marsh soils.
Solvent, Reactivity, Storage, Stability	Deionized water; NR; NR; NR
Radiolabel, Source, State, Purity	Uniformly labeled [14C], 19.99 mCi/mmol; Sigma Chemical, St. Louis, MO, USA; Liquid; >95% (radiochemical purity); 99.5% (nonradiolabeled purity) Notes: Mixture of radiolabeled and non-radiolabeled compound in deionized water
Oxygen, pH, and CEC	aerobic; Not reported; NRNR
Test Type, Test Temperature, and Test Details	laboratory; 25°C; Samples of base trap removed and analyzed for 14CO2 content after 2 d application (freshly contaminated) or 2, 7, and 31 d after application (desorption resistant fraction)
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	other; 23.1% organic carbon; Not reported
Soil Classification, Microbial Biomass, and Humidity	Deep marsh soil (20 - 40 cm) collected from freshwater marsh in Madisonville, LA, USA; Not reported: Soil:water ratio: 0.04 - 0.05 kg/L
Duration, Parameter, System, and Sampling Frequency	31 d; test mat.; 200 mL serum bottles capped with Teflon-lined silicone septa, with a CO2 trap containing NaOH, placed on rotary shaker at 100 rpm (freshly applied) or 80 rpm for 2 d (desorption resistant); Not reported
Control and Blank	Not reported; Not reported
Concentration	5 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	Liquid scintillation counting (radiochemical analysis); Purge-and-trap liquid sample concentrator attached to GC-MS (aqueous samples); Biological Oxidizer (soil samples); Radiolabeled samples transferred to vials containing scintillation counting cocktail; soil samples combusted, carbon-14 cocktail used to trap the existing 14CO2; Soil extracted 2x with isopropanol, rinsed with electrolyte solution, aqueous phase analyzed; % mineralization (14CO2)
Results Remarks	Mineralization rates factor than expected if assuming desorption must occur before biodegradation; bacteria are able to biodegrade sorbed 1,4-DCB. Bacteria can also rapidly access desorption-resistant 1,4-DCB. Mineralization decreased as contact time increased.
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and References Substance Compartment Results Details	46.2%; $\pm 2.7\%$; 2 d; Absence of soil, 1,4-DCB degrading culture; $30.8 \pm 1.2\%$ mineralization $k=0.026 \pm 0.0004$
Mean Total Recovery Results and Results Per Recovery	First order mineralization model: $P=P_{\max}(1 - e^{-(kt)})$ P =% initial radioactivity mineralized $P_{\max}$ =max % mineralized Freshly contaminated soil, $k=0.011 \pm 0.002$ ($r^2=0.58$) Desorption-resistant $P_{\max}$ (2, 7, 31 d): $38.3 \pm 1.7\%$, $22.0 \pm 3.9\%$, $21.6 \pm 3.0\%$ Desorption-resistant k (2, 7, 31 d): 0.009 ± 0.001 , 0.003 ± 0.001 , $0.002 \pm 0.001/\text{hr}$ ($r^2=0.98$, 0.96, 0.99)

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 purity were reported.

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Study Citation:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.				
OECD Harmonized Template:	Biodegradation in Soil				
HERO ID:	4912216				
Domain		Metric	EVALUATION Rating		Comments
Domain 2: Test Design					
	Metric 3:	Study Controls	Medium	Controls were not explicitly included.	
	Metric 4:	Test Substance Stability	High	Test substance solvent and applied concentrations were reported.	
Domain 3: Test Conditions					
	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.	
	Metric 6:	Testing Conditions	Medium	Limited testing conditions (temperature, soil organic carbon content) were reported.	
	Metric 7:	Testing Consistency	High	Test method was applied consistently across 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	N/A	This metric is not applicable to the study type.	
	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 the outcomes of interest.	
	Metric 12:	Test Substance Purity	High	Sample methods addressed the outcomes of interest and used accepted approaches, rate constants were able to be determined.	
Domain 6: Confounding/Variable Control					
	Metric 13:	Confounding Variables	High	Variability between samples was addressed by statistical methods.	
	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 analytical methods were appropriate, percent recovery and limits of detection were not reported. Evidence supporting biodegradation (CO2) was provided.	
	Metric 16:	Statistical Methods and Kinetic Calculations	High	First order kinetic calculations were described and applied appropriately.	
Domain 8: Other					
	Metric 17:	Verification or Plausibility of Results	Medium	The results are reasonable based on the method however the study is low in detail.	
	Metric 18:	QSAR Models	N/A	This metric is not applicable to the study type.	

Overall Quality Determination**High**

Study Citation:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	4912216

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Not reported; biodegradation in marsh soils.
Solvent, Reactivity, Storage, Stability	Deionized water; NR; NR; NR
Radiolabel, Source, State, Purity	Uniformly labeled [14C], 19.99 mCi/mmol; Sigma Chemical, St. Louis, MO, USA; Liquid; >95% (radiochemical purity); 99.5% (nonradiolabeled purity) Notes: Mixture of radiolabeled and non-radiolabeled compound in deionized water
Oxygen, pH, and CEC	aerobic; Not reported; NRNR
Test Type, Test Temperature, and Test Details	laboratory; 25°C; Samples of base trap removed and analyzed for 14CO ₂ content after 2 d application (freshly contaminated) or 2, 7, and 31 d after application (desorption resistant fraction)
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	other; 27.6% organic carbon; Not reported
Soil Classification, Microbial Biomass, and Humidity	Surface marsh soil (0 - 20 cm) collected from freshwater marsh in Madisonville, LA, USA; Not reported: Soil:water ratio: 0.04 - 0.05 kg/L
Duration, Parameter, System, and Sampling Frequency	31 d; test mat.; 200 mL serum bottles capped with Teflon-lined silicone septa, with a CO ₂ trap containing NaOH, placed on rotary shaker at 100 rpm (freshly applied) or 80 rpm for 2 d (desorption resistant); Not reported
Control and Blank	Not reported; Not reported
Concentration	5 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	Liquid scintillation counting (radiochemical analysis); Purge-and-trap liquid sample concentrator attached to GC-MS (aqueous samples); Biological Oxidizer (soil samples); Radiolabeled samples transferred to vials containing scintillation counting cocktail; soil samples combusted, carbon-14 cocktail used to trap the existing 14CO ₂ ; Soil extracted 2x with isopropanol, rinsed with electrolyte solution, aqueous phase analyzed; % mineralization (14CO ₂)
Results Remarks	Mineralization rates factor than expected if assuming desorption must occur before biodegradation; bacteria are able to biodegrade sorbed 1,4-DCB. Bacteria can also rapidly access desorption-resistant 1,4-DCB. Mineralization decreased as contact time increased.
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and References Substance Compartment Results	61.2%; ± 2.5%; 2 d; Absence of soil, 1,4-DCB degrading culture; 30.8±1.2% mineralization k=0.026±0.0004
Results Details	First order mineralization model: $P = P_{max}(1 - e^{-(kt)})$ P=% initial radioactivity mineralized P _{max} =max % mineralized Freshly contaminated soil, k=0.012±0.002 (r ² =0.97) Desorption-resistant P _{max} (2, 7, 31 d): 37.4±1.7%, 27.0±2.3%, 21.9±1.8% Desorption-resistant k (2, 7, 31 d): 0.014±0.003, 0.004±0.001, 0.003±0.001/hr (r ² =0.95, 0.98, 0.98)
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 test substance source and purity were reported.
Domain 2: Test Design			

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Study Citation:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	4912216			
Domain		Metric	EVALUATION Rating	Comments
	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	High	Test substance solvent and applied concentrations were reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Limited testing conditions (temperature, soil organic carbon content) were reported.
	Metric 7:	Testing Consistency	High	Test method was applied consistently across 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	N/A	This metric is not applicable to the study type.
	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 the outcomes of interest.
	Metric 12:	Test Substance Purity	High	Sample methods addressed the outcomes of interest and used accepted approaches, rate constants were able to be determined.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability between samples was addressed by statistical methods.
	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 analytical methods were appropriate, percent recovery and limits of detection were not reported. Evidence supporting biodegradation (CO2) was provided.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	First order kinetic calculations were described and applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results are reasonable based on the method however the study is low in detail.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to the study type.
Overall Quality Determination			High	

Study Citation:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	4912216

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Not reported; biodegradation in marsh soils.
Solvent, Reactivity, Storage, Stability	Deionized water; NR; NR; NR
Radiolabel, Source, State, Purity	Uniformly labeled [14C], 19.99 mCi/mmol; Sigma Chemical, St. Louis, MO, USA; Liquid; >95% (radiochemical purity); 99.5% (nonradiolabeled purity) Notes: Mixture of radiolabeled and non-radiolabeled compound in deionized water
Oxygen, pH, and CEC	aerobic; Not reported; NRNR
Test Type, Test Temperature, and Test Details	laboratory; 25°C; Samples of base trap removed and analyzed for 14CO ₂ content after 2 d application (freshly contaminated) or 2, 7, and 31 d after application (desorption resistant fraction)
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	other; 1.4% organic carbon; Not reported
Soil Classification, Microbial Biomass, and Humidity	PPI soil (0 - 20 cm) collected from bottomland hardwood swamp next to the Brooklawn site; Not reported: Soil:water ratio: 0.31 - 0.35 kg/L
Duration, Parameter, System, and Sampling Frequency	31 d; test mat.; 200 mL serum bottles capped with Teflon-lined silicone septa, with a CO ₂ trap containing NaOH, placed on rotary shaker at 100 rpm (freshly applied) or 80 rpm for 2 d (desorption resistant); Not reported
Control and Blank	Not reported; Not reported
Concentration	5 mg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	Liquid scintillation counting (radiochemical analysis); Purge-and-trap liquid sample concentrator attached to GC-MS (aqueous samples); Biological Oxidizer (soil samples); Radiolabeled samples transferred to vials containing scintillation counting cocktail; soil samples combusted, carbon-14 cocktail used to trap the existing 14CO ₂ ; Soil extracted 2x with isopropanol, rinsed with electrolyte solution, aqueous phase analyzed; % mineralization (14CO ₂)
Results Remarks	Mineralization rates factor than expected if assuming desorption must occur before biodegradation; bacteria are able to biodegrade sorbed 1,4-DCB. Bacteria can also rapidly access desorption-resistant 1,4-DCB. Mineralization decreased as contact time increased.
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and References Substance Compartment Results	28.2%; ± 0.81%; 2 d; Absence of soil, 1,4-DCB degrading culture; 30.8±1.2% mineralization k=0.026±0.0004
Results Details	First order mineralization model: $P = P_{max}(1 - e^{-(kt)})$ P=% initial radioactivity mineralized P _{max} =max % mineralized Freshly contaminated soil, k=0.017±0.002 (r ² =0.98) Desorption-resistant P _{max} (2, 7, 31 d): 23.9±1.2%, 22.0±0.9%, 21.6±3.0% Desorption-resistant k (2, 7, 31 d): 0.01±0.002, 0.009±0.001, 0.002±0.0005/hr (r ² =0.96, 0.96, 0.99)
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 test substance source and purity were reported.
Domain 2: Test Design			

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Study Citation:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	4912216			
Domain		Metric	EVALUATION Rating	Comments
	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	High	Test substance solvent and applied concentrations were reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Limited testing conditions (temperature, soil organic carbon content) were reported.
	Metric 7:	Testing Consistency	High	Test method was applied consistently across 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	N/A	This metric is not applicable to the study type.
	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 the outcomes of interest.
	Metric 12:	Test Substance Purity	High	Sample methods addressed the outcomes of interest and used accepted approaches, rate constants were able to be determined.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability between samples was addressed by statistical methods.
	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 analytical methods were appropriate, percent recovery and limits of detection were not reported. Evidence supporting biodegradation (CO2) was provided.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	First order kinetic calculations were described and applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results are reasonable based on the method however the study is low in detail.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to the study type.
Overall Quality Determination			High	

Study Citation:	Nay, M., Snozzi, M., Zehnder A, J. B. (1999). Fate and behavior of organic compounds in an artificial saturated subsoil under controlled redox conditions: The sequential soil column system. Biodegradation 10(1):75-82.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	1485512

EXTRACTION

Parameter	Data
CASRN and Test Material	Not Reported; 1,4-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	No; other; experimental; other: Non-guideline: sequential soil column study
Solvent, Reactivity, Storage, Stability	ethanol and water; Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, Purity	Not Reported; Fluka AG, Buchs, Switzerland; Not Reported; Not Reported
Oxygen, pH, and CEC	aerobic; not reported; not reported
Test Type, Test Temperature, and Test Details	laboratory; 25±1°C; Two column series were used: SSCS1 and SSCS2 differing in the collection date of the inoculums; redox conditions established sequentially were first: methanogenic (CO2), second: sulfate-reducing (SO4), third: nitrate-reducing (NO3), and last: aerobic conditions (O2)
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	sand; Quartz sand (300 ml) was inoculated with about 10 mL of mixed material.; Not Reported
Soil Classification, Microbial Biomass, and Humidity	SSCS1: Mixed inoculum materials obtained from leachate channels (Jan. 1995) and from leachate collecting pool under these channels (Jan. 1995), and anaerobic primary sludge from municipal wastewater treatment plant Glatt (Jan. 1995). SSCS2: Mixed inoculum material was obtained from leachate channels (Sept. 1995) and from leachate collecting pool under these channels (Sept. 1995), and drill core samples from a recultivated landfill near Riet, dating back to the 1920s (Sept. 1995).; Mixed material: inocula were collected at the drainage system of a landfill and anaerobic primary sludge was used from the municipal wastewater treatment plant Glatt; SSCS1: not reported
Duration, Parameter, System, and Sampling Frequency	8 months; test mat.; sequential soil column system; not specified; system set to recover for 12h between single samples and 5 days between a series of sampling events.
Control and Blank	not reported; not reported
Concentration	150 µg/L
Analytical Method, Analytical Details, and Results Per Degredation Parameter	Not Reported; GC-FID and ECD (analytical errors <5%, recoveries ranged between 86-114%, detection limit less than or equal to 15 µg/L); HPLC analytical errors <5%, detection limit less than or equal to 200 µg/L; Not Reported
Results Remarks	Nearly complete transformation was observed in SSCS1, DCB concentration decreased to less than 1% after 8 months; the majority of the disappearance observed under aerobic conditions. Concentration at inlet of first column ca. 0.85 µM, after first (CO2) ca 0.84 µM, after second (SO4) ca. 0.80 µM, after third (NO3) ca. 0.68 µM (about 20% loss), and after the last (O2) less 1% remained (>99% loss). Additionally, no significant transformation was observed in the methanogenic columns of SSCS2.
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Reference Substance Compartment Results	Not Reported; Not Reported; Not Reported; Not Reported; Not Reported
Results Details	Not Reported
Mean Total Recovery Results and Results Per Recovery	Not Reported; Not Reported

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	High	The test substance was identified.
	Test Substance Identity		

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Study Citation:	Nay, M., Snozzi, M., Zehnder A, J. B. (1999). Fate and behavior of organic compounds in an artificial saturated subsoil under controlled redox conditions: The sequential soil column system. Biodegradation 10(1):75-82.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	1485512			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 2:	Test Substance Purity	High	The source of the test substance was reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Control groups 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.
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 reported.
	Metric 7:	Testing Consistency	High	The conditions of the exposure were documented.
	Metric 8:	System Type and Design	High	The system type and design were appropriate.
Domain 4: Test Organisms	Metric 9:	Outcome Assessment Methodology	High	Inoculum sources 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	Medium	Minor limitations were identified in sampling methods and were addressed.
Domain 6: Confounding/Variable Control	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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	Details from one system in which the target did not degrade were omitted.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study type.
Domain 8: Other	Metric 17:	Verification or Plausibility of Results	Low	The study results were reasonable; however, details from one system in which the target did not degrade were omitted.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

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Study Citation:	Nay, M., Snozzi, M., Zehnder A, J. B. (1999). Fate and behavior of organic compounds in an artificial saturated subsoil under controlled redox conditions: The sequential soil column system. Biodegradation 10(1):75-82.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	1485512

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Determination		High	

Study Citation:	Nay, M., Snozzi, M., Zehnder, A. J. B. (1999). Behavior of chemical contaminants under controlled redox conditions in an artificial sequential soil column system and in batch cultures. Biodegradation 10(6):405-414.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	1942982

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; screening test; Experimental; other: Non-guideline batch soil column system study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Fluka AG; NR; Not Reported Notes: deionized water
Oxygen, pH, and CEC	anaerobic; Not reported; Not reported
Test Type, Test Temperature, and Test Details	laboratory; 25±1°C; References to Nay et al. (1999)
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	other; Not reported; Not reported
Soil Classification, Microbial Biomass, and Humidity	calcite stones, washed quartz sand; drainage system of the landfill Riet (Winterthur, Switzerland): Not reported
Duration, Parameter, System, and Sampling Frequency	120 days; test mat.; Batch experiments columns containing quartz sand as the matrix; available in figure (about 5 days)
Control and Blank	Not reported; sterile controls included
Concentration	1 - 2.7 µM
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC and HPLC; Quantification limits of GC and HPLC <250 nM and 5 µM, respectively; transformation rates
Results Remarks	Not reported
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Reference Substance Compartment Results	Methanogenic conditions: 0-5 nmol d-1 L-1, Sulfate reducing conditions: 0-15 nmol d-1 L-1, Nitrate reducing conditions: 3-31 nmol d-1 L-1; Not reported; Days 1, 51 and 92; Not reported; Not reported
Results Details	Not reported
Mean Total Recovery Results and Results Per Recovery	86-113%; Not reported

EVALUATION			
Domain	Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High
	Metric 2:	Test Substance Purity	Medium
Domain 2: Test Design	Metric 3:	Study Controls	Medium
			The study included sterile control groups, but results were not discussed in detail.

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Study Citation:	Nay, M., Snozzi, M., Zehnder, A. J. B. (1999). Behavior of chemical contaminants under controlled redox conditions in an artificial sequential soil column system and in batch cultures. Biodegradation 10(6):405-414.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	1942982			
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.
	Metric 6:	Testing Conditions	High	Test conditions were appropriate.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	High	The system was appropriate.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The microbial source was reported.
	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	High	The outcome assessment methodology addressed the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	Sampling methods were appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Confounding variable were presented.
	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	Medium	Some details about target chemical concentrations, extraction efficiency and mass balance were omitted.
	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	High	The study results are reasonable.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to this type of study.
Overall Quality Determination			High	

Study Citation:	Van Der Meer, J. R., Bosma, T. N., De Bruin, W. P., Harms, H., Holliger, C., Rijnaarts, H. H., Tros, M. E., Schraa, G., Zehnder, A. J. (1992). Versatility of soil column experiments to study biodegradation of halogenated compounds under environmental conditions. Biodegradation 3(2-3):265-284.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	647132

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Water saturated soil column experiment for biodegradation
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Oxygen, pH, and CEC	aerobic; Not reported; Not reported
Test Type, Test Temperature, and Test Details	laboratory; Not reported; Soil columns in sediment of Rhine River and Dune infiltration area near Amsterdam
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	other; Not reported; Not reported
Soil Classification, Microbial Biomass, and Humidity	Not reported; Not reported: Not reported
Duration, Parameter, System, and Sampling Frequency	Not reported; not specified; Soil column; Not reported
Control and Blank	Not reported; Not reported
Concentration	Not reported
Analytical Method, Analytical Details, and Results Per Degredation Parameter	Not reported; Not reported; % removal
Results Remarks	Observed degradation
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and References Substance Compartment Results	between 25-90%; Not reported; Not reported; Not reported; Not reported
Results Details	Not reported
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
	Metric 2:	Test Substance Purity	Low
Domain 2: Test Design	Metric 3:	Study Controls	Uninformative
			Concurrent control groups were not included.

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Study Citation:	Van Der Meer, J. R., Bosma, T. N., De Bruin, W. P., Harms, H., Holliger, C., Rijnaarts, H. H., Tros, M. E., Schraa, G., Zehnder, A. J. (1992). Versatility of soil column experiments to study biodegradation of halogenated compounds under environmental conditions. Biodegradation 3(2-3):265-284.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	647132			
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	Low	There were multiple omissions in testing conditions.
	Metric 7:	Testing Consistency	N/A	Not applicable; multiple study groups were not reported.
	Metric 8:	System Type and Design	Medium	Some system design details were not provided; however, this was not likely to have influenced the interpretation of the results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	Microbial biomass 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	Low	Basis for biodegradation not reported; very large range reported.
	Metric 12:	Test Substance Purity	Low	Sampling details were omitted.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	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	Uninformative	Insufficient detail; analytical method not reported; The target chemical concentrations, extraction efficiency, percent recovery, and mass balance were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	Low	No details; degradation kinetics not specified.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Insufficient data; 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**Uninformative**

* Related References: HSDB

Study Citation:	Van Der Meer, J. R., Bosma, T. N., De Bruin, W. P., Harms, H., Holliger, C., Rijnaarts, H. H., Tros, M. E., Schraa, G., Zehnder, A. J. (1992). Versatility of soil column experiments to study biodegradation of halogenated compounds under environmental conditions. Biodegradation 3(2-3):265-284.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	647132			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene			
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Water saturated soil column experiment for biodegradation			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR			
Oxygen, pH, and CEC	anaerobic; Not reported; Not reported			
Test Type, Test Temperature, and Test Details	laboratory; Not reported; Soil columns in sediment of Rhine River and Dune infiltration area near Amsterdam; sulfate reducing conditions			
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	other; Not reported; Not reported			
Soil Classification, Microbial Biomass, and Humidity	Not reported; Not reported: Not reported			
Duration, Parameter, System, and Sampling Frequency	Not reported; not specified; Soil column; Not reported			
Control and Blank	Not reported; Not reported			
Concentration	Not reported			
Analytical Method, Analytical Details, and Results Per Degredation Parameter	Not reported; Not reported; % removal			
Results Remarks	Observed degradation			
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results	between 25-90%; Not reported; Not reported; Not reported; Not reported			
Results Details	Not reported			
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 clearly identified.
	Metric 2:	Test Substance Purity	Low	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Uninformative	Concurrent control groups were not 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:	Van Der Meer, J. R., Bosma, T. N., De Bruin, W. P., Harms, H., Holliger, C., Rijnaarts, H. H., Tros, M. E., Schraa, G., Zehnder, A. J. (1992). Versatility of soil column experiments to study biodegradation of halogenated compounds under environmental conditions. Biodegradation 3(2-3):265-284.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	647132			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Low	There were multiple omissions in testing conditions.
	Metric 7:	Testing Consistency	N/A	Not applicable; multiple study groups were not reported.
	Metric 8:	System Type and Design	Medium	Some system design details were not provided; however, this was not likely to have influenced the interpretation of the results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	Microbial biomass 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	Low	Basis for biodegradation not reported; very large range reported.
	Metric 12:	Test Substance Purity	Low	Sampling details were omitted.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	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	Uninformative	Insufficient detail; analytical method not reported; The target chemical concentrations, extraction efficiency, percent recovery, and mass balance were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	Low	No details; degradation kinetics not specified.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Insufficient data; 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**Uninformative**

* Related References: HSDB

Study Citation:	Webber, M. D., Goodin, J. D., Fowlie, P. J., Hong-You, R. L., Legault, J. (1997). Persistence of volatile organic compounds in sludge treated soils. Water Quality Research Journal of Canada 32(3):579-597.
OECD Harmonized Template:	Biodegradation in Soil
HERO ID:	645796

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; other; Experimental; other: Persistence of VOCs in soils inoculated with anaerobically digested sludge using a method developed by the Water Technology International Corporation
Solvent, Reactivity, Storage, Stability	Stock solution in methanol; NR; cold storage in glass bottle with teflon septum cap at 4±2C; NR
Radiolabel, Source, State, Purity	NR; NR; Solution; NR Notes: Stock solution containing DCE, DCB, BEN, ETB, DEB, XYL, TOL, ETL, CHL and TCE
Oxygen, pH, and CEC	aerobic; Vineland 5.4; Caledon 7.2; Conestogo 7.1; Haldimand 6.7; Lincoln 6.0; Muck I 7.2; Muck II 7.0; 9.8-77 cmol/kg
Test Type, Test Temperature, and Test Details	laboratory; 22±2°C; Target compound was spiked into municipal sludge treated soils at 50 mg/kg dry weight; held w/o air for 1h, then air passed through at 50 cm3/min for 4 h followed by intermittent aeration in 24 h intervals
Soil Type, Clay Silts and Organic Carbon, and Bulk Density	sandy loam; Soils ranged from 3-74% sand 16-57% silt 7-50% clay 1.3-12% OC; Not reported
Soil Classification, Microbial Biomass, and Humidity	Vineland: fine sandy loam; Caledon: sandy loam; Conestogo: silt loam; Haldimand: silt loam; Lincoln: silty clay; Muck I and II: silty clay loam; anaerobically digested municipal sludge total solids: 36 g/L; Not reported
Duration, Parameter, System, and Sampling Frequency	288 hours; test mat.; Flask reaction vessel wrapped in foil; gas inlet/outlet, Teflon washer and plastic screw cap; 0.25, 1, 4, 24, 48, 144, 288 hours
Control and Blank	Not reported; Not reported
Concentration	50 mg/kg
Analytical Method, Analytical Details, and Results Per Degredation Parameter	GC-MS/ECD; methanol analysis with GC equipped with autosampler and electron capture detector; half-life (hours)
Results Remarks	Not reported
Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and References Substance Compartment Results	Half-lives (hr) ranged from 52-1926; Vinland: 140, Caldor 52, Conestogo 175, Haldimand 163, Lincoln 322, Muck I 1926, Muck II 1301; R-squared ranged from 0.11-98; p</=0.01 or p</=0.05; Not reported; Not reported; Not reported
Results Details	Not reported
Mean Total Recovery Results and Results Per Recovery	Recoveries were highly variable; specific recovery data for target not reported; VOC recoveries were reduced following 24h, the VOC remaining in the soil was determined by subtracting the recovery at 22°C from the observed total recovery

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
	Metric 1:	Test Substance Identity	High
	Metric 2:	Test Substance Purity	Low
Domain 2: Test Design			
	Metric 3:	Study Controls	Uninformative
			The study did not include or report crucial control groups (no sterile/abiotic/positive control).

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Study Citation:	Webber, M. D., Goodin, J. D., Fowlie, P. J., Hong-You, R. L., Legault, J. (1997). Persistence of volatile organic compounds in sludge treated soils. Water Quality Research Journal of Canada 32(3):579-597.			
OECD Harmonized Template:	Biodegradation in Soil			
HERO ID:	645796			
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 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	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	High	The test organism information/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	Low	The percent loss due to biodegradation and/or volatilization was unclear.
	Metric 12:	Test Substance Purity	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	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	High	This metric met the criteria for high confidence as expected for this type of study.
	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	Medium	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:	Barrows, M. E., Petrocelli, S. R., Macek, K. J., Carroll, J. J. (1980). Bioconcentration and elimination of selected water pollutants by bluegill sunfish (<i>Lepomis macrochirus</i>). :379-392.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	18050

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, and Guideline	None; Experimental; other: Bioconcentration in Bluegill sunfish: Aquarium with well-water and modified continuous-flow proportional dilution apparatus for chemical introduction
Solvent, Reactivity, Storage, Stability	NR; NR; Stored in sealed vial under refrigerated conditions.; NR
Radiolabel, Source, State, Purity	Ring labelled C-14; New England Nuclear, Boston, Massachusetts.; NR; NR
Test Organism and Test Organism Details	Bluegill sunfish (<i>Lepomis macrochirus</i>); Sunfish were obtained from 1) a commercial fish farm in Connecticut. Wet weights: 0.37±0.18 to 0.94±0.34 mm. Lengths: 25±3 to 32±4 mm. 2) commercial farm in Nebraska: Weight: 0.95±0.36 g; Length: 35±4 mm.
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 16±1°C (mean); Measured daily; 7.1; 7 days
Media Type, TOC, and Salinity	natural water; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Initial=>60% of saturation (5.6 mg/L) (measured periodically range 5.9-8.6 mg/L 57-89% sat); Not reported; 35 mg/L as calcium carbonate
Exposure Route, Elimination, and Nominal Measurements	500mL of diluent well water was mixed with stock solution.; t1/2 <1 day; following the apparent equilibrium or 28 d exposure period fish were transferred to pollutant free aquarium; sample days 1, 2, 4, 7; Measured
Test Type, Test Temperature, and Test Condition	flow-through; 16±1°C (mean); Measured daily; Control aquarium which received only well water
Comments	
Duration, Parameter, and Sampling Frequency	14 days; Test: 28 days or until equilibrium; water and fish samples collected periodically until apparent equilibrium was reached or the max exposure of 28 days was reached; DT50; Days 0, 1, 2, 4, 7, 10, and 14.
Concentration	10.1±0.75 µg/L
Analytical Method and Analytical Details	Quantitation of radiolabeled residue using a Packard Model 306 Oxidizer and Model 2002 Packard Tri-Carb Liquid Scintillation Spectrometer; samples collected and prepared according to US EPA.;
Rate Constant and Results per Recovery	Half-life < 1 day; Half-life defined as the period of time required for the mean chemical residue measured in fish at equilibrium to be reduced by half during depuration; Oxidizer: 99-100% recovery; Counting efficiencies: 7.9% counting error at 95% confidence level, decreased as sample activity increased
Statistics, Basis, and Calculation Basis	Not Reported; whole fish; Not Reported
Results Value and Results Details	BCF: 60; BCF is the quotient of the mean measured residues of the compound in whole body fish tissue during the equilibrium period divided by the mean measured concentration of the compound in exposure water.
Metabolites, Reference, and Results Reference Substance	Not Reported; Not Reported; NA (control aquarium used but not discussed other than its use as a baseline)

EVALUATION			
Domain	Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High
	Metric 2:	Test Substance Purity	Medium
			The test substance was identified using common nomenclature.
			The purity of the test substance was not reported; however, the omission is unlikely to have a substantial impact on the study results.
Domain 2: Test Design			

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Study Citation:	Barrows, M. E., Petrocelli, S. R., Macek, K. J., Carroll, J. J. (1980). Bioconcentration and elimination of selected water pollutants by bluegill sunfish (<i>Lepomis macrochirus</i>). :379-392.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	18050			
Domain		Metric	EVALUATION Rating	Comments
	Metric 3:	Study Controls	High	Control aquaria were used without the introduction of the test substance.
	Metric 4:	Test Substance Stability	High	The test substance storage and preparation 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 samples were kept in the same aquarium and subject to the same treatment and conditions.
	Metric 8:	System Type and Design	High	Equilibrium was reported and the system type was appropriate.
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 was described and appropriate for 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 were reported and appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Uncertainty in the concentration measurements were reported and unlikely to impact the study results.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	No adverse health outcomes were reported among the test organisms.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Lipid content and test substance recovery in fish tissue were not reported; however, the omissions are unlikely to have a substantial impact on the study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Kinetic calculations were not clearly described; however, the omissions are unlikely to have a substantial impact on the study results.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study results.

Overall Quality Determination**High**

* Related References: ECHA rating: 2

Study Citation:	Calamari, D., Galassi, S., Setti, F. (1982). Evaluating the hazard of organic substances on aquatic life: the paradichlorobenzene example. Ecotoxicology and Environmental Safety 6(4):369-378.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	4912296

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported; Bioaccumulation in Salmo gairdneri
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Test Organism and Test Organism Details	Salmo gairdneri; Alevin life stage
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 10°C; Not reported; 1 day
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	Water; Transferred to clean water; Measured
Test Type, Test Temperature, and Test Condition	not specified; 10°C; Not reported
Comments	
Duration, Parameter, and Sampling Frequency	7 days; Not Reported; Not reported
Concentration	0.003 - 0.073 mg/L
Analytical Method and Analytical Details	GC-FID with 63Ni electron capture detector; detection limit 0.002 mg/L (aqueous), 100 ug/kg wet wt. (tissue); Dilute aqueous solutions (< 0.5 mg/L) extracted with n-hexane; tissue extracts cleaned up before analysis;
Rate Constant and Results per Recovery	Not applicable; Not reported
Statistics, Basis, and Calculation Basis	Not reported; Tissue wet wt.; steady state
Results Value and Results Details	112, 40, 85; BCFs reported for 0.003, 0.015, and 0.073 mg/L exposure levels; Complete release observed in less than 1 day
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 name.
	Metric 2: Test Substance Purity	Medium	Test substance source and purity were not reported.
Domain 2: Test Design	Metric 3: Study Controls	Medium	Controls were not explicitly included.
	Metric 4: Test Substance Stability	High	Test substance concentrations were reported and monitored frequently during the test.
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:	Calamari, D., Galassi, S., Setti, F. (1982). Evaluating the hazard of organic substances on aquatic life: the paradichlorobenzene example. Ecotoxicology and Environmental Safety 6(4):369-378.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	4912296			
Domain		Metric	EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Medium	Limited test conditions besides temperature were reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
	Metric 8:	System Type and Design	High	Analytical monitoring confirmed the system was capable of maintaining test substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	Medium	Organism species and life stage were reported, no other details were provided.
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 methods were appropriate and frequency was acceptable for the study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability was not addressed by statistical methods, uncertainty was not discussed.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	No effects to organism health were reported.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The analytical method was appropriate, limits of detection were reported. No raw data or extraction efficiency was reported. Lipid content or lipid normalized BCF was not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical and kinetic calculations were not conducted.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable and comparable to previous studies, however, few study details were provided.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

* Related References: ECHA rating: 2

Study Citation:	Calamari, D., Galassi, S., Setti, F. (1982). Evaluating the hazard of organic substances on aquatic life: the paradichlorobenzene example. Ecotoxicology and Environmental Safety 6(4):369-378.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	4912296			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported; Bioaccumulation in Salmo gairdneri			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR			
Test Organism and Test Organism Details	Salmo gairdneri; 1000 eggs			
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 10°C; Not reported; Not reported			
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	Water; Transferred to clean water; Measured			
Test Type, Test Temperature, and Test Condition	flow-through; 10°C; Eggs exposed to the test substance up to the 2-week eating alevin stage			
Comments				
Duration, Parameter, and Sampling Frequency	60 days; Not Reported; 15, 23, 30, 40, 50, 55, and 60d			
Concentration	1.8 - 122 µg/L			
Analytical Method and Analytical Details	GC-FID with 63Ni electron capture detector; detection limit 0.002 mg/L (aqueous), 100 ug/kg wet wt. (tissue); Dilute aqueous solutions (< 0.5 mg/L) extracted with n-hexane; tissue extracts cleaned up before analysis; eggs and embryos homogenated with anhydrous Na2SO4 and extracted 2-3x with n-hexane, filtered and diluted, cleaned on a Florisil column;			
Rate Constant and Results per Recovery	Not applicable; single extraction gave 90% recovery for concentrations 100 to 25,000 ug/kg wet wt.			
Statistics, Basis, and Calculation Basis	Not reported; Tissue wet wt.; steady state			
Results Value and Results Details	Approx. 380, 1400, 250, 300, 160, 160, and 100; Reported at 15 (egg), 23 (hatching), 30, 40, 50, 55, and 60 d (alevin stage), reported for 3 ug/L only			
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 name.
	Metric 2:	Test Substance Purity	Medium	Test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	High	Controls were included, minimal details provided.
	Metric 4:	Test Substance Stability	High	Test substance concentrations were reported and monitored frequently during the test.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Limited test conditions besides temperature were reported.
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Study Citation:		Calamari, D., Galassi, S., Setti, F. (1982). Evaluating the hazard of organic substances on aquatic life: the paradichlorobenzene example. Ecotoxicology and Environmental Safety 6(4):369-378.		
OECD Harmonized Template:		Aquatic Bioconcentration		
HERO ID:		4912296		
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
	Metric 8:	System Type and Design	High	Analytical monitoring confirmed the system was capable of maintaining test substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	Medium	Organism species and life stage were reported, no other details were provided.
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 methods were appropriate and frequency was acceptable for the study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability was not addressed by statistical methods, uncertainty was not discussed.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	No macroscopic or histological changes were observed at hatching, mortality of test groups and controls comparable at 30%.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The analytical method was appropriate, limits of detection were reported. No raw data or extraction efficiency was reported. Lipid content or lipid normalized BCF was not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical and kinetic calculations were not conducted.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable however no previous studies were available for comparison and the study was lacking in details.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

* Related References: ECHA rating: 2

Study Citation:	Carlson, A. R., Kosian, P. A. (1987). Toxicity of chlorinated benzenes to fathead minnows (<i>Pimephales promelas</i>). Archives of Environmental Contamination and Toxicology 16(2):129-135.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	4930931

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported;
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Aldrich Chemical Company; NR; 97% Notes: Concentrations in test vessels measured twice a week from alternating exposure chambers
Test Organism and Test Organism Details	Fathead minnows, <i>Pimephales promelas</i> ; n=30, 3 - 12 hr old embryos; average final weight: 87 - 101%
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 25±2°C; 7.3 - 7.6; Not reported
Media Type, TOC, and Salinity	natural water: freshwater; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	7.3±0.5; Not reported; 44 - 46 mg/L
Exposure Route, Elimination, and Nominal Measurements	Water; Not reported; Measured
Test Type, Test Temperature, and Test Condition	not specified; 25±2°C; Survivorship (at hatch, at end of test): 82% and 93%, 77 and 78%, 78 and 0%, 77 and 0%, 57% and 0%; significantly less than control at 1,000±130 ug/L
Comments	32 days; Not Reported; After hatching, end of test
Duration, Parameter, and Sampling Frequency	570 - 8700 µg/L
Concentration	GC with 63Ni electron capture detector; separated by 3 mm (OD) glass 1.83 m column packed with SP-2250/SP-2401; Water samples extracted with hexane; fish samples homogenized with anhydrous Na2SO4, cleaned up on chromatographic column and eluted with hexane;
Analytical Method and Analytical Details	Not applicable; 107% (water), 99% (tissue)
Rate Constant and Results per Recovery	Dunnett's procedure for identifying significant difference; significance level p=0.05; Whole body; steady state
Statistics, Basis, and Calculation Basis	BCF: 110; Average BCF. Mean tissue residue: 69.5 and 103 ug/g for 570±67 ug/L and 1,000±130 ug/L exposure groups. BCF increased with increased chlorination of the chlorobenzenes studied.
Results Value and Results Details	Not reported; Control (19±5 ug/L); Mean tissue residue: 6.8 ug/g; survivorship (at hatch, at end of test): 78, 95%
Metabolites, Reference, and Results Reference Substance	

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 purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	Controls were included and results were within an appropriate range.
	Metric 4:	Test Substance Stability	High	Test substance concentrations were reported and analytically monitored throughout the test.
Domain 3: Test Conditions				

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Study Citation:	Carlson, A. R., Kosian, P. A. (1987). Toxicity of chlorinated benzenes to fathead minnows (Pimephales promelas). Archives of Environmental Contamination and Toxicology 16(2):129-135.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	4930931			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method is suitable for the test substance.
	Metric 6:	Testing Conditions	High	Test conditions (temperature, pH, hardness, etc.) were reported and appropriate.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups and samples.
	Metric 8:	System Type and Design	High	The system was capable of maintaining test substance concentrations based on analytical monitoring.
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 organism species, starting age, and weight were reported.
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 and address the outcomes of interest.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability was addressed by statistical techniques between replicates.
	Metric 14:	Health Outcomes Unrelated to Exposure	Medium	Survivorship was significantly affected at 1,000 ug/L, mean tissue residue was not measured above this concentration.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Raw data was reported, the analytical method was appropriate, percent recovery was reported and tissue concentration was corrected based on recovery. BCF calculation basis was not reported, it's not clear if average BCF includes the significantly lower surviving group.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods were reported and applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable based on the method, however it's unclear if the reported BCF includes the significantly lower surviving group.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

* Related References: ECHA rating: 2

Study Citation:	Chaisusant, Y., Yu, Q., Connell, D. W. (1997). Bioconcentration of bromo- and chlorobenzenes by fish (<i>Gambusia affinis</i>). Water Research 31(1):61-68.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	4930947

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported; bioconcentration factor, uptake and elimination rate constant determination for mixture of chloro- and bromobenzenes
Solvent, Reactivity, Storage, Stability	Acetone stock solution; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Aldrich Chemical Company; NR; >97% Notes: Mixture of other chloro- and bromobenzenes
Test Organism and Test Organism Details	Mosquito fish, <i>Gambusia affinis</i> ; Male and female, n=300, 2.75±0.32 cm length, 1.90±0.06 mg weight
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 23.1°C; 7.6±0.2; 6, 12, 24, 48, and 96 h
Media Type, TOC, and Salinity	not specified; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	9.4±0.2 ppm (beginning) and 8.5±0.3 ppm (end of renewal); Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Water; Fish exposed for 96 h, placed in clean water which was renewed every 24 h, and sampled at 6, 12, 24, 48, and 96 h; Measured
Test Type, Test Temperature, and Test Condition	semi-static; 23.1°C; 10 fish / 5 L jar, test solution renewed in 12 h intervals
Comments	
Duration, Parameter, and Sampling Frequency	96 hours; Not Reported; 12, 24, 36, 48, 96 h
Concentration	57.0±4.1 - 233.0±23.9 µg/L
Analytical Method and Analytical Details	Gas chromatograph with ⁶³ Ni electron capture detector, analytes separated on fused silica capillary column 30 m by 0.25 mm ID; Organism samples homogenized with anhydrous sodium sulfate, filtered with GF/C glass fibers, washed and extracted with hexane, concentrated under N stream in a water bath, analyte fractions separated by Florisil column eluted with diethyl ether in hexane;
Rate Constant and Results per Recovery	First-order (r ² > 0.90) Uptake: 112±20 / d (based on wet wt.), 3500±400 / d (based on lipid wt.); Elimination: 1.44±0.55 / d (based on wet wt.), 1.50±0.67 / d (based on lipid wt.); 72% (tissue)
Statistics, Basis, and Calculation Basis	Not Reported; Wet wt. and Lipid normalized; kinetic
Results Value and Results Details	BCF: 78±12 (wet wt.), 2500±6800 (lipid wt.); Uptake and elimination rate constants and BCFs observed to be related to log K _{ow} ranging from 3 to 6. log k (lipid)=7.49 + 0.61 log (DL*BCF(lipid)) where DL=lipid-phase diffusivity
Metabolites, Reference, and Results Reference Substance	Not reported; Controls (exposed to 20 ppm acetone); Test substance not detected, no mortalities

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 purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	Controls were included and the test substance was not detected in organism tissue.
	Metric 4:	Test Substance Stability	High	Test substance preparation (in acetone) and measured concentrations were reported.

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Study Citation:	Chaisusant, Y., Yu, Q., Connell, D. W. (1997). Bioconcentration of bromo- and chlorobenzenes by fish (<i>Gambusia affinis</i>). Water Research 31(1):61-68.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	4930947			
		EVALUATION		
Domain	Metric	Rating	Comments	
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was appropriate for the test substance.
	Metric 6:	Testing Conditions	High	Appropriate testing conditions were reported (temperature, pH, DO).
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
	Metric 8:	System Type and Design	High	Test solution was renewed frequently and the solution concentrations were verified analytically.
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	Test organism species, sex, and body size were reported.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed the outcomes of interest.
	Metric 12:	Test Substance Purity	Medium	Sampling methods for organisms were reported and conducted at an appropriate frequency; sampling methods/extraction methods for water were not reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability was addressed by statistical techniques. Test substance was applied as a mixture of chloro- and bromobenzenes, the impact of which to results is uncertain.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	No differences in organism health were reported.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The analytical method was appropriate, percent recovery for organism samples was reported; limits of detection were not reported. Lipid-normalized BCF was reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	The kinetic calculations for rate constants were described and applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable and comparable to previous studies; test substance a mixture of chloro- and bromobenzenes which may be less reliable than a pure-substance derived value.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

* Related References: HSDB

Study Citation:	De Peyster, A., Donohoe, R., Slymen, D. J., Froines, J. R., Olivieri, A. W., Eisenberg, D. M. (1993). Aquatic biomonitoring of reclaimed water for potable use: The San Diego health effects study. Journal of Toxicology and Environmental Health 39(1):121-141.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	657957			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene			
Confidentiality, Type, and Guideline	None; Experimental; other: ASTM 1985 Standard Practice for Conducting Bioconcentration Tests with Fishes and Saltwater Bivalve Mollusks			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; Contaminated waters; NR; NR Notes: Detected in advanced wastewater treatment facility (AWT water) and a Water Treatment facility (Miramar water); standards used for analytical method not reported.			
Test Organism and Test Organism Details	Pimephales promelas; Juvenile fathead minnows			
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 22±1°C; 7.48 (AWT water); 8.25 (Miramar water); Not reported			
Media Type, TOC, and Salinity	other; Not reported; Not reported			
Dissolved Oxygen, Conductivity, and Hardness	≥ 60% (5.6 mg/L); 210 (AWT water); 813 (Miramar water); As CaCO3: 32 mg/L (AWT water); 245 mg/L (Miramar water)			
Exposure Route, Elimination, and Nominal Measurements	Contaminated waters; target analyte concentration not reported; Not reported; Measured			
Test Type, Test Temperature, and Test Condition	flow-through; 22±1°C; Bioaccumulation of contaminants over a 28-d period using water from and advanced wastewater treatment facility (AWT water) and a Water Treatment facility (Miramar water)			
Comments				
Duration, Parameter, and Sampling Frequency	28 days; other; 0, 7, 14, and 28 days			
Concentration	Not Reported			
Analytical Method and Analytical Details	Method 625 base/neutral/acid extraction (B/N/A); Target analyte measured above the detection limit of 1 ug/L in fish samples exposed to water sources;			
Rate Constant and Results per Recovery	Not reported; Specific concentrations in source waters not reported; trace amount may be present in extraction solvent blanks			
Statistics, Basis, and Calculation Basis	p <0.05; BMDP Statistical Software was used for data analysis; other; other			
Results Value and Results Details	0% (AWT water); 0% (Miramar water); Percentage of samples above DL (1 ug/kg)			
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 definitively.
	Metric 2:	Test Substance Purity	High	The test substance source was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Uninformative	Controls included; however, no results were reported and concentrations of analytes in controls were not measured/reported. It was reported that analytical blanks contained trace amounts of certain chemicals such as phthalates.
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.
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Study Citation:	De Peyster, A., Donohoe, R., Slymen, D. J., Froines, J. R., Olivieri, A. W., Eisenberg, D. M. (1993). Aquatic biomonitoring of reclaimed water for potable use: The San Diego health effects study. Journal of Toxicology and Environmental Health 39(1):121-141.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	657957			
Domain	Metric	EVALUATION		Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	A standard method was reported.
	Metric 6:	Testing Conditions	High	The testing conditions were appropriate for the method.
	Metric 7:	Testing Consistency	High	The test conditions were consistent across samples or study groups. The conditions of the exposure were documented.
	Metric 8:	System Type and Design	High	The system design details were appropriate.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	Medium	The test organism was a standard species; however, prior contamination from plastic shipping bags noted but was not quantified.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Uninformative	There was incomplete reporting of outcome assessment method; BCF or BAF value was not reported. Concentration ranges detected in fish were reported and the water concentrations were not reported.
	Metric 12:	Test Substance Purity	High	The reported sampling details were appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Uninformative	Prior contamination from plastic shipping bags noted but not assessed or quantified; trace contamination in analytical blanks.
	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	Additional detail would proved support; however, the outcome, quantitative results for bioaccumulation, were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical analysis reported and acceptable.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Uninformative	Quantitative results for bioaccumulation were not reported.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		Uninformative		

Study Citation:	Dow Chemical, (1982). A dynamic toxicity study of p-dichlorobenzene to bluegill.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	4929941

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported; Flow-through bioaccumulation in fish
Solvent, Reactivity, Storage, Stability	50/40 acetone/distilled water; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; Technical grade
Test Organism and Test Organism Details	Bluegill fish, <i>Lepomis macrochirus</i> ; n =24 per concentration, 3-4" long, collected from Turtle Pond, Sanford, Michigan
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 50 deg F; Not reported; 1 week
Media Type, TOC, and Salinity	natural water: freshwater; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Water; Organisms exposed for 10 wk transferred to fresh water for 1 week.; Nominal: 0.5, 0.9, 1.6, 2.8, and 5.0 ppm; Measured: 0.41±0.2, 0.67±0.30, 1.04±0.44 ppm (10 wk average), 1.3, and 2.0 ppm (1 wk determinations)
Test Type, Test Temperature, and Test Condition	flow-through; 50 deg F; Two liter discharge per concentration, 6.5 min discharge cycle used, resulting in approximately 16 volume turnovers per 24 hr.
Comments	Up to 10 wk; Not Reported; 24 hours (5.0 ppm); 96 hours and 1 week (2.8 ppm); 1, 3, 4, 8, 10 weeks (0.5 - 1.6 ppm)
Duration, Parameter, and Sampling Frequency	Not Reported
Concentration	Infrared (water samples), gas chromatography electron capture (organism samples); Limit of detection: 0.1 ppm (water), 0.2 ppm (fish);
Analytical Method and Analytical Details	Not reported; Not reported
Rate Constant and Results per Recovery	Not reported; Tissue; steady state
Statistics, Basis, and Calculation Basis	BCF=11.7, 7.8, 7.1 (10 wk), 11.7 (96 hr) and 14.8 (1 wk), 4.8 (24 hr); Reported for nominal concentrations 0.5, 0.9, 1.6, 2.8, and 5.0 ppm, respectively. Organism concentrations: 4.8, 5.2, 7.4 (10 wk), 19.2 (1 wk) and 15.2 (95 hr), and 9.6 ppm (24 hr) per exposure group respectively.
Results Value and Results Details	Tissue concentration not detected after 1 wk elimination period for all groups.
Metabolites, Reference, and Results Reference Substance	Not reported; Control (0 ppm exposure); < 0.2 pm in fish

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, qualitative purity was reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	Controls were included, both water and organism concentrations were not detected.
	Metric 4:	Test Substance Stability	High	The test substance solvent and starting concentrations were reported, storage conditions were not reported. Concentrations were analytically verified.
Domain 3: Test Conditions				

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Study Citation:	Dow Chemical, (1982). A dynamic toxicity study of p-dichlorobenzene to bluegill.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	4929941			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	No water characteristics except for temperature 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 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	High	The organism species, length, and source were reported.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining bioaccumulation.
	Metric 12:	Test Substance Purity	Medium	Sampling methods or preparation were not reported, sampling frequency was acceptable.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Limited sampling and analytical details were reported.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	No mortality or health effects were observed in the organisms.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The analytical methods were reported generally; limits of detection were reported, extraction efficiency was not reported. Results were not lipid normalized and lipid content was 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	Medium	The results were reasonable based on the method but sampling and analytical details were lacking and results were not compared to previous studies.
	Metric 18:	QSAR Models	N/A	Not applicable.
Overall Quality Determination			High	

Study Citation:	EC, (2003). Follow-up report on five PSL1 substances for which there was insufficient information to conclude whether the substances constitute a danger to the environment: 1,2-dichlorobenzene; 1,4-dichlorobenzene; trichlorobenzenes; tetrachlorobenzenes; pentachlorobenzene.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	5176389

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene
Confidentiality, Type, and Guideline	no; not specified; other: not reported
Solvent, Reactivity, Storage, Stability	Not Reported; Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, Purity	Not Reported; Not Reported; Not Reported; Not Reported
Test Organism and Test Organism Details	rainbow trout; 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	Not Reported; Not Reported; Not Reported
Comments	
Duration, Parameter, and Sampling Frequency	Not Reported; BCF; 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	370-1400; 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.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Some concurrent control group details were not included; however, more study details expected to be in the primary source.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, more study details expected to be in the primary source.
Domain 3: Test Conditions				

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Study Citation:	EC, (2003). Follow-up report on five PSL1 substances for which there was insufficient information to conclude whether the substances constitute a danger to the environment: 1,2-dichlorobenzene; 1,4-dichlorobenzene; trichlorobenzenes; tetrachlorobenzenes; pentachlorobenzene.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	5176389			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	Medium	Study details not reported but expected to be appropriate. More details expected in the primary source.
	Metric 6:	Testing Conditions	Medium	Testing conditions not reported but expected to be appropriate. More details expected in the primary source.
	Metric 7:	Testing Consistency	Medium	Testing conditions not reported but expected to be consistent. More details expected in the primary source.
	Metric 8:	System Type and Design	Medium	The system type and design were not reported but expected to be appropriate. More details expected in the primary source.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to the study.
	Metric 10:	Sampling Methods	Medium	Test organism information was not reported. More details expected in the primary source.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	No methodology was reported but more data expected to be in the primary source.
	Metric 12:	Test Substance Purity	Medium	No sampling method reported but expected to be appropriate. More details expected in the primary source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	More details expected to be available in the primary source.
	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	Medium	No analytical method reported but expected to be appropriate. More details expected to be in the primary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.
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.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.

Overall Quality Determination**Medium**

* Related References: Secondary source citing secondary source; cited from Government of Canada. 1993b. Canadian Environmental Protection Act Priority Substances List Assessment Report: 1,4-Dichlorobenzene. Environment Canada and Health Canada, Ottawa, Ontario. 30 pp.

Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	5017839			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene			
Confidentiality, Type, and Guideline	no; not specified; other: not specified			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR			
Test Organism and Test Organism Details	Poecilia reticulata; NR			
Lipid Content, Test Temperature, pH, and Depuration Time	6.5 %; NR; NR; NR			
Media Type, TOC, and Salinity	NR; NR; NR			
Dissolved Oxygen, Conductivity, and Hardness	NR; NR; NR			
Exposure Route, Elimination, and Nominal Measurements	NR; NR; NR			
Test Type, Test Temperature, and Test Condition	flow-through; NR; NR			
Comments				
Duration, Parameter, and Sampling Frequency	20 days; BCF; NR			
Concentration	NR NR - NR NR NR			
Analytical Method and Analytical Details	NR; NR;			
Rate Constant and Results per Recovery	NR; NR			
Statistics, Basis, and Calculation Basis	NR; NR; NR			
Results Value and Results Details	BCF=98; Not Reported			
Metabolites, Reference, and Results Reference Substance	NR; NR; NR			
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	Medium	Test substance purity and source were not reported; more information may be in the source cited.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Concurrent control groups were not reported; more information may be in the source cited.
	Metric 4:	Test Substance Stability	Medium	Test substance stability was not reported; more information may be in the source cited.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	The test method was not reported; more information may be in the source cited.
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Study Citation:		ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.		
OECD Harmonized Template:		Aquatic Bioconcentration		
HERO ID:		5017839		
Domain	Metric	EVALUATION		Comments
	Metric 6:	Testing Conditions	Medium	The testing conditions were not reported; more information may be in the source cited.
	Metric 7:	Testing Consistency	Medium	The testing conditions were not reported; more information may be in the source cited.
	Metric 8:	System Type and Design	Medium	The system design was not reported; more information may be in the source cited.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type
	Metric 10:	Sampling Methods	Medium	Some information on the test organism was reported; more information may be in the source cited.
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	Sampling method was not reported; more information may be in the source cited.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables were not reported; more information may be in the source cited.
	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	Medium	Analytical method was not reported; more information may be in the source cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results were reasonable
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.
Overall Quality Determination			Medium	

* Related References: Cites secondary source Gobas et al. 1991 (HERO ID 1982466)

Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	5017839			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene			
Confidentiality, Type, and Guideline	no; experimental; other: not specified			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR			
Test Organism and Test Organism Details	Oncorhynchus mykiss; trout were 10 weeks old			
Lipid Content, Test Temperature, pH, and Depuration Time	NR; NR; NR; NR			
Media Type, TOC, and Salinity	other: Rhine water; NR; NR			
Dissolved Oxygen, Conductivity, and Hardness	NR; NR; NR			
Exposure Route, Elimination, and Nominal Measurements	NR; NR; NR			
Test Type, Test Temperature, and Test Condition	aerated flow-through; NR; NR			
Comments				
Duration, Parameter, and Sampling Frequency	10 months; BCF; NR			
Concentration	NR NR - NR NR NR			
Analytical Method and Analytical Details	NR; Detection Limit=0.5 µg/L; all analytical values of the Rhine water were below the detection limit;			
Rate Constant and Results per Recovery	NR; NR			
Statistics, Basis, and Calculation Basis	NR; other: fresh weight; NR			
Results Value and Results Details	BCF >20 for muscle meat; BCF >200 for intestines; >80 for whole fish; detected 100 µg in intestines and 10 µg in muscle meat/(kg FW=fresh weight). whole fish BCF was estimated assuming intestines amount to 1/3 of fresh weight of fish.			
Metabolites, Reference, and Results Reference Substance	NR; NR; NR			
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	Medium	Test substance purity and source were not reported; more information may be in the source cited.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Concurrent control groups were not reported; more information may be in the source cited.
	Metric 4:	Test Substance Stability	Medium	Test substance stability was not reported; more information may be in the source cited.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	Medium	The test method was not reported; more information may be in the source cited.
	Metric 6:	Testing Conditions	Medium	The testing conditions were not reported; more information may be in the source cited.
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Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	5017839			
Domain	Metric	EVALUATION		Comments
	Metric 7:	Testing Consistency	Medium	The testing conditions were not reported; more information may be in the source cited.
	Metric 8:	System Type and Design	Medium	The system design was not reported; more information may be in the source cited.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type
	Metric 10:	Sampling Methods	Medium	Some information on the test organism was reported; more information may be in the source cited.
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	Sampling method was not reported; more information may be in the source cited.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables were not reported; more information may be in the source cited.
	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	Medium	Analytical method was not reported; more information may be in the source cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results were reasonable
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.
Overall Quality Determination			Medium	

* Related References: Cites secondary source LWA (1989). Landesamt für Wasser und Abfall, Nordrhein-Westfalen; Gewässergutebericht '89. (Not in HERO at the time of extraction).

Study Citation:	Freitag, D., Ballhorn, L., Geyer, H., Korte, F. (1985). Environmental hazard profile of organic chemicals: An experimental method for the assessment of the behaviour of organic chemicals in the ecosphere by means of simple laboratory tests with 14C labelled chemicals. Chemosphere 14(10):1589-1616.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	85251			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported; bioaccumulation			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	14-C labelled; Synthesized by the study laboratory; NR; >98% Notes: Reported generally for the 100 chemicals investigated by the study.			
Test Organism and Test Organism Details	Golden Ide fish; Not reported			
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; Not reported; Not reported; Not reported			
Media Type, TOC, and Salinity	other; Not reported; Not reported			
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported			
Exposure Route, Elimination, and Nominal Measurements	Water; Not reported; Nominal			
Test Type, Test Temperature, and Test Condition	not specified; Not reported; Not Reported			
Comments				
Duration, Parameter, and Sampling Frequency	3 days; Not Reported; Not reported			
Concentration	0.05 mg/L			
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; wet weight; steady state			
Results Value and Results Details	BCF=50; Not reported			
Metabolites, Reference, and Results Reference	Not reported; Not reported; Not reported			
Substance				
EVALUATION				
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	Low	No information was provided about the test substance other than a statement indicating that some test substances were bought and some were synthesized in the lab.
	Metric 2:	Test Substance Purity	Low	The source and purity of the test substance were not explicitly reported or verified by analytical means.
Domain 2: Test Design				
	Metric 3:	Study Controls	Uninformative	No information was provided regarding this metric.
	Metric 4:	Test Substance Stability	N/A	No information was provided regarding this metric.
Domain 3: Test Conditions				
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Study Citation:	Freitag, D., Ballhorn, L., Geyer, H., Korte, F. (1985). Environmental hazard profile of organic chemicals: An experimental method for the assessment of the behaviour of organic chemicals in the ecosphere by means of simple laboratory tests with 14C labelled chemicals. Chemosphere 14(10):1589-1616.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	85251			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	N/A	No information was provided but may be available in referenced sources.
	Metric 6:	Testing Conditions	Uninformative	No information was provided regarding this metric.
	Metric 7:	Testing Consistency	N/A	No information was provided regarding this metric.
	Metric 8:	System Type and Design	N/A	No information was provided but may be available in referenced sources.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	Medium	The test organism or species is routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	N/A	There was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	Metric 12:	Test Substance Purity	N/A	No information was provided but may be available in referenced sources.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	No confounding variables were noted.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	No information was provided.
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	N/A	Little to no statistical methods and kinetic calculation information was provided.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	N/A	Little to no information was provided; therefore, it was difficult to interpret the results.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination**Uninformative**

Study Citation:	Freitag, D., Ballhorn, L., Geyer, H., Korte, F. (1985). Environmental hazard profile of organic chemicals: An experimental method for the assessment of the behaviour of organic chemicals in the ecosphere by means of simple laboratory tests with 14C labelled chemicals. Chemosphere 14(10):1589-1616.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	85251			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported; bioaccumulation			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	14-C labelled; Synthesized by the study laboratory; NR; >98% Notes: Reported generally for the 100 chemicals investigated by the study.			
Test Organism and Test Organism Details	Algae, Chlorella fusca; Not reported			
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; Not reported; Not reported; Not reported			
Media Type, TOC, and Salinity	other; Not reported; Not reported			
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported			
Exposure Route, Elimination, and Nominal Measurements	Water; Not reported; Nominal			
Test Type, Test Temperature, and Test Condition	not specified; Not reported; Not Reported			
Comments				
Duration, Parameter, and Sampling Frequency	1 day; Not Reported; Not reported			
Concentration	0.05 mg/L			
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; wet weight; steady state			
Results Value and Results Details	BCF=90; 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	Low	No information was provided about the test substance other than a statement indicating that some test substances were bought and some were synthesized in the lab.
	Metric 2:	Test Substance Purity	Low	The source and purity of the test substance were not explicitly reported or verified by analytical means.
Domain 2: Test Design				
	Metric 3:	Study Controls	Uninformative	No information was provided regarding this metric.
	Metric 4:	Test Substance Stability	N/A	No information was provided regarding this metric.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	N/A	No information was provided but may be available in referenced sources.
	Metric 6:	Testing Conditions	Uninformative	No information was provided regarding this metric.
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Study Citation:	Freitag, D., Ballhorn, L., Geyer, H., Korte, F. (1985). Environmental hazard profile of organic chemicals: An experimental method for the assessment of the behaviour of organic chemicals in the ecosphere by means of simple laboratory tests with 14C labelled chemicals. Chemosphere 14(10):1589-1616.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	85251			
Domain		Metric	EVALUATION Rating	Comments
	Metric 7:	Testing Consistency	N/A	No information was provided regarding this metric.
	Metric 8:	System Type and Design	N/A	No information was provided but may be available in referenced sources.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	Medium	The test organism or species is routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	N/A	There was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	Metric 12:	Test Substance Purity	N/A	No information was provided but may be available in referenced sources.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	No confounding variables were noted.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	No information was provided.
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	N/A	Little to no statistical methods and kinetic calculation information was provided.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	N/A	Little to no information was provided; therefore, it was difficult to interpret the results.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination**Uninformative**

Study Citation:	Galassi, S., Calamari, D., Setti, F. (1982). Uptake and release of p-dichlorobenzene in early life stages of <i>Salmo gairdneri</i> . <i>Ecotoxicology and Environmental Safety</i> 6(5):439-447.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	4908833

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-DCB
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	Aqueous saturated solution; NR; NR; Stable concentrations in treatment water
Radiolabel, Source, State, Purity	NA; NR; Liquid; NR
Test Organism and Test Organism Details	<i>Salmo gairdneri</i> , eggs; n=100, wet wt per specimen 73.9 (2 days after fertilization), 76.3 (8 days after fertilization), 75.1 mg (20 days after fertilization)
Lipid Content, Test Temperature, pH, and Depuration Time	3.4% (2 days after fertilization), 2.8% (8 days after fertilization), 4.0% (20 days after fertilization); 10°C; Not reported; Not reported
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	Water; Not reported; Measured, relative standard error 7 - 15%
Test Type, Test Temperature, and Test Condition	flow-through; 10°C; Organisms exposed to test substance solution at flowrate 600 mL/min
Comments	
Duration, Parameter, and Sampling Frequency	20 days; DT50; 0, 2, 8, and 20 d
Concentration	16.4 - 79.5 µg/L
Analytical Method and Analytical Details	GC-FID with a 63Ni ECD; detection limit 0.002 mg/L (aqueous solution), 100 ug/kg wet wt. (organism); Eggs homogenized with anhydrous Na ₂ SO ₄ and extracted 2-3x with n-hexane, cleaned up on a Florisil column, eluted with n-hexane; aqueous solutions extracted with n-hexane;
Rate Constant and Results per Recovery	At 79.3 ug/L: K ₁ , uptake= 22 / hr, K ₂ , release=0.00013 / hr; at 16.4 ug/L, K ₁ , uptake=26 / hr, K ₂ , release=0.0014 / hr; 90% (first extraction, organism concentrations 100 - 25,000 ug/kg wet wt.)
Statistics, Basis, and Calculation Basis	Not reported; Wet wt., lipid normalized; kinetic
Results Value and Results Details	DT50=531 and 493 hr; DT50 reported for water concentrations of 79.5 and 16.4 ug/L; Organism concentrations: 1355E3 and 303E3 ug/kg lipid
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 name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Concurrent negative controls were included, the results were not reported except for organism health.
	Metric 4:	Test Substance Stability	High	Test substance preparation was reported and appropriate, concentrations were verified analytically and had low variability.

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Study Citation:	Galassi, S., Calamari, D., Setti, F. (1982). Uptake and release of p-dichlorobenzene in early life stages of Salmo gairdneri. Ecotoxicology and Environmental Safety 6(5):439-447.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	4908833			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was appropriate for the test substance.
	Metric 6:	Testing Conditions	Medium	No tank conditions besides temperature were reported for the study.
	Metric 7:	Testing Consistency	Medium	Exposure concentrations and durations were consistent across study groups, other conditions were not reported and consistency cannot be verified.
	Metric 8:	System Type and Design	High	The flow through system was capable of maintaining test substance concentrations, which were verified analytically.
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 organism species, life stage and mass were reported and are used for similar study types.
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 methods were appropriate and conducted at an appropriate frequency to calculate rate constants.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability and uncertainty was not explicitly addressed.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	Mortality (< 30%) was comparable across all study groups and no abnormalities were observed during histological examination of embryos.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The analytical method was appropriate. Limits of detection and percent recovery were reported. Bioaccumulation was lipid normalized.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were described and conducted appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results are reasonable based on the method and in agreement with findings from other studies.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

* Related References: ECHA rating: 2

Study Citation:	Galassi, S., Calamari, D., Setti, F. (1982). Uptake and release of p-dichlorobenzene in early life stages of <i>Salmo gairdneri</i> . <i>Ecotoxicology and Environmental Safety</i> 6(5):439-447.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	4908833

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-DCB
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	Aqueous saturated solution; NR; NR; Stable concentrations in treatment water
Radiolabel, Source, State, Purity	NA; NR; Liquid; NR
Test Organism and Test Organism Details	<i>Salmo gairdneri</i> , Alevins; n=100, wet wt per specimen 10.96 mg; 56 days after egg fertilization
Lipid Content, Test Temperature, pH, and Depuration Time	2.3%; 10°C; Not reported; 24 hours
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	Water; Organisms transferred to clean water; Measured, relative standard error 7 - 15%
Test Type, Test Temperature, and Test Condition	flow-through; 10°C; Organisms exposed to test substance solution at flowrate 600 mL/min
Comments	
Duration, Parameter, and Sampling Frequency	56 days; DT50; 0, 2, 8, and 20 d
Concentration	14.6 - 73.2 µg/L
Analytical Method and Analytical Details	GC-FID with a 63Ni ECD; detection limit 0.002 mg/L (aqueous solution), 100 µg/kg wet wt. (organism); Eggs homogenized with anhydrous Na ₂ SO ₄ and extracted 2-3x with n-hexane, cleaned up on a Florisil column, eluted with n-hexane; aqueous solutions extracted with n-hexane; At 73.2 µg/L: K1, uptake= 460 / hr, K2, release=0.17 / hr; at 14.6 µg/L, K1, uptake=390 / hr, K2, release=0.11 / hr; 90% (first extraction, organism concentrations 100 - 25,000 µg/kg wet wt.)
Rate Constant and Results per Recovery	
Statistics, Basis, and Calculation Basis	Not reported; Wet wt., lipid normalized; other
Results Value and Results Details	DT50=4 and 4 hr; DT50 reported for water concentrations of 73.2 and 14.6 µg/L; Organism concentrations: 200E3 and 52E3 µg/kg lipid
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 name.
	Metric 2: Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design	Metric 3: Study Controls	Medium	Concurrent negative controls were included, the results were not reported except for organism health.
	Metric 4: Test Substance Stability	High	Test substance preparation was reported and appropriate, concentrations were verified analytically and had low variability.
Domain 3: Test Conditions	Metric 5: Test Method Suitability	High	The test method was appropriate for the test substance.

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Study Citation:		Galassi, S., Calamari, D., Setti, F. (1982). Uptake and release of p-dichlorobenzene in early life stages of Salmo gairdneri. Ecotoxicology and Environmental Safety 6(5):439-447.		
OECD Harmonized Template:		Aquatic Bioconcentration		
HERO ID:		4908833		
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 6:	Testing Conditions	Medium	No tank conditions besides temperature were reported for the study.
	Metric 7:	Testing Consistency	Medium	Exposure concentrations and durations were consistent across study groups, other conditions were not reported and consistency cannot be verified.
	Metric 8:	System Type and Design	High	The flow through system was capable of maintaining test substance concentrations, which were verified analytically.
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 organism species, life stage and mass were reported and are used for similar study types.
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 methods were appropriate and conducted at an appropriate frequency to calculate rate constants.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability and uncertainty was not explicitly addressed.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	Mortality (< 30%) was comparable across all study groups and no abnormalities were observed during histological examination of embryos.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The analytical method was appropriate. Limits of detection and percent recovery were reported. Bioaccumulation was lipid normalized.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were described and conducted appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results are reasonable based on the method and in agreement with findings from other studies.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

* Related References: ECHA rating: 2

Study Citation:	Galassi, S., Calamari, D., Setti, F. (1982). Uptake and release of p-dichlorobenzene in early life stages of Salmo gairdneri. Ecotoxicology and Environmental Safety 6(5):439-447.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	4908833			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; p-DCB			
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported			
Solvent, Reactivity, Storage, Stability	Aqueous saturated solution; NR; NR; Stable concentrations in treatment water			
Radiolabel, Source, State, Purity	NA; NR; Liquid; NR			
Test Organism and Test Organism Details	Salmo gairdneri, Eggs; n=100, wet wt per specimen 76.3 mg; 8 days after egg fertilization			
Lipid Content, Test Temperature, pH, and Depuration Time	2.8%; 10°C; Not reported; 24 hours			
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	Water; Organisms transferred to clean water; Measured, relative standard error 7 - 15%			
Test Type, Test Temperature, and Test Condition	flow-through; 10°C; Organisms exposed to test substance solution at flowrate 600 mL/min			
Comments				
Duration, Parameter, and Sampling Frequency	48 hours; other; 24, 48 h exposure, 24 h depuration			
Concentration	4.5 - 65.5 µg/L			
Analytical Method and Analytical Details	GC-FID with a 63Ni ECD; detection limit 0.002 mg/L (aqueous solution), 100 ug/kg wet wt. (organism); Eggs homogenized with anhydrous Na2SO4 and extracted 2-3x with n-hexane, cleaned up on a Florisil column, eluted with n-hexane; aqueous solutions extracted with n-hexane;			
Rate Constant and Results per Recovery	Not applicable; 90% (first extraction, organism concentrations 100 - 25,000 ug/kg wet wt.)			
Statistics, Basis, and Calculation Basis	Not reported; Wet wt., lipid normalized; other			
Results Value and Results Details	BCF=17000; 24 h concentration factors (exposure 65.6, 13.4, and 4.5 ug/L): 12.0, 30.1, N.D.48 h concentration factors (exposure 65.6, 13.4, and 4.5 ug/L): 32.1, 55.1, 24.824 h depuration % release (exposure 65.6, 13.4, and 4.5 ug/L): 16.6, 23.5, 0%			
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 name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Concurrent negative controls were included, the results were not reported except for organism health.
	Metric 4:	Test Substance Stability	High	Test substance preparation was reported and appropriate, concentrations were verified analytically and had low variability.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was appropriate for the test substance.
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Study Citation:	Galassi, S., Calamari, D., Setti, F. (1982). Uptake and release of p-dichlorobenzene in early life stages of Salmo gairdneri. Ecotoxicology and Environmental Safety 6(5):439-447.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	4908833			
Domain		Metric	EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Medium	No tank conditions besides temperature were reported for the study.
	Metric 7:	Testing Consistency	Medium	Exposure concentrations and durations were consistent across study groups, other conditions were not reported and consistency cannot be verified.
	Metric 8:	System Type and Design	High	The flow through system was capable of maintaining test substance concentrations, which were verified analytically.
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 organism species, life stage and mass were reported and are used for similar study types.
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 methods were appropriate and conducted at an appropriate frequency to calculate rate constants.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability and uncertainty was not explicitly addressed.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	Mortality (< 30%) was comparable across all study groups and no abnormalities were observed during histological examination of embryos.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The analytical method was appropriate. Limits of detection and percent recovery were reported. Bioaccumulation was lipid normalized.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were described and conducted appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results are reasonable based on the method and in agreement with findings from other studies.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

* Related References: ECHA rating: 2

Study Citation:	Galassi, S., Calamari, D., Setti, F. (1982). Uptake and release of p-dichlorobenzene in early life stages of Salmo gairdneri. Ecotoxicology and Environmental Safety 6(5):439-447.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	4908833

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-DCB
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	Aqueous saturated solution; NR; NR; Stable concentrations in treatment water
Radiolabel, Source, State, Purity	NA; NR; Liquid; NR
Test Organism and Test Organism Details	Salmo gairdneri, Eggs; n=100, wet wt per specimen 10.96 mg; 56 days after egg fertilization
Lipid Content, Test Temperature, pH, and Depuration Time	1.7%; 10°C; Not reported; 24 hours
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	Water; Organisms transferred to clean water; Measured, relative standard error 7 - 15%
Test Type, Test Temperature, and Test Condition	flow-through; 10°C; Organisms exposed to test substance solution at flowrate 600 mL/min
Comments	
Duration, Parameter, and Sampling Frequency	48 hours; other; 24, 48 h exposure, 24 h depuration
Concentration	4.5 - 65.5 µg/L
Analytical Method and Analytical Details	GC-FID with a 63Ni ECD; detection limit 0.002 mg/L (aqueous solution), 100 ug/kg wet wt. (organism); Eggs homogenized with anhydrous Na2SO4 and extracted 2-3x with n-hexane, cleaned up on a Florisil column, eluted with n-hexane; aqueous solutions extracted with n-hexane; Not applicable; 90% (first extraction, organism concentrations 100 - 25,000 ug/kg wet wt.)
Rate Constant and Results per Recovery	Not reported; Wet wt., lipid normalized; other
Statistics, Basis, and Calculation Basis	Not reported; Wet wt., lipid normalized; other
Results Value and Results Details	BCF=3000; 24 h concentration factors (exposure 65.6, 13.4, and 4.5 ug/L): 48.0 – 56.5, 95.2 – 42.8, 49.2 -37.348 h concentration factors (exposure 65.6, 13.4, and 4.5 ug/L): 40.1 - 48.4, 63.4 - 44.9, 49.2 – 48.024 h depuration % release (exposure 65.6, 13.4, and 4.5 ug/L): 100, 100, 100%
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 name.
	Metric 2: Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design	Metric 3: Study Controls	Medium	Concurrent negative controls were included, the results were not reported except for organism health.
	Metric 4: Test Substance Stability	High	Test substance preparation was reported and appropriate, concentrations were verified analytically and had low variability.
Domain 3: Test Conditions	Metric 5: Test Method Suitability	High	The test method was appropriate for the test substance.

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Study Citation:		Galassi, S., Calamari, D., Setti, F. (1982). Uptake and release of p-dichlorobenzene in early life stages of Salmo gairdneri. Ecotoxicology and Environmental Safety 6(5):439-447.		
OECD Harmonized Template:		Aquatic Bioconcentration		
HERO ID:		4908833		
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 6:	Testing Conditions	Medium	No tank conditions besides temperature were reported for the study.
	Metric 7:	Testing Consistency	Medium	Exposure concentrations and durations were consistent across study groups, other conditions were not reported and consistency cannot be verified.
	Metric 8:	System Type and Design	High	The flow through system was capable of maintaining test substance concentrations, which were verified analytically.
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 organism species, life stage and mass were reported and are used for similar study types.
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 methods were appropriate and conducted at an appropriate frequency to calculate rate constants.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability and uncertainty was not explicitly addressed.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	Mortality (< 30%) was comparable across all study groups and no abnormalities were observed during histological examination of embryos.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The analytical method was appropriate. Limits of detection and percent recovery were reported. Bioaccumulation was lipid normalized.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were described and conducted appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results are reasonable based on the method and in agreement with findings from other studies.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

* Related References: ECHA rating: 2

Study Citation:	Gobas, F. A. P.C, Clark, K. E., Shiu, W. Y., Mackay, D. (1989). Bioconcentration of polybrominated benzenes and biphenyls and related superhydrophobic chemicals in fish: Role of bioavailability and elimination into the feces. Environmental Toxicology and Chemistry 8(3):231-246.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	654540

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, and Guideline	None; Experimental; other: Non-guideline
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Foxboro Analabs; NR; $\geq 98\%$; confirmed by GC-ECD
Test Organism and Test Organism Details	Poecilia reticulata; laboratory-bred male guppies, average weight 0.098g
Lipid Content, Test Temperature, pH, and Depuration Time	average lipid content (g/g) 6.5%; $22 \pm 1^\circ\text{C}$; Not reported; 180 days (exp. 1); 198 days (exp. 2)
Media Type, TOC, and Salinity	natural water: freshwater; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Whole body exposure via environment; Fish were sampled on day 0.7, 1.7, 3.7, 4.7, 8.7, 15.7, 22.7, 68, 106 and 180 (exp. 1); 2, 6, 14, 30, 42, 66, 98, 124, 160 and 198 d (exp. 2); Measured
Test Type, Test Temperature, and Test Condition	flow-through; $22 \pm 1^\circ\text{C}$; Toronto tap water recirculated continuously at 50 L/d through a sedimentation tank with a generator column impregnated
Comments	with test chemicals to ensure saturation at time 0
Duration, Parameter, and Sampling Frequency	31 days (exp. 1); 12 days (exp. 2); other; Uptake: 1, 2, 3, 4, 6, 9, 11, and 12 days (exp. 1); 2, 5, 10, 12, 16, 20, 24, 26, 28, 30 and 31 days (exp. 2)
Concentration	Not Reported
Analytical Method and Analytical Details	GC-ECD; Gas chromatography with Ni electron capture detector;
Rate Constant and Results per Recovery	$\log k$ uptake = 1.99/day; $\log k$ total depuration = 0.00 ± 0.08 /day; Not reported
Statistics, Basis, and Calculation Basis	Not reported; total lipid content; other
Results Value and Results Details	3.25; 3.25; 3.64; $\log K$ values for Observed lipid weight based BCF; bioavailability-corrected BCF; correlated lipid weight-based BCF, respectively
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 definitively.
	Metric 2:	Test Substance Purity	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Low	The study did not include or report crucial 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:		Gobas, F. A. P., Clark, K. E., Shiu, W. Y., Mackay, D. (1989). Bioconcentration of polybrominated benzenes and biphenyls and related superhydrophobic chemicals in fish: Role of bioavailability and elimination into the feces. Environmental Toxicology and Chemistry 8(3):231-246.		
OECD Harmonized Template:		Aquatic Bioconcentration		
HERO ID:		654540		
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Low	Various testing conditions were not reported.
	Metric 7:	Testing Consistency	High	The test conditions were consistent.
	Metric 8:	System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.
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	This metric met the criteria for high confidence as expected for this type of study.
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	This metric met the criteria for high confidence as expected for this type of study.
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	Some details were omitted; however, the lack of data is not likely to hinder the interpretation of the results.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results were reasonable; however control groups were not included.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

Study Citation:	Gobas, F. A. P.,C, Lovett-Doust, L., Haffner, G. D. (1991). Comparative study of the bioconcentration and toxicity of chlorinated hydrocarbons in aquatic macrophytes and fish. 2:178-194.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	5237087

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, and Guideline	None; Experimental; other: Guideline not specified, flow-through bioconcentration study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: Test substance details may be reported elsewhere
Test Organism and Test Organism Details	Poecilia reticulata; Not reported
Lipid Content, Test Temperature, pH, and Depuration Time	0.2±0.02%; Not reported; Not reported; day 20 - 180
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	Water; Tank with clean water, continuously carbon filtered water; Measured
Test Type, Test Temperature, and Test Condition	flow-through; Not reported; Test method details may have been reported elsewhere
Comments	
Duration, Parameter, and Sampling Frequency	180 days; Not Reported; Shown graphically
Concentration	Not reported
Analytical Method and Analytical Details	Not reported; Method details may be reported elsewhere;
Rate Constant and Results per Recovery	98 L/L d (uptake); 1.0 /d (elimination); Not reported
Statistics, Basis, and Calculation Basis	NR, n=90 - 120; normalized lipid fraction; Not Reported
Results Value and Results Details	log Kl=3.18; log BCF=1.99; log value of lipid-weight-based bioconcentration factor (Kl)=3.18; log BCF=1.99
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 name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	Study controls were not explicitly reported, however the authors report the study method details were reported elsewhere and this other source may contain information on this parameter.
	Metric 4:	Test Substance Stability	Medium	Test substance delivery was reported, but no information on storage conditions or preparation was provided.

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Study Citation:	Gobas, F. A. P., C, Lovett-Doust, L., Haffner, G. D. (1991). Comparative study of the bioconcentration and toxicity of chlorinated hydrocarbons in aquatic macrophytes and fish. 2:178-194.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	5237087			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	N/A	Limited to no test conditions were reported, however the authors report the study method details were reported elsewhere and this other source may contain information on this parameter.
	Metric 7:	Testing Consistency	High	Test conditions appear to be consistent between replicates and study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established and the system was capable of maintaining substance concentrations.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to the study type.
	Metric 10:	Sampling Methods	Medium	The test organism species was reported, but no other organism details were provided. However, the authors report the study method details were reported elsewhere and this other source may contain information on this parameter.
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	High	The sampling methods were reported and appropriate for the study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Sources of variability and uncertainty were not explicitly accounted for in the study.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups and no differences in organism attrition or health were reported.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The lipid-normalized BCF was reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were described and appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable and followed known log Kow trends.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	Mcintyre, D. O. (1988). The effect of temperature on uptake rate constants, depuration rate constants, and bioconcentration factors (BCF) for six organochlorines in the aquatic insect, Chironomus riparius. Doctoral Dissertation:158.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	5258518

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; DiCB
Confidentiality, Type, and Guideline	None; Experimental; other: Non-guideline study
Solvent, Reactivity, Storage, Stability	Stock prepared in toluene; working solutions further diluted in acetone, which were used to prepare aqueous concentrations in 6L water; NR; Working and stock solutions stored at -20°C; NR
Radiolabel, Source, State, Purity	14C uniformly ring-labelled; specific activity 165 dpm/ng; Pathfinder Laboratories; NR; 98% Notes: Specific activity obtained by determining mass via gas-liquid chromatography and radioactivity by liquid scintillation counting.
Test Organism and Test Organism Details	Chironomus riparius Melgen; third and fourth instar larvae (5-15 mm length)
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 30°C; Not reported; 10 hours
Media Type, TOC, and Salinity	other; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Water; Organisms transferred to chamber continuously flushed with uncontaminated water; Not reported
Test Type, Test Temperature, and Test Condition	static; 30°C; Midge larvae were exposed to sublethal aqueous concentrations of the test substance in glass-stoppered bottles, placed in an incubator which were allowed to equilibrate overnight to temperature conditions.
Comments	
Duration, Parameter, and Sampling Frequency	5.25 hours; Not Reported; Not reported
Concentration	Not Reported
Analytical Method and Analytical Details	Liquid scintillation counting; Organisms transferred to polyethylene liquid scintillation dioxane cocktail for 2 days prior to analysis; Water samples transferred to liquid scintillation dioxane cocktail and analyzed;
Rate Constant and Results per Recovery	Uptake Ku: 169±47 mL/g h; 71 mL/g h (steady state); 80±6.2 mL/g h (representative, pairwise comparison) Elimination kd: 461±19 x 10 ⁻³ / h (exponential method); 2840±700 x 10 ⁻³ / h (nonlinear) Half-life: 1.5 h; Not reported
Statistics, Basis, and Calculation Basis	Pairwise t-tests, alpha=0.05, for ku, kd, and EC50 values across temperatures; ANOVA for kd and BCF values across temperature data; whole body w.w.; other
Results Value and Results Details	BCF=159 (steady state); 171 (kinetic); Steady state uptake observed at around 5 hours.
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 name.
	Metric 2:	Test Substance Purity	High The test substance source and purity were reported.
Domain 2: Test Design			
	Metric 3:	Study Controls	Medium Controls were not explicitly reported in the study.

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Study Citation:	Mcintyre, D. O. (1988). The effect of temperature on uptake rate constants, depuration rate constants, and bioconcentration factors (BCF) for six organochlorines in the aquatic insect, Chironomus riparius. Doctoral Dissertation:158.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	5258518			
Domain	Metric	EVALUATION		Comments
	Metric 4:	Test Substance Stability	High	The test substance preparation and storage conditions were reported and appropriate for the chemical substance.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Limited test conditions were reported, test exposure concentrations were not reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across replicates and study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established and the system was capable of maintaining substance concentrations.
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	Test organism species and age were reported and are routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining bioaccumulation.
	Metric 12:	Test Substance Purity	High	Sampling was conducted at an appropriate frequency and used accepted methods.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability between measurements and study groups was addressed.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, exposed concentrations were determined to be sub-lethal in preliminary experiments, and no differences in organism attrition were reported.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Lipid content or lipid-normalized BCF were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods and kinetic calculations were well described and suitable for the method.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable based on the method, however lipid normalized values could not be determined and limited test conditions were reported.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	Mcintyre, D. O. (1988). The effect of temperature on uptake rate constants, depuration rate constants, and bioconcentration factors (BCF) for six organochlorines in the aquatic insect, Chironomus riparius. Doctoral Dissertation:158.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	5258518

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; DiCB
Confidentiality, Type, and Guideline	None; Experimental; other: Non-guideline study
Solvent, Reactivity, Storage, Stability	Stock prepared in toluene; working solutions further diluted in acetone, which were used to prepare aqueous concentrations in 6L water; NR; Working and stock solutions stored at -20°C; NR
Radiolabel, Source, State, Purity	¹⁴ C uniformly ring-labelled; specific activity 165 dpm/ng; Pathfinder Laboratories; NR; 98% Notes: Specific activity obtained by determining mass via gas-liquid chromatography and radioactivity by liquid scintillation counting.
Test Organism and Test Organism Details	Chironomus riparius Melgen; third and fourth instar larvae (5-15 mm length)
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 10°C; Not reported; 25 hours
Media Type, TOC, and Salinity	other; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Water; Organisms transferred to chamber continuously flushed with uncontaminated water; Not reported
Test Type, Test Temperature, and Test Condition	static; 10°C; Midge larvae were exposed to sublethal aqueous concentrations of the test substance in glass-stoppered bottles, placed in an incubator which were allowed to equilibrate overnight to temperature conditions.
Comments	16.25 hours; Not Reported; Not reported
Duration, Parameter, and Sampling Frequency	Not Reported
Analytical Method and Analytical Details	Liquid scintillation counting; Organisms transferred to polyethylene liquid scintillation dioxane cocktail for 2 days prior to analysis; Water samples transferred to liquid scintillation dioxane cocktail and analyzed;
Rate Constant and Results per Recovery	Uptake Ku: 57±11 mL/g h; 19 mL/g h (steady state); 35±5.5 mL/g h (representative, pairwise comparison) Elimination kd: 73±4 x 10 ⁻³ / h (exponential method); 237±67 x 10 ⁻³ / h (nonlinear) Half-life: 10 h; Not reported
Statistics, Basis, and Calculation Basis	Pairwise t-tests, alpha=0.05, for ku, kd, and EC50 values across temperatures; ANOVA for kd and BCF values across temperature data; whole body w.w.; other
Results Value and Results Details	BCF=270 (steady state); 479 (kinetic); Steady state uptake observed at around 5 hours.
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 name.
	Metric 2:	Test Substance Purity	High The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium Controls were not explicitly reported in the study.
	Metric 4:	Test Substance Stability	High The test substance preparation and storage conditions were reported and appropriate for the chemical substance.

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Study Citation:	Mcintyre, D. O. (1988). The effect of temperature on uptake rate constants, depuration rate constants, and bioconcentration factors (BCF) for six organochlorines in the aquatic insect, Chironomus riparius. Doctoral Dissertation:158.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	5258518			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Limited test conditions were reported, test exposure concentrations were not reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across replicates and study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established and the system was capable of maintaining substance concentrations.
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	Test organism species and age were reported and are routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining bioaccumulation.
	Metric 12:	Test Substance Purity	High	Sampling was conducted at an appropriate frequency and used accepted methods.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability between measurements and study groups was addressed.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, exposed concentrations were determined to be sub-lethal in preliminary experiments, and no differences in organism attrition were reported.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Lipid content or lipid-normalized BCF were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods and kinetic calculations were well described and suitable for the method.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable based on the method, however lipid normalized values could not be determined and limited test conditions were reported.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

Study Citation:	Mcintyre, D. O. (1988). The effect of temperature on uptake rate constants, depuration rate constants, and bioconcentration factors (BCF) for six organochlorines in the aquatic insect, Chironomus riparius. Doctoral Dissertation:158.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	5258518

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; DiCB
Confidentiality, Type, and Guideline	None; Experimental; other: Non-guideline study
Solvent, Reactivity, Storage, Stability	Stock prepared in toluene; working solutions further diluted in acetone, which were used to prepare aqueous concentrations in 6L water; NR; Working and stock solutions stored at -20°C; NR
Radiolabel, Source, State, Purity	14C uniformly ring-labelled; specific activity 165 dpm/ng; Pathfinder Laboratories; NR; 98% Notes: Specific activity obtained by determining mass via gas-liquid chromatography and radioactivity by liquid scintillation counting.
Test Organism and Test Organism Details	Chironomus riparius Melgen; third and fourth instar larvae (5-15 mm length)
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 22°C; Not reported; 8.25 hours
Media Type, TOC, and Salinity	other; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Water; Organisms transferred to chamber continuously flushed with uncontaminated water; Not reported
Test Type, Test Temperature, and Test Condition	static; 22°C; Midge larvae were exposed to sublethal aqueous concentrations of the test substance in glass-stoppered bottles, placed in an incubator which were allowed to equilibrate overnight to temperature conditions.
Comments	9 hours; Not Reported; Not reported
Duration, Parameter, and Sampling Frequency	Not Reported
Concentration	Liquid scintillation counting; Organisms transferred to polyethylene liquid scintillation dioxane cocktail for 2 days prior to analysis; Water samples transferred to liquid scintillation dioxane cocktail and analyzed;
Analytical Method and Analytical Details	Uptake Ku: 127±48 mL/g h; 56 mL/g h (steady state); 65±6.4 mL/g h (representative, pairwise comparison) Elimination kd: 318±34 x 10 ⁻³ / h (exponential method); 1520±770 x 10 ⁻³ / h (nonlinear) Half-life: 2 h; Not reported
Rate Constant and Results per Recovery	Pairwise t-tests, alpha=0.05, for ku, kd, and EC50 values across temperatures; ANOVA for kd and BCF values across temperature data; whole body w.w.; other
Statistics, Basis, and Calculation Basis	BCF=185 (steady state); 204 (kinetic); Steady state uptake observed at around 5 hours.
Results Value and Results Details	Not reported; Not reported; Not reported
Metabolites, Reference, and Results Reference Substance	

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 purity were reported.
Domain 2: Test Design	Metric 3: Study Controls	Medium	Controls were not explicitly reported in the study.
	Metric 4: Test Substance Stability	High	The test substance preparation and storage conditions were reported and appropriate for the chemical substance.

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Study Citation:	Mcintyre, D. O. (1988). The effect of temperature on uptake rate constants, depuration rate constants, and bioconcentration factors (BCF) for six organochlorines in the aquatic insect, Chironomus riparius. Doctoral Dissertation:158.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	5258518			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Limited test conditions were reported, test exposure concentrations were not reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across replicates and study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established and the system was capable of maintaining substance concentrations.
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	Test organism species and age were reported and are routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining bioaccumulation.
	Metric 12:	Test Substance Purity	High	Sampling was conducted at an appropriate frequency and used accepted methods.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability between measurements and study groups was addressed.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, exposed concentrations were determined to be sub-lethal in preliminary experiments, and no differences in organism attrition were reported.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Lipid content or lipid-normalized BCF were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods and kinetic calculations were well described and suitable for the method.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable based on the method, however lipid normalized values could not be determined and limited test conditions were reported.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

Study Citation:	Mcintyre, D. O. (1988). The effect of temperature on uptake rate constants, depuration rate constants, and bioconcentration factors (BCF) for six organochlorines in the aquatic insect, Chironomus riparius. Doctoral Dissertation:158.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	5258518

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; DiCB
Confidentiality, Type, and Guideline	None; Experimental; other: Non-guideline study
Solvent, Reactivity, Storage, Stability	Stock prepared in toluene; working solutions further diluted in acetone, which were used to prepare aqueous concentrations in 6L water; NR; Working and stock solutions stored at -20°C; NR
Radiolabel, Source, State, Purity	14C uniformly ring-labelled; specific activity 165 dpm/ng; Pathfinder Laboratories; NR; 98% Notes: Specific activity obtained by determining mass via gas-liquid chromatography and radioactivity by liquid scintillation counting.
Test Organism and Test Organism Details	Chironomus riparius Melgen; third and fourth instar larvae (5-15 mm length)
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 16°C; Not reported; 24 hours
Media Type, TOC, and Salinity	other; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Water; Organisms transferred to chamber continuously flushed with uncontaminated water; Not reported
Test Type, Test Temperature, and Test Condition	static; 16°C; Midge larvae were exposed to sublethal aqueous concentrations of the test substance in glass-stoppered bottles, placed in an incubator which were allowed to equilibrate overnight to temperature conditions.
Comments	9.25 hours; Not Reported; Not reported
Duration, Parameter, and Sampling Frequency	Not Reported
Analytical Method and Analytical Details	Liquid scintillation counting; Organisms transferred to polyethylene liquid scintillation dioxane cocktail for 2 days prior to analysis; Water samples transferred to liquid scintillation dioxane cocktail and analyzed;
Rate Constant and Results per Recovery	Uptake Ku: 119±33 mL/g h; 27 mL/g h (steady state); 48±3.9 mL/g h (representative, pairwise comparison) Elimination kd: 111±14 x 10 ⁻³ / h (exponential method); 743±97 x 10 ⁻³ / h (nonlinear) Half-life: 6 h; Not reported
Statistics, Basis, and Calculation Basis	Pairwise t-tests, alpha=0.05, for ku, kd, and EC50 values across temperatures; ANOVA for kd and BCF values across temperature data; whole body w.w.; other
Results Value and Results Details	BCF=242 (steady state); 432 (kinetic); Steady state uptake observed at around 5 hours.
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
	Metric 2:	Test Substance Purity	High
Domain 2: Test Design	Metric 3:	Study Controls	Medium
	Metric 4:	Test Substance Stability	High

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Study Citation:	Mcintyre, D. O. (1988). The effect of temperature on uptake rate constants, depuration rate constants, and bioconcentration factors (BCF) for six organochlorines in the aquatic insect, Chironomus riparius. Doctoral Dissertation:158.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	5258518			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Limited test conditions were reported, test exposure concentrations were not reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across replicates and study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established and the system was capable of maintaining substance concentrations.
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	Test organism species and age were reported and are routinely used for similar study types.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining bioaccumulation.
	Metric 12:	Test Substance Purity	High	Sampling was conducted at an appropriate frequency and used accepted methods.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability between measurements and study groups was addressed.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	There were multiple study groups, exposed concentrations were determined to be sub-lethal in preliminary experiments, and no differences in organism attrition were reported.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Lipid content or lipid-normalized BCF were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods and kinetic calculations were well described and suitable for the method.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable based on the method, however lipid normalized values could not be determined and limited test conditions were reported.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	Mortimer, M. R., Connell, D. W. (1993). Bioconcentration factors and kinetics of chlorobenzenes in a Juvenile Crab (<i>Portunus pelagicus</i> (L)). Australian Journal of Marine and Freshwater Research 44(4):565-576.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	660309

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, and Guideline	None; Experimental; other: Uptake and depuration-rate constants determined in marine crab using timed exposures and biotic tissue concentrations
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Aldrich Chemical Company; NR; at least 98% pure
Test Organism and Test Organism Details	<i>Portunus pelagicus</i> ; Juvenile marine crabs maintained at 26°C in sea water adjusted to 25 g/L salinity; mean carapace width=11.6 mm
Lipid Content, Test Temperature, pH, and Depuration Time	Mean lipid content 0.39% of weight; 26°C; Not reported; 24 hours
Media Type, TOC, and Salinity	natural water: marine; Not reported; 25 g/L
Dissolved Oxygen, Conductivity, and Hardness	Aerated for 24h before use; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Environment; Not reported; Measured
Test Type, Test Temperature, and Test Condition Comments	static; 26°C; Batches of crabs exposed to known concentrations of each analyte in a mixture of 1,4-Dichlorobenzene and 1, 2, 3-trichlorobenzene
Duration, Parameter, and Sampling Frequency	48 hours; other; Exposure: 4, 8, 16, 24hours; depuration: 24, 28, 32, 40, 48hours
Concentration	250 - 500 µg/L
Analytical Method and Analytical Details	GC-[63Ni] ECD with Florisil column; Tracor Model 560 GC with linearizer, HP 3390A integrator with on-column injector and [63Ni] ECD.;
Rate Constant and Results per Recovery	Uptake k1=720/hr; depuration k2=0.492/h; 71.5%; relative recovery was within 5% and appropriate corrections were made to measured values.
Statistics, Basis, and Calculation Basis	All standard plots were linear with correlation coefficient of ≥99%; normalized lipid fraction; kinetic
Results Value and Results Details	3.16 (log Kbl); Bioconcentration factor in lipid weight terms
Metabolites, Reference, and Results Reference Substance	Not reported; Tissue blanks included; No detection of target chemical

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	Test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, and 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:	Mortimer, M. R., Connell, D. W. (1993). Bioconcentration factors and kinetics of chlorobenzenes in a Juvenile Crab (Portunus pelagicus (L)). Australian Journal of Marine and Freshwater Research 44(4):565-576.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	660309			
Domain		Metric	EVALUATION	
			Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Some testing details, such as water pH, were missing; 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	This metric met the criteria for high confidence as expected for this type of study.
	Metric 8:	System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	Medium	The test organism, species, or inoculum source were reported, but are not routinely used for similar study types; however, the deviation was not likely to have a substantial impact on study results.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 12:	Test Substance Purity	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 14:	Health Outcomes Unrelated to Exposure	Medium	Attrition or health outcomes were not reported; however, this omission was not likely to have a substantial impact on study results.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.
	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:	Neely, W. B., Branson, D. R., Blau, G. E. (1974). Partition coefficient to measure bioconcentration potential of organic chemicals in fish. Environmental Science & Technology 8(13):1113-1115.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	18737

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-Dichlorobenzene
Confidentiality, Type, and Guideline	None; Experimental; other: Method described by Branson et al 1974 for determination of BCF in Rainbow trout
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; >99% by GC
Test Organism and Test Organism Details	Salmo gairdneri, rainbow trout; 4-5 in. length, 8-10 gr. Weight; regular feeding
Lipid Content, Test Temperature, pH, and Depuration Time	NR (Tissue: trout muscle); Constant temp; 8; Not reported
Media Type, TOC, and Salinity	natural water: freshwater; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Environment/water; Fish placed in fresh water during clearance phase; Measured
Test Type, Test Temperature, and Test Condition	static; Constant temp; 16 hr. light/day; Dechlorinated Lake Huron water (chemical composition in Table 1)
Comments	
Duration, Parameter, and Sampling Frequency	Not reported; other: Various time periods
Concentration	Two concentrations an order of magnitude apart - Not reported
Analytical Method and Analytical Details	Not reported; Water and fish samples analyzed;
Rate Constant and Results per Recovery	k1=uptake rate 5.670±0.425 hr-1; k2=clearance rate 0.0264±0.00157 hr-1; Not reported
Statistics, Basis, and Calculation Basis	95% confidence interval (Bayesian estimation procedure); Relation to log Kow; multiple correlation coefficient (0.948) and F test (confidence level 0.999); other: fish muscle; steady state
Results Value and Results Details	215±21; Bioconcentration (k1/k2); Supports relation to log kow; log BCF = 0.542*log Kow + 0.124
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 chemical name.
	Metric 2:	Test Substance Purity	High	The purity of the test substance was confirmed by analytical methods.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Study controls were not included but this did not limit the interpretation of the results.
	Metric 4:	Test Substance Stability	Medium	Details regarding this metric were not reported but this did not limit the interpretation of the results.
Domain 3: Test Conditions				

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Study Citation:	Neely, W. B., Branson, D. R., Blau, G. E. (1974). Partition coefficient to measure bioconcentration potential of organic chemicals in fish. Environmental Science & Technology 8(13):1113-1115.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	18737			
Domain	Metric	EVALUATION		Comments
	Metric 5:	Test Method Suitability	Medium	Test method was described elsewhere; additional investigation would need to be performed to accurately rate this metric.
	Metric 6:	Testing Conditions	Medium	Information regarding this metric was limited; the method was described elsewhere; omissions were not likely to have had an impact on the study results. Concentration of test material not reported, may be in the test method source.
	Metric 7:	Testing Consistency	High	Duplicate/consistent tests were run for two concentrations.
	Metric 8:	System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.
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	Information was reported; routine test organism was used.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome of interest and its basis were reported; the final BCF was calculated from two separate experiments at two different exposure concentrations that were not reported. Results were interpretable.
	Metric 12:	Test Substance Purity	Medium	Details regarding this metric were limited but not likely to have had a substantial impact on the results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	95% confidence intervals were calculated and reported in text and in graph. Authors discussed general reliability of results.
	Metric 14:	Health Outcomes Unrelated to Exposure	Medium	Attrition and health outcomes were not reported, but is not likely to impact the results.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Lipid normalized BCF was not reported; concentration-specific endpoint data were not included; precise interpretation of the results may be limited.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Average of two different exposure levels were reported. Some details were omitted; however, these omissions were not likely to have had a substantial impact on the study results.
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 experimental data in this paper was used to create a linear regression between log Kow and log BCF for use in estimating BCF.

Overall Quality Determination**Medium**

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Study Citation:	Neely, W. B., Branson, D. R., Blau, G. E. (1974). Partition coefficient to measure bioconcentration potential of organic chemicals in fish. Environmental Science & Technology 8(13):1113-1115.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	18737

		EVALUATION	
Domain	Metric	Rating	Comments

* Related References: ECHA rating: 2

Study Citation:	Oliver, B. G., Niimi, A. J. (1985). Bioconcentration factors of some halogenated organics for rainbow trout: limitations in their use for prediction of environmental residues. Environmental Science & Technology 19(9):842-849.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	1443873

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, and Guideline	None; Experimental; other: bioconcentration in rainbow trout
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: 1,4-DCB
Test Organism and Test Organism Details	Rainbow trout (<i>Salmo gairdneri</i>); 32 fish; weight range 202±35 to 312±49 g
Lipid Content, Test Temperature, pH, and Depuration Time	lipid content ranged from 6.3±2.5 to 7.7±2.2%; Not reported; Not reported; Not reported
Media Type, TOC, and Salinity	other; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	water; Not reported; Measured
Test Type, Test Temperature, and Test Condition Comments	not specified; Not reported; Mean water concentration=81±22 ng/L (tank 1; range 57-110), 73±20 ng/L (tank 2; range 44-95)
Duration, Parameter, and Sampling Frequency	96 days; BCF [chemical concentration in fish (ng/kg wet weight)/chemical concentration in water (ng/L)]; 6 fish sampled after 7, 21, 35, 50, 75, and 96 days
Concentration	44 - 110 ng/L
Analytical Method and Analytical Details	GC/ECD; Samples were quantified on dual capillary columns with electron capture detection;
Rate Constant and Results per Recovery	Not reported; ≥ 80%
Statistics, Basis, and Calculation Basis	reproducibility of the methods on replicate samples was ±10%; Not Reported; Not Reported
Results Value and Results Details	Tank 1: BCF (x 10-3)=0.51±0.15 (day 7); 0.39±0.07 (day 21); 1.0±0.21 (day 35); 0.53±0.18 (day 50); 0.22±0.06 (day 75); 0.43±0.14 (day 96); 0.51±0.26 (average); Tank 2: BCF (x 10-3)=0.82±0.24 (day 7); 0.86±0.17 (day 21); 1.4±0.29 (day 35); 1.1±0.27 (day 50); 0.59±0.10 (day 75); 0.55±0.10 (day 96); 0.89±0.32 (average)
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 name.
	Metric 2:	Test Substance Purity	Low	The source and purity were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	Control tanks 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.

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Study Citation:	Oliver, B. G., Niimi, A. J. (1985). Bioconcentration factors of some halogenated organics for rainbow trout: limitations in their use for prediction of environmental residues. Environmental Science & Technology 19(9):842-849.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	1443873			
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.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	Medium	Equilibrium was directly reported but this was not likely to have a substantial impact on study results.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this type of study.
	Metric 10:	Sampling Methods	High	Standard test organism used; body weight was reported.
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(s) of interest.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	No confounding variables were noted.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this type of study.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Analytical details were omitted.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	No statistical analyses were not described.
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			High	

Study Citation:	Oliver, B. G., Niimi, A. J. (1983). Bioconcentration of chlorobenzenes from water by rainbow trout: correlations with partition coefficients and environmental residues. Environmental Science & Technology 17(5):287-291.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	4159607

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported; Bioaccumulation in fish
Solvent, Reactivity, Storage, Stability	Methanol; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Aldrich Chemical Co.; NR; NR
Test Organism and Test Organism Details	Rainbow trout; n=32, average initial weight 250 g
Lipid Content, Test Temperature, pH, and Depuration Time	8.1±1.7% (8d), 8.4±0.8% (39d), 8.7±2.5% (69d), 8.3±3.3% (99d), 8.2±1.9% (119 d); 15±1°C; Not reported; Not applicable
Media Type, TOC, and Salinity	other; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Water; Not applicable; Measured low exposure: 28 ±5 ng/L
Test Type, Test Temperature, and Test Condition	flow-through; 15±1°C; Test substance mixture of chlorobenzenes pumped continuously at 1 mL/min; solutions replaced every 2 days; BCFs control corrected.
Comments	
Duration, Parameter, and Sampling Frequency	119 days; Not Reported; 10, 34, 63, 119 days (control), 8, 39, 69, 99, and 119 days (low exposure)
Concentration	28 ng/L
Analytical Method and Analytical Details	Capillary gas chromatography and electron capture detectors; Digestive tract removed and whole fish homogenized, ground with Na ₂ SO ₄ , Soxhlet extracted with acetone/hexane, condensed, cleaned up on Florisil column; water extracted with pentane, concentrated, and cleaned up with Na ₂ SO ₄ /Florisil column;
Rate Constant and Results per Recovery	Not applicable; 80 - 92% (range reported for studied chlorobenzenes)
Statistics, Basis, and Calculation Basis	log BCF=-0.869 + (0.997±0.056)log K (r ² =0.986); Whole body, wet wt.; steady state
Results Value and Results Details	BCF=370±73; Fish concentrations (ng/g): 12±2.0 / 8d, 14±3.0 / 39d, 11±4.8 / 69d, 7.9±1.9 / 99d, 9.9±3.0 / 119d; BCF=340, 490, 390, 300, and 360, respectively
Metabolites, Reference, and Results Reference Substance	Not reported; Controls exposed to distilled water in methanol (4±2 ng/L test substance); ND - 2.8±1.0 ng/g fish

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 was reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	Controls were included and the results were reported; study results were control-corrected.
	Metric 4:	Test Substance Stability	High	The test substance preparation was reported and test system concentrations were verified weekly.

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Study Citation:	Oliver, B. G., Niimi, A. J. (1983). Bioconcentration of chlorobenzenes from water by rainbow trout: correlations with partition coefficients and environmental residues. Environmental Science & Technology 17(5):287-291.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	4159607			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Many testing conditions were omitted.
	Metric 7:	Testing Consistency	High	Test system set up was consistent across samples and study groups.
	Metric 8:	System Type and Design	High	The flow through system was capable of achieving equilibrium and maintaining test substance concentrations.
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 organism species, source, and initial weight were reported.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining bioconcentration.
	Metric 12:	Test Substance Purity	High	Sampling was conducted at an appropriate frequency and used widely accepted approaches.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	The test substance was a mixture of chlorobenzenes, effects this may have on bioaccumulation compared to the pure substance cannot be determined.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	No significant changes in organism health or attrition compared to controls were observed.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The analytical method was appropriate, recovery was reported but the limits of detection were not. Lipid content was reported and lipid normalized BCFs can be determined by multiplying the BCF by 12 since the mean lipid content of the fish was 8.5%.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Relationship to log Kow was described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable based on the method, comparable to previously published values, and supported known relationships to log Kow.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination**High**

* Related References: HSDB

Study Citation:	Oliver, B. G., Niimi, A. J. (1983). Bioconcentration of chlorobenzenes from water by rainbow trout: correlations with partition coefficients and environmental residues. Environmental Science & Technology 17(5):287-291.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	4159607

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, and Guideline	None; Experimental; other: Not reported; Bioaccumulation in fish
Solvent, Reactivity, Storage, Stability	Methanol; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Aldrich Chemical Co.; NR; NR
Test Organism and Test Organism Details	Rainbow trout; n=32, average initial weight 250 g
Lipid Content, Test Temperature, pH, and Depuration Time	7.2±1.5% (7d), 8.0±1.3% (22d), 9.4±2.9% (43d), 10.7±1.3% (63d), 8.7±1.2% (105d); 15±1°C; Not reported; Not applicable
Media Type, TOC, and Salinity	other; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Water; Not applicable; Measured low exposure: 670 ±180 ng/L
Test Type, Test Temperature, and Test Condition	flow-through; 15±1°C; Test substance mixture of chlorobenzenes pumped continuously at 1 mL/min; solutions replaced every 2 days; BCFs control corrected.
Comments	
Duration, Parameter, and Sampling Frequency	105 days; Not Reported; 10, 34, 63, 119 days (control), 7, 22, 43, 63, and 105 days (high exposure)
Concentration	670 ng/L
Analytical Method and Analytical Details	Capillary gas chromatography and electron capture detectors; Digestive tract removed and whole fish homogenized, ground with Na ₂ SO ₄ , Soxhlet extracted with acetone/hexane, condensed, cleaned up on Florisil column; water extracted with pentane, concentrated, and cleaned up with Na ₂ SO ₄ /Florisil column;
Rate Constant and Results per Recovery	Not applicable; 80 - 92% (range reported for studied chlorobenzenes)
Statistics, Basis, and Calculation Basis	log BCF=-0.632 + (1.022±0.057)log K (r ² =0.986); Whole body, wet wt.; steady state
Results Value and Results Details	BCF=720±130; Fish concentrations (ng/g): 340±56 / 7d, 300±56 / 22d, 540±170 / 43d, 390±91 / 63d, 540±97 / 105d; BCF=680, 610, 910, 620, and 800, respectively
Metabolites, Reference, and Results Reference Substance	Not reported; Controls exposed to distilled water in methanol (4±2 ng/L test substance); ND - 2.8±1.0 ng/g fish

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 was reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	Controls were included and the results were reported; study results were control-corrected.
	Metric 4:	Test Substance Stability	High	The test substance preparation was reported and test system concentrations were verified weekly.
Domain 3: Test Conditions				

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Study Citation:	Oliver, B. G., Niimi, A. J. (1983). Bioconcentration of chlorobenzenes from water by rainbow trout: correlations with partition coefficients and environmental residues. Environmental Science & Technology 17(5):287-291.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	4159607			
Domain		Metric	EVALUATION	
			Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Many testing conditions were omitted.
	Metric 7:	Testing Consistency	High	Test system set up was consistent across samples and study groups.
	Metric 8:	System Type and Design	High	The flow through system was capable of achieving equilibrium and maintaining test substance concentrations.
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 species, source, and initial weight were reported.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology was appropriate for determining bioconcentration.
	Metric 12:	Test Substance Purity	High	Sampling was conducted at an appropriate frequency and used widely accepted approaches.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	The test substance was a mixture of chlorobenzenes, effects this may have on bioaccumulation compared to the pure substance cannot be determined.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	No significant changes in organism health or attrition compared to controls were observed.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The analytical method was appropriate, recovery was reported but the limits of detection were not. Lipid content was reported and lipid normalized BCFs can be determined by multiplying the BCF by 12 since the mean lipid content of the fish was 8.5%.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Relationship to log Kow was described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable based on the method, comparable to previously published values, and supported known relationships to log Kow.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

* Related References: HSDB

Study Citation:	Prasad, S. S. (1992). Predicting the environmental distribution of compounds with unknown physicochemical properties from known pesticide properties. Journal of AOAC International 75(5):916-924.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	660424

Parameter		EXTRACTION		
CASRN and Test Material		Not Reported; 1,4-Dichlorobenzene		
Confidentiality, Type, and Guideline		none; not specified; other: not specified		
Solvent, Reactivity, Storage, Stability		NR; NR; NR; NR		
Radiolabel, Source, State, Purity		NR; NR; NR; NR		
Test Organism and Test Organism Details		trout; 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		static; not reported; not reported		
Comments				
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 = 760; note in source: data derived from references cited (4 sources indicated)		
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.
	Metric 2:	Test Substance Purity	Medium	The test substance source was not reported in this secondary source.
Domain 2: Test Design	Metric 3:	Study Controls	Low	Controls were not reported in this secondary source.
	Metric 4:	Test Substance Stability	Medium	Details were not reported in this secondary source.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	Low	Details were not reported in this secondary source.
	Metric 6:	Testing Conditions	Low	Details were not reported in this secondary source.

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Study Citation:	Prasad, S. S. (1992). Predicting the environmental distribution of compounds with unknown physicochemical properties from known pesticide properties. Journal of AOAC International 75(5):916-924.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	660424			
Domain		Metric	EVALUATION	
			Rating	Comments
	Metric 7:	Testing Consistency	Low	Details were not reported in this secondary source.
	Metric 8:	System Type and Design	Medium	Details were not reported in this secondary source.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to the study.
	Metric 10:	Sampling Methods	Low	Details were not reported in this secondary source.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Low	Details were not reported in this secondary source.
	Metric 12:	Test Substance Purity	Low	Details were not reported in this secondary source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Details were not reported in this secondary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	Low	Details were not reported in this secondary source.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Details were not reported in this secondary source; value is reported to be derived from the sources cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	Low	Details were not reported in this secondary source.
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	A QSAR model was not reported.
Overall Quality Determination			Low	

* Related References: Four sources cited to value: (data not in distiller)HERO ID: 8112Handbook of environmental data on organic chemicalsAuthor: Verschueren, K (1983) (2nd ed). New York, NY: Van Nostrand Reinhold Company. HERO ID: 7417Relationship between water solubility, soil sorption, octanol-water partitioning, and concentration of chemicals in biotaAuthors: Kenaga, EE; Goring, CAI (1980) American Society for Testing and Materials 78-115HERO ID: 3828850Correlation of bioconcentration factors of chemicals in aquatic and terrestrial organisms with their physical and chemical propertiesAuthor: Kenaga, EE (1980) Environmental Science and Technology 14:553-556. HERO ID: 18737Partition coefficient to measure bioconcentration potential of organic chemicals in fishAuthors: Neely, WB; Branson, DR; Blau, GE (1974) Environmental Science and Technology 8:1113-1115.

Study Citation:	Prasad, S. S. (1992). Predicting the environmental distribution of compounds with unknown physicochemical properties from known pesticide properties. Journal of AOAC International 75(5):916-924.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	660424			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	Not Reported; 1,4-Dichlorobenzene			
Confidentiality, Type, and Guideline	none; not specified; other: not specified			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR			
Test Organism and Test Organism Details	fish; 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	flow-through; not reported; not reported			
Comments				
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 = 91; note in source: data derived from references cited (4 sources indicated)			
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.
	Metric 2:	Test Substance Purity	Medium	The test substance source was not reported in this secondary source.
Domain 2: Test Design				
	Metric 3:	Study Controls	Low	Controls were not reported in this secondary source.
	Metric 4:	Test Substance Stability	Medium	Details were not reported in this secondary source.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Low	Details were not reported in this secondary source.
	Metric 6:	Testing Conditions	Low	Details were not reported in this secondary source.
	Metric 7:	Testing Consistency	Low	Details were not reported in this secondary source.
	Metric 8:	System Type and Design	Medium	Details were not reported in this secondary source.
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Study Citation:	Prasad, S. S. (1992). Predicting the environmental distribution of compounds with unknown physicochemical properties from known pesticide properties. Journal of AOAC International 75(5):916-924.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	660424			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to the study.
	Metric 10:	Sampling Methods	Low	Details were not reported in this secondary source.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Low	Details were not reported in this secondary source.
	Metric 12:	Test Substance Purity	Low	Details were not reported in this secondary source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Details were not reported in this secondary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	Low	Details were not reported in this secondary source.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Details were not reported in this secondary source; value is reported to be derived from the sources cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	Low	Details were not reported in this secondary source.
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	A QSAR model was not reported.

Overall Quality Determination**Low**

* Related References: Four sources cited to value: (data not in distiller)HERO ID: 8112Handbook of environmental data on organic chemicalsAuthor: Verschueren, K (1983) (2nd ed). New York, NY: Van Nostrand Reinhold Company. HERO ID: 7417Relationship between water solubility, soil sorption, octanol-water partitioning, and concentration of chemicals in biotaAuthors: Kenaga, EE; Goring, CAI (1980) American Society for Testing and Materials 78-115HERO ID: 3828850Correlation of bioconcentration factors of chemicals in aquatic and terrestrial organisms with their physical and chemical propertiesAuthor: Kenaga, EE (1980) Environmental Science and Technology 14:553-556. HERO ID: 18737Partition coefficient to measure bioconcentration potential of organic chemicals in fishAuthors: Neely, WB; Branson, DR; Blau, GE (1974) Environmental Science and Technology 8:1113-1115.

Study Citation:	Smith, A. D., Bharath, A., Mallard, C., Orr, D., Mccarty, L. S., Ozburn, G. W. (1990). Bioconcentration kinetics of some chlorinated benzenes and chlorinated phenols in American flagfish, <i>Jordanella floridae</i> (Goode and Bean). Chemosphere 20(3-4):379-386.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	660540

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, and Guideline	None; Experimental; other: Proposed Standard Practice for Measuring Bioconcentration of Chemicals in Fish (ASTM 1978)
Solvent, Reactivity, Storage, Stability	Acetone; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Test Organism and Test Organism Details	juvenile American flagfish (<i>Jordanella floridae</i>); 4-6 months old males
Lipid Content, Test Temperature, pH, and Depuration Time	7-16% depending on size of fish, with 8-13% typical; 25±2°C; Not reported; 14 days
Media Type, TOC, and Salinity	natural water: freshwater; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	Solution in acetone introduced into tank systems and controls; Sampling during depuration 0.5, 1, 2, 3, 4, 5, 7, 10, 14 days; Nominal
Test Type, Test Temperature, and Test Condition	flow-through; 25±2°C; Photoperiod: 16hrs of wide spectrum lighting, 15 min of simulated dawn/dusk; fish fed and tanks siphoned daily
Comments	
Duration, Parameter, and Sampling Frequency	28 days; DT50; 1, 3, 7, 14, 21, 28 days
Concentration	5 µg/L
Analytical Method and Analytical Details	Not reported; Analytical details not reported. Data collected on water and tissue chemical concentration were evaluated by a computer program fitting the data to a non-linear curve designed to assess bioconcentration kinetics.;
Rate Constant and Results per Recovery	Whole fish based Uptake rate constant: 291±26/day; Fish Lipid based: Uptake rate constant: 4230±493/day; Not reported
Statistics, Basis, and Calculation Basis	Not reported; other; steady state
Results Value and Results Details	Half-life < 1 day; BCF=296±29 (whole fish); 3590±498 (fish lipid); Whole fish based; clearance rate constant: 0.98±0.04; time (1/2) for clearance: 0.70±0.03 days; Fish Lipid based: clearance rate constant: 1.18±0.11; time (1/2) for clearance: 0.59±0.05 days
Metabolites, Reference, and Results Reference Substance	Not reported; Control tank included; 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	Low	The test substance source and purity were not reported.
Domain 2: Test Design	Metric 3: Study Controls	Medium	Control tanks were included in the study; however, results from the controls were not included. The lack of data was not likely to have a substantial impact on the interpretation of the study results.

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Study Citation:	Smith, A. D., Bharath, A., Mallard, C., Orr, D., Mccarty, L. S., Ozburn, G. W. (1990). Bioconcentration kinetics of some chlorinated benzenes and chlorinated phenols in American flagfish, <i>Jordanella floridae</i> (Goode and Bean). Chemosphere 20(3-4):379-386.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	660540			
		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, such as the water pH; however, sufficient data were reported to determine that the omissions were not likely to have had a substantial impact on the study results.
	Metric 7:	Testing Consistency	High	The test conditions were consistent.
	Metric 8:	System Type and Design	High	The system type was appropriate.
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 organism information was reported and appropriate for the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	There was incomplete reporting of outcome assessment method; the analytical method was not reported.
	Metric 12:	Test Substance Purity	High	The study reported sampling methods that address the outcome of interest, and cited accepted methods.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	No confounding variables were noted.
	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 reported that influenced the outcome assessment.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Recovery and mass balance were omitted; however, sufficient data were reported to determine that the omissions were not likely to have had a substantial impact on the study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	There were omissions in results of statistical analysis; however, sufficient data were reported to determine that the omissions were not likely to have had a substantial impact on the study results.
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.

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Study Citation:	Smith, A. D., Bharath, A., Mallard, C., Orr, D., Mccarty, L. S., Ozburn, G. W. (1990). Bioconcentration kinetics of some chlorinated benzenes and chlorinated phenols in American flagfish, <i>Jordanella floridae</i> (Goode and Bean). Chemosphere 20(3-4):379-386.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	660540

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

Overall Quality Determination **High**

* Related References: ECHA rating: 2

Study Citation:	Steinert, S. A., Streib-Montee, R., Leather, J. M., Chadwick, D. B. (1998). DNA damage in mussels at sites in San Diego Bay. Mutation Research: Fundamental and Molecular Mechanisms of Mutagenesis 399(1):65-85.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	625931

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, and Guideline	None; Experimental; other: Non-guideline
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Test Organism and Test Organism Details	Mytilus edulis; Length range: 34.6 - 38.8 mm; Mean length 36.3±0.84 mm
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; Not reported; Not reported; 30 days
Media Type, TOC, and Salinity	natural sediment: brackish; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	Not reported; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	filter feeding; Not reported; measured
Test Type, Test Temperature, and Test Condition	field study; Not reported; 10 mussels were deployed to 6 sites in the San Diego Bay 1 m from the bottom
Comments	
Duration, Parameter, and Sampling Frequency	32 days; other; 11, 12 and 32d
Concentration	Not Reported
Analytical Method and Analytical Details	GC-ECD; gas chromatography/electron capture detection;
Rate Constant and Results per Recovery	Not reported; NR; internal standards applied
Statistics, Basis, and Calculation Basis	Not reported; organ w.w.; other
Results Value and Results Details	Mussel tissue bioaccumulation: 1.86; 1.84; 2.32; 1.83; 2.41; 1.86; 1.83 ng/g wet wt.; detected concentrations in sub-sample of soft tissues from 50 mussels at Time 0, and stations R1, R2, 4B, 4A, 7B, 7A
Metabolites, Reference, and Results Reference Substance	Not reported; sediment concentrations at stations R2, 7A, and 7B of 7.8, 42.7; 7.8; 42.7; 2.1 ng/g wet wt

EVALUATION			
Domain	Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High
	Metric 2:	Test Substance Purity	High
Domain 2: Test Design	Metric 3:	Study Controls	Medium
	Metric 4:	Test Substance Stability	Medium
Domain 3: Test Conditions			

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Study Citation:	Steinert, S. A., Streib-Montee, R., Leather, J. M., Chadwick, D. B. (1998). DNA damage in mussels at sites in San Diego Bay. Mutation Research: Fundamental and Molecular Mechanisms of Mutagenesis 399(1):65-85.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	625931			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	Low	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	The test conditions were consistent across samples or study groups. The conditions of the exposure were documented.
	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	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	Medium	The test organism or species is routinely used for similar study types; however, one or more additional characteristics of the organisms were not reported, but these omissions were not likely to have a substantial impact on study results.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 12:	Test Substance Purity	Medium	Minor limitations were identified in sampling methods of the outcome(s) of interest were reported (i.e., the sampling intervals were such that a half-life or other rate could be determined and/or pathways could be defined); however, the limitations were not likely to have a substantial impact on results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	The lipid content or lipid normalized BCF was not reported for BCF studies, but these deficiencies or omissions were not likely to have a substantial impact on study results.
	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:	Sum, D. T. H., M. Schipper, M., Opperhuizen, A. (1993). Toxicokinetics of halogenated benzenes in fish: Lethal body burden as a toxicological end point. Environmental Toxicology and Chemistry 12(6):1117-1127.
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	654569

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, and Guideline	None; Experimental; other: OECD guidelines for testing of chemicals, water solubility. Test guidelines 203
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	No; British Drug Houses Ltd. (Poole, England); NR; 95% Notes: 1,4-diCBz
Test Organism and Test Organism Details	guppies (Poecilia reticulata); 3 months old, average weight of 0.18±0.05 g, average length of 2.6±0.3 cm.
Lipid Content, Test Temperature, pH, and Depuration Time	measured, not reported; measured, not reported, did not change more than one degree; measured, not reported, did not change more than one unit; up to 4 days
Media Type, TOC, and Salinity	other; Not reported; Not reported
Dissolved Oxygen, Conductivity, and Hardness	2.3-8.7 mg/L; Not reported; Not reported
Exposure Route, Elimination, and Nominal Measurements	whole fish; Not reported; Measured
Test Type, Test Temperature, and Test Condition	semi-static; measured, not reported, did not change more than one degree; Fish (n=8-16) exposed in 12 L test vessel
Comments	
Duration, Parameter, and Sampling Frequency	Not reported; Log KL (L/kg fat; lipid-normalized bioconcentration factor = Kc/lipid fraction); 5, 10 or 30 minute intervals.
Concentration	0.8 - 57 µmol/L
Analytical Method and Analytical Details	Carlo Ebra 5360 Mega Series GC with spit/spitless injector and electron-capture detector (63 Ni-ECD).; Fish homogenized in a mortar, extracted under reflux with 1:1 water hexane. Water samples extracted with 2,2,4-trimethylpentane. Test chemical extracted in hexane and analyzed by GC-ECD; Extractable fat content determined gravimetrically.;
Rate Constant and Results per Recovery	760 L/kg/day (uptake); 4.8 /d (elimination); Extraction efficiencies were >90% in fish and water samples.
Statistics, Basis, and Calculation Basis	±0.1 (p<0.05); lipid weight; steady state
Results Value and Results Details	3.5; log Kc (L/kg; steady state bioconcentration factor based on first-order uptake rate constant and first-order elimination rate constant) = 1.7±0.2
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 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	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:	Sum, D. T. H.,M, Schipper, M., Opperhuizen, A. (1993). Toxicokinetics of halogenated benzenes in fish: Lethal body burden as a toxicological end point. Environmental Toxicology and Chemistry 12(6):1117-1127.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	654569			
Domain	Metric	EVALUATION		Comments
		Rating		
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 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	Medium	There were minor inconsistencies in test conditions across samples or study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established.
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	Test organism information was reported, including species or sex, age, and starting body weight.
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	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	High	The lipid-normalized bioconcentration factor (BCF) was 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 the study type.

Overall Quality Determination**High**

Study Citation:	Sum, D. T. H.,M, Schipper, M., Opperhuizen, A. (1993). Toxicokinetics of halogenated benzenes in fish: Lethal body burden as a toxicological end point. Environmental Toxicology and Chemistry 12(6):1117-1127.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	654569			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene			
Confidentiality, Type, and Guideline	None; Experimental; other: OECD guidelines for testing of chemicals, water solubility. Test guidelines 203			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	No; British Drug Houses Ltd. (Poole, England); NR; 95% Notes: 1,4-diCBz			
Test Organism and Test Organism Details	fathead minnows (Pimephales promelas); 3 months old, average weight of 0.39±0.12 g, average length of 3.6±0.4 cm.			
Lipid Content, Test Temperature, pH, and Depuration Time	measured, not reported; measured, not reported, did not change more than one degree; measured, not reported, did not change more than one unit; up to 4 days			
Media Type, TOC, and Salinity	other; Not reported; Not reported			
Dissolved Oxygen, Conductivity, and Hardness	6.8-9.5 mg/L; Not reported; Not reported			
Exposure Route, Elimination, and Nominal Measurements	whole fish; Not reported; Measured			
Test Type, Test Temperature, and Test Condition	semi-static; measured, not reported, did not change more than one degree; Fish (n=8-16) exposed in 12 L test vessel			
Comments				
Duration, Parameter, and Sampling Frequency	Not reported; Log KL (L/kg fat; lipid-normalized bioconcentration factor = Kc/lipid fraction); 5, 10 or 30 minute intervals.			
Concentration	0.62 - 46 µmol/L			
Analytical Method and Analytical Details	Carlo Ebra 5360 Mega Series GC with spit/spitless injector and electron-capture detector (63 Ni-ECD).; Fish homogenized in a mortar, extracted under reflux with 1:1 water hexane. Water samples extracted with 2,2,4-trimethylpentane. Test chemical extracted in hexane and analyzed by GC-ECD; Extractable fat content determined gravimetrically.;			
Rate Constant and Results per Recovery	600 L/kg/day (uptake); 2.5 /d (elimination); Extraction efficiencies were >90% in fish and water samples.			
Statistics, Basis, and Calculation Basis	p<0.05; lipid weight; steady state			
Results Value and Results Details	3.6; log Kc (L/kg; steady state bioconcentration factor based on first-order uptake rate constant and first-order elimination rate constant) = 2.4			
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 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	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.
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Study Citation:	Sum, D. T. H.,M, Schipper, M., Opperhuizen, A. (1993). Toxicokinetics of halogenated benzenes in fish: Lethal body burden as a toxicological end point. Environmental Toxicology and Chemistry 12(6):1117-1127.			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	654569			
Domain	Metric	EVALUATION		Comments
	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	Medium	There were minor inconsistencies in test conditions across samples or study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established.
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	Test organism information was reported, including species or sex, age, and starting body weight.
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	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	High	The lipid-normalized bioconcentration factor (BCF) was 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 the study type.

Overall Quality Determination**High**

Study Citation:	U.S. EPA, (2009). Initial risk-based prioritization of high production volume (HPV) chemicals: Chlorobenzenes category: Sponsored chemicals: Monochlorobenzene (CASRN 108-90-7) (CA Index Name: Benzene, chloro-); 1,2-Dichlorobenzene (CASRN 95-50-1) (CA Index Name: Benzene, 1,2-dichloro-); 1,3-Dichlorobenzene (CASRN 541-73-1) (CA Index Name: Benzene, 1,3-dichloro-); 1,2,3-Trichlorobenzene (CASRN 87-61-6) (CA Index Name: Benzene, 1,2,3-trichloro-).
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	5113349

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene
Confidentiality, Type, and Guideline	no; experimental; OECD Guideline 305 (Bioconcentration: Flow-through Fish Test) - [before 2 Oct 2012]
Solvent, Reactivity, Storage, Stability	Not Reported; Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, Purity	Not Reported; Not Reported; Not Reported; Not Reported
Test Organism and Test Organism Details	carp; 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	Not Reported; Not Reported; Not Reported
Comments	
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 = 64-68; 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 definitively (i.e., established nomenclature, CASRN, or structure reported, including information on the specific form tested [particle characteristics for solid-state materials, salt or base, valence state, isomer, etc.] for materials that may vary in form, or submitting company's code name with supporting confirmatory documentation) and the specific form characterized, where applicable.
	Metric 2:	Test Substance Purity	Medium	The test substance source was not reported and the test substance purity was low or not reported (e.g., lack of information on hydration state of a compound introduces uncertainty into concentration calculations); however, the omissions or identified impurities were not likely to have a substantial impact on the study results.

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Study Citation:	U.S. EPA, (2009). Initial risk-based prioritization of high production volume (HPV) chemicals: Chlorobenzenes category: Sponsored chemicals: Monochlorobenzene (CASRN 108-90-7) (CA Index Name: Benzene, chloro-); 1,2-Dichlorobenzene (CASRN 95-50-1) (CA Index Name: Benzene, 1,2-dichloro-); 1,3-Dichlorobenzene (CASRN 541-73-1) (CA Index Name: Benzene, 1,3-dichloro-); 1,2,3-Trichlorobenzene (CASRN 87-61-6) (CA Index Name: Benzene, 1,2,3-trichloro-).			
OECD Harmonized Template:	Aquatic Bioconcentration			
HERO ID:	5113349			
Domain		EVALUATION		Comments
		Metric	Rating	
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Some concurrent control group details were not included; however, more study details expected to be in the primary source.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; however, more study details expected to be in the primary source.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	Study details not reported but expected to be appropriate. More details expected in the primary source.
	Metric 6:	Testing Conditions	Medium	Testing conditions not reported but expected to be appropriate. More details expected in the primary source.
	Metric 7:	Testing Consistency	Medium	Testing conditions not reported but expected to be consistent. More details expected in the primary source.
	Metric 8:	System Type and Design	Medium	The system type and design were not reported but expected to be appropriate. More details expected in the primary source.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to the study.
	Metric 10:	Sampling Methods	Medium	Test organism information was not reported but expected to be appropriate. More details expected in the primary source.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	No methodology was reported but more data expected to be in the primary source.
	Metric 12:	Test Substance Purity	Medium	No sampling method reported but expected to be appropriate. More details expected in the primary source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	More details expected to be available in the primary source.
	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	Medium	No analytical method reported but expected to be appropriate. More details expected to be in the primary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.

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Study Citation:	U.S. EPA, (2009). Initial risk-based prioritization of high production volume (HPV) chemicals: Chlorobenzenes category: Sponsored chemicals: Monochlorobenzene (CASRN 108-90-7) (CA Index Name: Benzene, chloro-); 1,2-Dichlorobenzene (CASRN 95-50-1) (CA Index Name: Benzene, 1,2-dichloro-); 1,3-Dichlorobenzene (CASRN 541-73-1) (CA Index Name: Benzene, 1,3-dichloro-); 1,2,3-Trichlorobenzene (CASRN 87-61-6) (CA Index Name: Benzene, 1,2,3-trichloro-).
OECD Harmonized Template:	Aquatic Bioconcentration
HERO ID:	5113349

		EVALUATION		
Domain	Metric	Rating		Comments
Domain 8: Other	Metric 17:	Verification or Plausibility of Results	Medium	The study results were reasonable.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.

Overall Quality Determination

Medium

* Related References: cited from NITE (2002) HERO ID: 3808978 Chemicals Inspection and Testing Institute. 2008. Biodegradation and Bioaccumulation of the Existing Chemical Substances under the Chemical Substances Control Law. Japan Chemical Industry Ecology - Toxicology and Information Center

Study Citation:	Overcash, M. R., Weber, J. B. (1986). Behavior of organic compounds in land treatment systems with the presence of municipal sludge. :125-131.			
OECD Harmonized Template:	Terrestrial Bioconcentration			
HERO ID:	5243691			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
Confidentiality, EndPoint, Type, Guideline	None; bioaccumulation: terrestrial; Experimental; other: Guideline not specified, greenhouse study on the North Carolina State University campus (35.8 N, 78.6 W)			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	14C-labelled compounds and nonlabelled compounds used, no further details; NR; NR; NR			
Test Organism and Test Organism Details	other; Altona soybeans (Glycine max [L.] Merr.); Average height: 5.2 ± 1.1 cm (immature plant), 23 ± 3 cm (mature plant); Pioneer 3368A corn (Zea mays L.); average height 62 ± cm			
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 80°F; 5.0; Not reported			
Moisture, TOC, and Test Conditions Comments	60% (relative humidity); 1.5%; Test substance uniformly mixed with the top 15 cm of soil			
Nominal Measured and Time Plateau	0.20 mg/kg dry wt loading rate; 200 ppb; Not reported			
Duration, Parameter, and Sampling Frequency	Until plant maturity; Not Reported; Not reported			
Analytical Method and Analytical Details	Extracted liquid analyzed with scintillation spectrometer; total 14C determined in Harvey Biological Oxidizer; trapped carbon dioxide analyzed with scintillation spectrometer; Soil and plant extraction with hexane:acetone 1:1;			
Results Value, Result Type, and Results Standard Deviation	Average uptake as ppb extractable C14 in plants: 86±91 ppb (corn), 550±11 ppb (immature soybean plants), 100±30 ppb (mature soybean plants);			
Calculation Basis and Basis	Not Reported; Not Reported			
Elimination, Metabolites, Kinetic Parameter, and Statistics	other; whole body d.w.			
	Not Reported; Not reported; First order loss coefficient from soil: 0.10 / day; 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 and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	Concurrent controls were not explicitly included but they’re not required for uptake studies.
	Metric 4:	Test Substance Stability	High	The test substance preparation was reported and 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 were reported and appropriate.
	Metric 7:	Testing Consistency	High	The test conditions were consistent across replicates and study groups.
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Study Citation:	Overcash, M. R., Weber, J. B. (1986). Behavior of organic compounds in land treatment systems with the presence of municipal sludge. :125-131.			
OECD Harmonized Template:	Terrestrial Bioconcentration			
HERO ID:	5243691			
Domain		Metric	EVALUATION Rating	Comments
	Metric 8:	System Type and Design	High	Equilibrium was established and the system type and design were capable of appropriately maintaining the substance.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	Medium	The test organism species is routinely used for similar study types; however, organism details such as weight was not reported.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The relation of the measured plant concentrations to soil uptake were not well reported.
	Metric 12:	Test Substance Purity	High	Sampling methods and approaches addressed the outcome assessment.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability between study groups was qualitatively accounted for in the outcome assessment, but not numerically with statistics.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	No differences in organism attrition or health were reported.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Lipid normalized BCF was not reported, target chemical concentrations difficult to make meaningful.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Kinetics were described briefly.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Difficult to determine if results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	Overcash, M. R., Weber, J. B. (1986). Behavior of organic compounds in land treatment systems with the presence of municipal sludge. :125-131.			
OECD Harmonized Template:	Terrestrial Bioconcentration			
HERO ID:	5243691			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
Confidentiality, EndPoint, Type, Guideline	None; bioaccumulation: terrestrial; Experimental; other: Guideline not specified, greenhouse study on the North Carolina State University campus (35.8 N, 78.6 W)			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	14C-labelled compounds and nonlabelled compounds used, no further details; NR; NR; NR			
Test Organism and Test Organism Details	other; Kentucky 31 tall fescue (Festuca arundinacea Schreb.); Average height: 24 ± 6 cm; Butte wheat (Triticum aestivum L.), Average height: 30±4 cm (immature plant), 52 ± 4 cm (mature plant)			
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 80°F; 5.0; Not reported			
Moisture, TOC, and Test Conditions Comments	60% (relative humidity); 1.5%; Test substance uniformly mixed with the top 15 cm of soil			
Nominal Measured and Time Plateau	0.20 mg/kg dry wt loading rate; 200 ppb; Not reported			
Duration, Parameter, and Sampling Frequency	Until plant maturity; Not Reported; Not reported			
Analytical Method and Analytical Details	Extracted liquid analyzed with scintillation spectrometer; total 14C determined in Harvey Biological Oxidizer; trapped carbon dioxide analyzed with scintillation spectrometer; Soil and plant extraction with hexane:acetone 1:1;			
Results Value, Result Type, and Results Standard Deviation	Average uptake as ppb extractable C14 in plants: 1,400±180 ppb (Fescue), 1,000 ppb(immature wheat), 94±14 ppb (mature wheat); Not Reported; Not Reported			
Calculation Basis and Basis	other; whole body d.w.			
Elimination, Metabolites, Kinetic Parameter, and Statistics	Not Reported; Not reported; First order loss coefficient from soil: 0.10 / day; 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 and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	Concurrent controls were not explicitly included but they’re not required for uptake studies.
	Metric 4:	Test Substance Stability	High	The test substance preparation was reported and 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 were reported and appropriate.
	Metric 7:	Testing Consistency	High	The test conditions were consistent across replicates and study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established and the system type and design were capable of appropriately maintaining the substance.
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Study Citation:		Overcash, M. R., Weber, J. B. (1986). Behavior of organic compounds in land treatment systems with the presence of municipal sludge. :125-131.		
OECD Harmonized Template:		Terrestrial Bioconcentration		
HERO ID:		5243691		
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study type.
	Metric 10:	Sampling Methods	Medium	The test organism species is routinely used for similar study types; however, organism details such as weight was not reported.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The relation of the measured plant concentrations to soil uptake were not well reported.
	Metric 12:	Test Substance Purity	High	Sampling methods and approaches addressed the outcome assessment.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability between study groups was qualitatively accounted for in the outcome assessment, but not numerically with statistics.
	Metric 14:	Health Outcomes Unrelated to Exposure	High	No differences in organism attrition or health were reported.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Lipid normalized BCF was not reported, target chemical concentrations difficult to make meaningful.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Kinetics were described briefly.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Difficult to determine if results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	San Miguel, A., Ravanel, P., Raveton, M. (2013). A comparative study on the uptake and translocation of organochlorines by <i>Phragmites australis</i> . Journal of Hazardous Materials 244:60-69.			
OECD Harmonized Template:	Terrestrial Bioconcentration			
HERO ID:	1968363			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene			
Confidentiality, EndPoint, Type, Guideline	None; bioaccumulation: terrestrial; Experimental; other			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	yes; Sigma-Aldrich; NR; 99%			
Test Organism and Test Organism Details	other; <i>Phragmites australis</i> , fresh and dead roots			
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; Not reported; Not reported; Not reported			
Moisture, TOC, and Test Conditions Comments	Not reported; Not reported; plants exposed to solutions containing 120 Bq/mL			
Nominal Measured and Time Plateau	Not reported; Not reported			
Duration, Parameter, and Sampling Frequency	28 days; Not Reported; 7, 14, 21 and 28 days			
Analytical Method and Analytical Details	scintillation counting; Not reported;			
Results Value, Result Type, and Results Standard Deviation	Root concentration factor RCF + Cr/Cw = 16.03±10.10, 21.15±18.69, 18.24±4.83, and 75.56±25.39 measured at 7, 14, 21 and 28 days, respectively; Not Reported; Not Reported			
Calculation Basis and Basis	Not Reported; Not Reported			
Elimination, Metabolites, Kinetic Parameter, and Statistics	Not reported; Not reported; Not reported; 95% confidence level (p-value < 0.05)			
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 and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Uninformative	Analytical controls were not included.
	Metric 4:	Test Substance Stability	Low	The sample stability and storage conditions were not reported and these factors likely influenced the test substance or were likely to have had a substantial impact on the study results.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	High	The method was suitable.
	Metric 6:	Testing Conditions	Uninformative	Test conditions were not reported.
	Metric 7:	Testing Consistency	Low	Limited detail regarding this metric.
	Metric 8:	System Type and Design	N/A	The metric is not applicable to this study type.

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Study Citation:	San Miguel, A., Ravanel, P., Raveton, M. (2013). A comparative study on the uptake and translocation of organochlorines by Phragmites australis. Journal of Hazardous Materials 244:60-69.			
OECD Harmonized Template:	Terrestrial Bioconcentration			
HERO ID:	1968363			
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	Low	Limited detail regarding this metric; non-standard species.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Low	The analytical method details were not reported.
	Metric 12:	Test Substance Purity	Low	Samples methods were not clearly reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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	The analytical method details were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical analysis was reported.
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

Uninformative

Study Citation:	Wang, M. J., Jones, K. C. (1994). Uptake of chlorobenzenes by carrots from spiked and sewage sludge-amended soil. Environmental Science & Technology 28(7):1260-1267.
OECD Harmonized Template:	Terrestrial Bioconcentration
HERO ID:	647188

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, EndPoint, Type, Guideline	None; bioaccumulation: terrestrial; Experimental; other: Soil uptake of chemicals from spiked sewage and sludge-amended soils by carrot foliage and roots
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Test Organism and Test Organism Details	other; Daucus carota
Lipid Content, Test Temperature, pH, and Depuration Time	Not reported; 20-30°C; Not reported; Not reported
Moisture, TOC, and Test Conditions Comments	Not reported; control soil 2.38% OC, soil spiked with CB 2.46% OC, low rate sludge amended soils 2.69% OC, high rate sludge amended soils 4.88% OC; Carrot seeds were planted in a control soil, soil spiked with CB, and 2 sludge amended soils; carrots harvested after 100d, separated into root and above-ground parts
Nominal Measured and Time Plateau	Measured; was assumed that no compound loss occurred from other processes; Not reported
Duration, Parameter, and Sampling Frequency	100 days; other; Not reported
Analytical Method and Analytical Details	Not reported; Recoveries from carrots 66-93%; from soils 82-97%;
Results Value, Result Type, and Results Standard Deviation	BCF in foliage: Control soil = 3.1, soil spiked with CB = 1.3, low rate sludge amended soils = 2.5, high rate sludge amended soils = 1.5; BCF; Not Reported
Calculation Basis and Basis	kinetic; other
Elimination, Metabolites, Kinetic Parameter, and Statistics	Measured concentrations (ug/kg) of target before sowing, after harvest in control soil 5.9, 2.6; in spiked soil 16, 11, low rate 10, 7.4, high rate 38, 30 (std dev reported in table); Not reported; Growth; BCF defined as ratio of concentrations in the carrot shoot tissues and the soils; 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 test substance source and purity were not reported.
Domain 2: Test Design			
	Metric 3: Study Controls	High	Appropriate control groups included for this type of study.
	Metric 4: Test Substance Stability	Medium	The test substance stability, homogeneity, preparation and 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 appropriate for the method.

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Study Citation:	Wang, M. J., Jones, K. C. (1994). Uptake of chlorobenzenes by carrots from spiked and sewage sludge-amended soil. Environmental Science & Technology 28(7):1260-1267.			
OECD Harmonized Template:	Terrestrial Bioconcentration			
HERO ID:	647188			
EVALUATION				
Domain		Metric	Rating	Comments
	Metric 7:	Testing Consistency	High	The test conditions were consistent.
	Metric 8:	System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.
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.
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	This metric met the criteria for high confidence as expected for this type of study.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Other loss processes; biotic/abiotic loss assumed to be null
	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	This metric met the criteria for medium confidence as expected for this type of study; analytical details were omitted.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study type.
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			High	

Study Citation:	Barber, L. B., Thurman, E. M., Schroeder, M. P., Leblanc, D. R. (1988). Long-term fate of organic micropollutants in sewage-contaminated groundwater. Environmental Science & Technology 22(2):205-211.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	596429

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Calculation; other: Retardation factors in aquifers
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: 14 mg/L water containing a mixture of approx. 1.0 or 2.0 mg/L of 12 organic pollutants
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; Calculation based on aquifer characteristics consisting of stratified sand and gravel
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; foc = 0.001; Not reported
Bulk Density and Matrix Details	grain density = 2.60 g/cm ³ ; total porosity = 0.30
Media, Recovery, and Statistics	fraction of material = 0.05 um; 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	Not reported; Not reported; Not reported; Not reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Retardation factor R _f ; 1.1
Partition Coefficient Phase and Partition Coefficient Results	solids-water in sediment; Calculated using aquifer properties described and log K _{ow} from literature = 3.39
Mass Balance	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 test substance source and purity were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Control groups were not included; however, the lack of data was not likely to have a substantial impact on study results.
	Metric 4:	Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.

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Study Citation:	Barber, L. B., Thurman, E. M., Schroeder, M. P., Leblanc, D. R. (1988). Long-term fate of organic micropollutants in sewage-contaminated groundwater. Environmental Science & Technology 22(2):205-211.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	596429			
Domain	Metric	EVALUATION		Comments
		Rating		
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	N/A		The metric is not applicable to this study type.
	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	N/A		The metric is not applicable to this study type.
Domain 6: Confounding/Variable Control				
	Metric 13: Confounding Variables	N/A		The metric is not applicable to this study type.
	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		This metric met the criteria for high confidence as expected for this type of study.
	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	Medium		The study results were reasonable; considering known Kow, Koc; no serious deficiencies were identified, and the value is plausible.
	Metric 18: QSAR Models	N/A		The metric is not applicable to this study type.
Overall Quality Determination		High		

Study Citation:	Brusseau, M. L., Reid, M. E. (1991). Nonequilibrium sorption of organic chemicals by low organic-carbon aquifer materials. Chemosphere 22(3-4):341-350.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	5251817

EXTRACTION	
Parameter	Data
CASRN and Test Material	not reported; 1,4-dichlorobenzene
Confidentiality, Type, Guideline	No; experimental; other: Non-guideline: miscible-displacement method for non-equilibrium sorption
Solvent, Reactivity, Storage, Stability	Distilled water containing 0.005 M CaSO ₄ and 0.02% NaN ₃ ; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; analytical grade Notes: NR
Sampling Frequency, Sampling Details, and Number of Replicates	continuous; sampling was eliminated as effluent was analyzed by a flow-through detection method; not reported
pH, Test Temperature, Buffer, and Test Details	not reported; not reported; not reported; Packed column (operating at 1 and 2 ml/min) effluent analyzed directly via a flow-through detection method
Matrix, Clay Silts and Organic Carbon, and CEC	other; less than 0.05% organic carbon; not reported
Bulk Density and Matrix Details	not reported; Columns saturated with electrolyte solution: 0.005M CaSO ₄ , 0.02% NaN ₃ in distilled water
Media, Recovery, and Statistics	Columbus aquifer material; properties reported in another study; Total recovery of all solute mass that entered the column; not reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	not reported; not reported; Desorption rate constant: 28.0 hr ⁻¹
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	K _p (equilibrium sorption constant) = 0.03; Dispersive-flux contribution to transport P: 100; Retardation factor R: 1.13; Fraction of instantaneous retardation $\hat{P}$: 0.97; Ratio of hydrodynamic residence time to characteristic time of sorption $\hat{Y}$: 0.3; fraction of sorbent for which sorption is instantaneous F = 0.74; Miscible displacement analyzed by a one-dimensional advective-dispersive transport model, with first-order bicontinuum description of sorption.; 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	study reports mass recovery was complete for all experiments

EVALUATION			
Domain	Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High
	Metric 2:	Test Substance Purity	Medium
Domain 2: Test Design	Metric 3:	Study Controls	Medium

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Study Citation:	Brusseau, M. L., Reid, M. E. (1991). Nonequilibrium sorption of organic chemicals by low organic-carbon aquifer materials. Chemosphere 22(3-4):341-350.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5251817			
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	Medium	There were omissions in testing conditions and soil characteristics (cited to another study).
	Metric 7:	Testing Consistency	High	Reported test conditions were consistent across samples.
	Metric 8:	System Type and Design	High	The system type and design was described and appropriate.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this study.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this study.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed or reported the intended outcome.
	Metric 12:	Test Substance Purity	High	The study reported the use of sampling methods that address the outcome.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Analytical details, target chemical concentrations, extraction efficiency, percent recovery 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	Calculations were described clearly.
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.

Overall Quality Determination**High**

Study Citation:	Carmichael, L. M., Smith, T. G., Pardieck, D. L. (1999). Site-specific sorption values for mixtures of volatile and semivolatile organic compounds in sandy soils. Journal of Environmental Quality 28(3):888-897.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	1487294

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; other: Column desorption studies used for the determination of site-specific partition coefficients, Kd, in subsurface, low organic soils and ground water from Toms River superfund site in NJ.
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	No; Aldrich, Inc.; NR; NR Notes: used without further purification
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Not reported; 3
pH, Test Temperature, Buffer, and Test Details	6.02; 15C; Not reported; Sorption isotherms developed in soil core packed columns with uncontaminated ground water
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; sand: 970 g/kg, silt and clay: 30 g/kg; conductivity: 500 mg/L as Cl-
Bulk Density and Matrix Details	Bulk density: 1.60 g/cm3; uncontaminated experimental soil composed of quartz sand coated with iron oxides and hydroxides
Media, Recovery, and Statistics	uncontaminated groundwater; Not reported; Not reported
Transformation Products, Equilibrium	Not reported; Not reported; Not reported
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	Not reported; Not reported; Not reported; Not reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Kd (L/kg) mean using 3 soil cores; 0.078 (±0.068)
Partition Coefficient Phase and Partition Coefficient Results	soil-water; calculated using $R = (V_{ta}) \times (V_{br})^{-1} = 1 + (p \cdot n^{-1})K_d$
Mass Balance	Not reported

EVALUATION				
Domain	Metric		Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified clearly.
	Metric 2:	Test Substance Purity	Low	Source and purity were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Low	Controls were not reported.

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Study Citation:	Carmichael, L. M., Smith, T. G., Pardieck, D. L. (1999). Site-specific sorption values for mixtures of volatile and semivolatile organic compounds in sandy soils. Journal of Environmental Quality 28(3):888-897.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1487294			
Domain	Metric	EVALUATION		Comments
	Metric 4:	Test Substance Stability	Low	The test substance stability, homogeneity, preparation, and storage conditions were not reported and these factors may influenced the test substance or are likely to have a substantial 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	Low	Several details were omitted.
	Metric 7:	Testing Consistency	Medium	Limited detail regarding this metric.
	Metric 8:	System Type and Design	High	The system type and design were appropriate.
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	This metric is not applicable to this type of study.
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	Limited detail regarding this metric.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	This metric is not applicable to this type of study.
	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	concentrations of the target chemical or transformation product(s), extraction efficiency, percent recovery, or mass balance were not measured or reported, preventing meaningful interpretation of study results
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Limited detail regarding this metric.
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:	Chen, W., Kan, A. T., Fu, G., Vignona, L. C., Tomson, M. B. (1999). Adsorption-desorption behaviors of hydrophobic organic compounds in sediments of Lake Charles, Louisiana, USA. Environmental Toxicology and Chemistry 18(8):1610-1616.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	652333			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene			
Confidentiality, Type, Guideline	None; Experimental; other: Non-guideline study of repetitive desorption behaviors of aged compounds in the sediments			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; sediment contaminant; 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; mean solid phase concentration in sediment = 16.7 ug/g			
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; organic fraction: 4.1%; Inorganic fraction: quartz; 31.2% moisture; Not reported			
Bulk Density and Matrix Details	Not reported; 1.4 g of sediments and 40 ml of solution			
Media, Recovery, and Statistics	Lake Charles sediments; 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	Not reported; Not reported; Not reported; Not reported			
Partition Coefficient Type and Partition Coefficient Results	Desorption log Koc; 5.73			
Partition Coefficient Phase and Partition Coefficient Results	sediment-water; log Koc = log[q/C]/OC, where q (ug/g) and C (ug/ml) are the solid- and aqueous-phase contaminant concentrations at the last desorption step and OC (0.041 g/g) is the fractional soil organic carbon content.			
Mass Balance	Data are calculated from the chemical mass balance.			
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	Medium	The test substance source was reported; however, the purity was not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Uninformative	The study did not include control groups.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation and 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:	Chen, W., Kan, A. T., Fu, G., Vignona, L. C., Tomson, M. B. (1999). Adsorption-desorption behaviors of hydrophobic organic compounds in sediments of Lake Charles, Louisiana, USA. Environmental Toxicology and Chemistry 18(8):1610-1616.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	652333			
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	Low	Testing condition details were omitted.
	Metric 7:	Testing Consistency	N/A	Not applicable; multiple study groups were not reported.
	Metric 8:	System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.
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	This metric met the criteria for high confidence as expected for this type of study.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	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	Uninformative	The target chemical concentrations, extraction efficiency, percent recovery, and mass balance were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	The study results were reasonable, controls not included.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			Uninformative	

Study Citation:	Chiou, C. T., Kile, D. E., Malcolm, R. L. (1988). Sorption of vapors of some organic liquids on soil humic acid and its relation to partitioning of organic compounds in soil organic matter. Environmental Science & Technology 22(3):298-303.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	2801853

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Calculation; other: Estimated soil-water partitioning based on measured highly linear sorption isotherms of organic vapors on soil humic acid
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; Experimental data: Room temperature: 23±1°C; Not reported; Static vapor sorption chamber used to determine limiting sorption capacity for polar and non-polar compounds on soil humic acids; approximate K_{om} values were calculated using the results and defined equations using specific compounds water solubility
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 58.03% carbon, 3.64% hydrogen, 33.59% oxygen, 3.26% nitrogen, 0.47% sulfur, 0.10% phosphorus on a moisture free, ash-free basis; Not reported
Bulk Density and Matrix Details	Not reported; Water solubility used for calculation = 72 mg/L
Media, Recovery, and Statistics	Experimental data: Sanhedron soil humic acid; Not reported; Not reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not reported; Sorption equilibrium for experimental data was signified by constant sample weight and constant partial pressure of the vapor in the system (ca. 2-3h); Not reported
Reference Substance, Reference Substance Results, and Percent Adsorption	Literature value of observed Partition coefficient of solute between soil organic matter and water; 2.20; 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	Partition coefficient of solute between soil organic matter and water; log K_{om} = 2.52
Partition Coefficient Phase and Partition Coefficient Results	soil-water; Estimate based on calculated limiting partition capacity
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 chemical name.
	Metric 2:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 2: Test Design				

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Study Citation:	Chiou, C. T., Kile, D. E., Malcolm, R. L. (1988). Sorption of vapors of some organic liquids on soil humic acid and its relation to partitioning of organic compounds in soil organic matter. Environmental Science & Technology 22(3):298-303.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	2801853			
Domain	Metric	EVALUATION		Comments
	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	N/A	The metric is not applicable to this study type.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	There were omissions in the test method details; however, these omissions were not likely to have a substantial impact on study results.
	Metric 6:	Testing Conditions	Medium	There were omissions in testing conditions (e.g., temperature was not reported); 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	N/A	The metric is not applicable to this study type.
	Metric 8:	System Type and Design	High	Equilibrium was established. The system type and design were capable of appropriately maintaining substance concentrations.
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	Medium	The outcome assessment methodology addressed the intended outcome of interest; however a portioning coefficient was not reported.
	Metric 12:	Test Substance Purity	Low	The study did not report details on sampling methods.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Sources of variability and uncertainty were reported.
	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	The chemical concentrations, extraction efficiency, percent recovery, or mass balance were not reported for the experimental data set; and these omissions may prevent meaningful interpretation of study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	There were omissions in the statistical methods or kinetic calculations however, the lack of information is not likely to have a substantial impact on study results.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results were reasonable.

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Study Citation:	Chiou, C. T., Kile, D. E., Malcolm, R. L. (1988). Sorption of vapors of some organic liquids on soil humic acid and its relation to partitioning of organic compounds in soil organic matter. Environmental Science & Technology 22(3):298-303.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	2801853

		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 18:	QSAR Models	Medium	The detail on the experimental data set is limited; however the calculation basis is clearly presented and in close agreement with literature values.

Overall Quality Determination	Medium
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Study Citation:	Chiou, C. T., Porter, P. E., Schmedding, D. W. (1983). Partition equilibriums of nonionic organic compounds between soil organic matter and water. Environmental Science & Technology 17(4):227-231.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	5178813

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; other: Sorption of 1,4-dichlorobenzene on Woodburn silty loam soil.
Solvent, Reactivity, Storage, Stability	Water; NR; Stock aqueous solutions were made at 50°C. Excess 1,2-DCB was removed by centrifugation.; NR
Radiolabel, Source, State, Purity	NR; Analabs, Aldrich, and Mallinckrodt; NR; Reagent grade
Sampling Frequency, Sampling Details, and Number of Replicates	One time; Samples were centrifuged for 1 hour after a 24 hour equilibration period and supernatant was extracted with hexane before GC analysis.; Not reported
pH, Test Temperature, Buffer, and Test Details	Not reported; 20°C; Not reported; Soil (Woodburn silty loam) solution mixtures were equilibrated in 30mL screw-capped centrifuge tubes for 24h on a mechanical shaker.
Matrix, Clay Silts and Organic Carbon, and CEC	silt loam; 21% clay/68% silt/9% sand/1.9% organic matter; 14 mequiv/100g soil
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	Not reported; Not reported; Not reported; Not reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Log (Soil organic matter-water distribution coefficient); 2.20
Partition Coefficient Phase and Partition Coefficient Results	Not Reported; Small corrections were made based on the Henry's law constant for volatilization losses. Sorption to glass walls was found to be insignificant and was not corrected for. Kom values were obtained from the slopes of the isotherms divided by the organic matter content of the soil.
Mass Balance	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	High	The test substance purity was reported and appropriate.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Autoclaved controls were not used; however, the omission is unlikely to have a substantial impact on the study results.

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Study Citation:	Chiou, C. T., Porter, P. E., Schmedding, D. W. (1983). Partition equilibriums of nonionic organic compounds between soil organic matter and water. Environmental Science & Technology 17(4):227-231.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5178813			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 4:	Test Substance Stability	High	The preparation of the test substance was reported and suitable.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable and the test substance was not tested above its aqueous solubility.
	Metric 6:	Testing Conditions	High	The testing conditions were reported and appropriate.
	Metric 7:	Testing Consistency	Medium	Multiple sample groups were not reported; however, the omissions is unlikely to have a substantial impact on the study results.
	Metric 8:	System Type and Design	Medium	Equilibrium was not clearly established; however, the omission is unlikely to have a substantial impact on the study 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 inoculum type was described and appropriate.
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 method was reported and appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Sources of uncertainty were not reported; however, the omissions are 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 results.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The analytical method was suitable and the data reporting was appropriate.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were reported and 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 the study type.
Overall Quality Determination		High		

Study Citation:	Chiou, C. T., Shoup, T. D. (1985). Soil sorption of organic vapors and effects of humidity on sorptive mechanism and capacity. Environmental Science & Technology 19(12):1196-1200.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	1993731

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; p-dichlorobenzene
Confidentiality, Type, Guideline	None; experimental; other: vapor sorption to soil.
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; Aldrich Chemical Co.; NR; reagent-grade Notes: used as received
Sampling Frequency, Sampling Details, and Number of Replicates	about 8 hours contact time; Diluted to appropriate concentrations for analysis.; not reported
pH, Test Temperature, Buffer, and Test Details	not reported; 20°C; not applicable; dynamic vapor-sorption apparatus
Matrix, Clay Silts and Organic Carbon, and CEC	silty clay; 21% clay/68% silt/9% sand/1.9% organic matter; not reported
Bulk Density and Matrix Details	not reported; dried Woodburn soil (<2.5% moisture)
Media, Recovery, and Statistics	vapor phase/soil; >97%; Not Reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	not reported; Normally, an exposure time of about 4 h was sufficient for establishing the sorption equilibrium.; not applicable
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	monolayer adsorption capacity; 5.64 mg/g of soil; molar adsorption heat=15.0 kcal/mol (determined from vapor pressure data); 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 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	N/A	The metric is not applicable to this study type.
	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:	Chiou, C. T., Shoup, T. D. (1985). Soil sorption of organic vapors and effects of humidity on sorptive mechanism and capacity. Environmental Science & Technology 19(12):1196-1200.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1993731			
Domain		Metric	EVALUATION Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	Nominal estimates of media concentrations were provided, but, the levels were not measured or suitable to the study type or outcome(s) of interest, these deviations or omissions were not likely to have a substantial impact on study results.
	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	Medium	Some test conditions across samples or study groups were not reported, but these discrepancies were not likely to have a substantial impact on study results.
	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	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	Medium	There was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	Metric 12:	Test Substance Purity	Medium	Minor limitations were identified in sampling methods of the outcome(s) 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	Medium	Sources of variability and uncertainty in the measurements and statistical techniques were reported in the study and were not likely to have a substantial impact on 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	No statistical analyses were conducted; however, sufficient data were provided to conduct an independent statistical analysis.
Domain 8: Other				

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Study Citation:	Chiou, C. T., Shoup, T. D. (1985). Soil sorption of organic vapors and effects of humidity on sorptive mechanism and capacity. Environmental Science & Technology 19(12):1196-1200.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	1993731

		EVALUATION		
Domain	Metric	Rating	Comments	
	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:	Cornelissen, G., Rigterink, H., Vrind, B. A., Tenhulscher, T. E. M., Ferdinandy, M. M. A., Vannoort, P. C. M. (1997). Two-stage desorption kinetics and in situ partitioning of hexachlorobenzene and dichlorobenzenes in a contaminated sediment. Chemosphere 35(10):2405-2416.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	2158356

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; other: Tenax solid-phase extraction method
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Aldrich; NR; >98% Notes: 1,4-DCB
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Not reported; 3
pH, Test Temperature, Buffer, and Test Details	Not reported; 20°C; Not reported; Sediment desorption kinetics using a mix of Tenax TA (0.5 g), sediment (1 g), milli-Q water (70 mL), HgCl (1 mg) as biocide; duration 330 h
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 2.0-4.2% OC; Not reported
Bulk Density and Matrix Details	Not reported; Sediment sampled June 1996 from the harbor of Delfzijl, The Netherlands; sediment had been dredged since 1994 and since then stored in a landfill; 1,4DCB detected in the sediments range from 2.5-6.0 mg/kg
Media, Recovery, and Statistics	Not reported; loss due to evaporation during centrifugation ca. 30%; corrected for by analyzing spiked solutions before and after centrifugation; Not reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not reported; Not reported; first order desorption
Reference Substance, Reference Substance Results, and Percent Adsorption	Not reported; Not reported; slowly desorbing fractions 36-63%
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	log Koc; 2.89±0.01
Partition Coefficient Phase and Partition Coefficient Results	sediment-water; organic carbon-normalized in situ partition coefficient
Mass Balance	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	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Low	Controls were not included.

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Study Citation:	Cornelissen, G., Rigterink, H., Vrind, B. A., Tenhulscher, T. E. M., Ferdinandy, M. M. A., Vannoort, P. C. M. (1997). Two-stage desorption kinetics and in situ partitioning of hexachlorobenzene and dichlorobenzenes in a contaminated sediment. Chemosphere 35(10):2405-2416.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	2158356			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity and 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	Testing conditions were not fully reported; 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	High	The system type and design were appropriate.
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	This metric is not applicable to the study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome assessment methodology addressed and 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, percent recovery, and 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	Kinetic calculations were clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Controls were not included or reported; the study results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

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Study Citation:	Cornelissen, G., Rigterink, H., Vrind, B. A., Tenhulscher, T. E. M., Ferdinandy, M. M. A., Vannoort, P. C. M. (1997). Two-stage desorption kinetics and in situ partitioning of hexachlorobenzene and dichlorobenzenes in a contaminated sediment. Chemosphere 35(10):2405-2416.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	2158356

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Determination		High	

Study Citation:	Djohan, D., Yu, J., Connell, D. (2017). Partition kinetics of chlorobenzenes in a sediment-water system. Chemosphere 186:938-947.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4912121

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	in 100 µL acetone; NR; NR; NR
Radiolabel, Source, State, Purity	NA; British Drug Houses; NR; >97% (GC-ECD analysis)
Sampling Frequency, Sampling Details, and Number of Replicates	0.17, 1, 4, 12, 24, and 48 h; Water and sediment analyzed; 2
pH, Test Temperature, Buffer, and Test Details	Not reported; Not reported; Not reported; 2 g dry sediment spiked with 600 ug test substance in glass bottle, left for 5 mins for the solvent to be volatilized, then addition of 0.01 M CaCl ₂ and distilled water, shaken on vertical rotary shaker
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; Fraction organic carbon 0.046; Not reported
Bulk Density and Matrix Details	Not reported; Sediment collected from a creek in Brookfield, Brisbane, Queensland, Australia
Media, Recovery, and Statistics	Distilled water; sediment to water ratio 0.008 kg/L; 90%; Not Reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; 0.17, 1, 4, 12, 24, and 48 h on rotary shaker, equilibrium reached at 10.8 h; Not reported
Reference Substance, Reference Substance Results, and Percent Adsorption	Not reported; Not reported; 21%
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	log K _{oc} ; 2.91 L/kg o.c.; Adsorption rate constant: 0.54 / hr ; 15.3 L / (kg hr)Desorption rate constant: 0.41 / hrSediment initial conc.: 300,000 ug/kgEquilibrium conc. mean of measurements at 12, 24, 48 hSediment eq. conc.: 63,000±3600 ug/kgWater eq. conc.: 1800±120 ug/LTime to establish equilibrium: 10.8 hr; Not Reported
Partition Coefficient Type and Partition Coefficient Results	Not Reported; Not Reported
Partition Coefficient Phase and Partition Coefficient Results	sediment-water; 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 by name.
	Metric 2:	Test Substance Purity	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Negative controls were not explicitly included.
	Metric 4:	Test Substance Stability	High	Test substance solvent and initial concentration were reported.
Domain 3: Test Conditions				

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Study Citation:	Djohan, D., Yu, J., Connell, D. (2017). Partition kinetics of chlorobenzenes in a sediment-water system. Chemosphere 186:938-947.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	4912121			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Organic carbon fraction of the sediment was reported, temperature, pH, or other characteristics were not included.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups and replicates.
	Metric 8:	System Type and Design	High	Equilibrium was established and the system was capable of maintaining test substance concentrations.
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	Medium	Sampling methods addressed the outcomes of interest however sample collection and extraction were reported in a previous study, Djohan et al. 2005
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability was addressed by statistical techniques between replicates.
	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 method was appropriate, limits of detection and extraction recovery were reported.
	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	High	The results were reasonable based on the method were comparable to findings from a previous study.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	Djohan, D., Yu, Q., Connell, D. W. (2005). Partition isotherms of chlorobenzenes in a sediment-water system. Water, Air, and Soil Pollution 161(1-4):157-173.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	2298263

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; other
Solvent, Reactivity, Storage, Stability	Acetone (0.1 mL); NR; NR; NR
Radiolabel, Source, State, Purity	NR; BDH; NR; $\geq 97\%$, confirmed by GC-ECD Notes: 1,4-DCB
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; sediment samples extracted with hexane–acetone mixture (1:1, v/v) via sonication; water samples extracted with hexane; five sets of spiked amounts (150–2400 μg 1,4-DCB) in two replicates
pH, Test Temperature, Buffer, and Test Details	Not reported; $23 \pm 2^\circ\text{C}$; Not reported; Rotary shaker used to mix sediment and water for 24hr to establish equilibrium; partition isotherms analyzed using linear and Langmuir isotherm models
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; OC 4.6%; Not reported
Bulk Density and Matrix Details	Not reported; natural creek sediment from Brookfield in Brisbane, Queensland, Australia
Media, Recovery, and Statistics	Distilled water; 86–90% recovery for chlorobenzenes in sediment extracts; 91–95% recovery for chlorobenzenes in water extracts; R-squared, regression coefficient of the best fit linear line
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not reported; Not reported; 24hr equilibration time based on the observed equilibrium time of chlorobenzenes in the sediment–water system from previous experiments with same experimental conditions
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 Kd, Kd: linear partition coefficient (with an intercept) (L/kg); log Kd = 1.57 Kd = 37; Kd = 42: linear partition coefficient (passing through the origin) (R-squared 0.94); Not reported
Partition Coefficient Type and Partition Coefficient Results	log Koc, Koc (linear partition coefficient); log Koc, L, Koc, L (Normalized Langmuir coefficient) (L/kg); 2.90, 800; 3.11, 1300
Partition Coefficient Phase and Partition Coefficient Results	sediment-water; Normalized Langmuir coefficient: R-squared 0.93; linear partition coefficient: R-squared 0.97
Mass Balance	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	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Low	The study did not include control groups.

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Study Citation:	Djohan, D., Yu, Q., Connell, D. W. (2005). Partition isotherms of chlorobenzenes in a sediment-water system. Water, Air, and Soil Pollution 161(1-4):157-173.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	2298263			
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	Medium	There were reported deviations or omissions in testing conditions (pH; sediment characterization).
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	High	Equilibrium was established.
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	N/A	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	Mass balance was not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods and calculations were clearly described and addressed the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5017839			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene			
Confidentiality, Type, Guideline	no; experimental; other: not specified			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR			
Sampling Frequency, Sampling Details, and Number of Replicates	NR; NR; NR			
pH, Test Temperature, Buffer, and Test Details	NR; NR; NR; NR			
Matrix, Clay Silts and Organic Carbon, and CEC	other; 0.08% organic carbon; NR			
Bulk Density and Matrix Details	NR; Sediment (63 < Ø < 125 μm)			
Media, Recovery, and Statistics	NR; NR; NR			
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NR; NR; NR			
Reference Substance, Reference Substance Results, and Percent Adsorption	NR; NR; NR			
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption	NR; NR; Not Reported; NR			
Desorption Type	NR; NR; Not Reported; NR			
Partition Coefficient Type and Partition Coefficient Results	Koc; 1375			
Partition Coefficient Phase and Partition Coefficient Results	NR; Not Reported			
Mass Balance	NR			
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	Medium	The test substance source and purity were not reported; more details may be in the source cited.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Concurrent study controls not reported; more details may be in the source cited.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; more details may be in the source cited.
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Study Citation:		ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.		
OECD Harmonized Template:		Adsorption and Desorption		
HERO ID:		5017839		
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Medium	No test method reported; more details may be in the source cited.
	Metric 6:	Testing Conditions	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 7:	Testing Consistency	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 8:	System Type and Design	Medium	System type and design were not reported; more details may be in the source cited.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type.
	Metric 10:	Sampling Methods	N/A	This metric does not apply to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome was reasonable; more details may be in the source cited.
	Metric 12:	Test Substance Purity	Medium	Sampling method not reported; more details may be in the source cited.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables not reported; more details may be in the source cited.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric does not apply to this study type; more details may be in the source cited.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Information regarding this metric was not reported; more details may be in the source cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Reported results appear reasonable; more details may be in the source cited.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.

Overall Quality Determination

Medium

* Related References: Cites secondary source Schwarzenbach and Westall 1981 (HERO ID 94446).

Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	5017839

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene
Confidentiality, Type, Guideline	no; experimental; other: not specified
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR
Sampling Frequency, Sampling Details, and Number of Replicates	NR; NR; NR
pH, Test Temperature, Buffer, and Test Details	7.45; NR; NR; NR
Matrix, Clay Silts and Organic Carbon, and CEC	other; 12.9% sand, 64.3% silt, 19.6% clay, 0.76% OC; Not Reported
Bulk Density and Matrix Details	Not Reported; Parabraun Soil
Media, Recovery, and Statistics	NR; NR; NR
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NR; NR; NR
Reference Substance, Reference Substance Results, and Percent Adsorption	NR; NR; Not Reported; 5.5
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Koc; 724
Partition Coefficient Type and Partition Coefficient Results	NR; NR
Partition Coefficient Phase and Partition Coefficient Results	NR
Mass Balance	

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	Medium	The test substance source and purity were not reported; more details may be in the source cited.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Concurrent study controls not reported; more details may be in the source cited.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; more details may be in the source cited.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	Medium	No test method reported; more details may be in the source cited.

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Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5017839			
Domain		Metric	EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 7:	Testing Consistency	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 8:	System Type and Design	Medium	System type and design were not reported; more details may be in the source cited.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type.
	Metric 10:	Sampling Methods	N/A	This metric does not apply to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome was reasonable; more details may be in the source cited.
	Metric 12:	Test Substance Purity	Medium	Sampling method not reported; more details may be in the source cited.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables not reported; more details may be in the source cited.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric does not apply to this study type; more details may be in the source cited.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Information regarding this metric was not reported; more details may be in the source cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Reported results appear reasonable; more details may be in the source cited.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.
Overall Quality Determination			Medium	

* Related References: Cites secondary source Frische R, Hachmann R and Rippen G (1981). Ermittlung und Bewertung der Umweltbelastung und -verteilung von Verbrauchskemikalien. Beispiel: p-Dichlorbenzol als Geruchuebertoeener im Sanitaerbereich. UFOPLAN des BMI, Forschungsbericht 105.05019/03 Entwurf 1981, im Auftrag des Umweltbundesamtes (Not in HERO at the time of extraction).

Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	5017839

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene
Confidentiality, Type, Guideline	no; experimental; other: not specified
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR
Sampling Frequency, Sampling Details, and Number of Replicates	NR; NR; NR
pH, Test Temperature, Buffer, and Test Details	3.88; NR; NR; NR
Matrix, Clay Silts and Organic Carbon, and CEC	Podzol; 81.5% sand, 10% silt, 7.2% clay, 3.56% OC; NR
Bulk Density and Matrix Details	NR; NR
Media, Recovery, and Statistics	NR; NR; NR
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NR; NR; NR
Reference Substance, Reference Substance Results, and Percent Adsorption	NR; NR; Not Reported; 26.5
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	NR; NR; Not Reported; 26.5
Partition Coefficient Type and Partition Coefficient Results	Koc; 744
Partition Coefficient Phase and Partition Coefficient Results	NR; NR
Mass Balance	NR

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	Medium	The test substance source and purity were not reported; more details may be in the source cited.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Concurrent study controls not reported; more details may be in the source cited.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; more details may be in the source cited.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	Medium	No test method reported; more details may be in the source cited.

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Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5017839			
Domain		Metric	EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 7:	Testing Consistency	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 8:	System Type and Design	Medium	System type and design were not reported; more details may be in the source cited.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type.
	Metric 10:	Sampling Methods	N/A	This metric does not apply to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome was reasonable; more details may be in the source cited.
	Metric 12:	Test Substance Purity	Medium	Sampling method not reported; more details may be in the source cited.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables not reported; more details may be in the source cited.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric does not apply to this study type; more details may be in the source cited.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Information regarding this metric was not reported; more details may be in the source cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Reported results appear reasonable; more details may be in the source cited.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.
Overall Quality Determination			Medium	

* Related References: Cites secondary source Frische R, Hachmann R and Rippen G (1981). Ermittlung und Bewertung der Umweltbelastung und -verteilung von Verbrauchskemikalien. Beispiel: p-Dichlorbenzol als Geruchuebertoner im Sanitaerbereich. UFOPLAN des BMI, Forschungsbericht 105.05019/03 Entwurf 1981, im Auftrag des Umweltbundesamtes (Not in HERO at the time of extraction).

Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5017839			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene			
Confidentiality, Type, Guideline	no; experimental; other: not specified			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR			
Sampling Frequency, Sampling Details, and Number of Replicates	NR; NR; NR			
pH, Test Temperature, Buffer, and Test Details	7.9; NR; NR; NR			
Matrix, Clay Silts and Organic Carbon, and CEC	other; 8.5% sand, 68.3% silt, 20.6% clay, 1.11% OC; NR			
Bulk Density and Matrix Details	NR; Rendzina soil			
Media, Recovery, and Statistics	NR; NR; NR			
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NR; NR; 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; Not Reported; 8.3			
Partition Coefficient Type and Partition Coefficient Results	Koc; 748			
Partition Coefficient Phase and Partition Coefficient Results	NR; NR			
Mass Balance	NR			
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	Medium	The test substance source and purity were not reported; more details may be in the source cited.	
Domain 2: Test Design	Metric 3: Study Controls	Medium	Concurrent study controls not reported; more details may be in the source cited.	
	Metric 4: Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; more details may be in the source cited.	
Domain 3: Test Conditions	Metric 5: Test Method Suitability	Medium	No test method reported; more details may be in the source cited.	
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Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5017839			
Domain		Metric	EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 7:	Testing Consistency	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 8:	System Type and Design	Medium	System type and design were not reported; more details may be in the source cited.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type.
	Metric 10:	Sampling Methods	N/A	This metric does not apply to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome was reasonable; more details may be in the source cited.
	Metric 12:	Test Substance Purity	Medium	Sampling method not reported; more details may be in the source cited.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables not reported; more details may be in the source cited.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric does not apply to this study type; more details may be in the source cited.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Information regarding this metric was not reported; more details may be in the source cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Reported results appear reasonable; more details may be in the source cited.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.
Overall Quality Determination			Medium	

* Related References: Cites secondary source Frische R, Hachmann R and Rippen G (1981). Ermittlung und Bewertung der Umweltbelastung und -verteilung von Verbrauchskemikalien. Beispiel: p-Dichlorbenzol als Geruchuebertoner im Sanitaerbereich. UFOPLAN des BMI, Forschungsbericht 105.05019/03 Entwurf 1981, im Auftrag des Umweltbundesamtes (Not in HERO at the time of extraction).

Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5017839			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene			
Confidentiality, Type, Guideline	no; experimental; other: not specified			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR			
Sampling Frequency, Sampling Details, and Number of Replicates	NR; NR; NR			
pH, Test Temperature, Buffer, and Test Details	NR; NR; NR; NR			
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 17% organic carbon; NR			
Bulk Density and Matrix Details	NR; peat soil			
Media, Recovery, and Statistics	NR; NR; NR			
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NR; NR; NR			
Reference Substance, Reference Substance Results, and Percent Adsorption	NR; NR; NR			
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption	NR; NR; Not Reported; 73.6-76			
Desorption Type	NR; NR; NR			
Partition Coefficient Type and Partition Coefficient Results	Koc; 423			
Partition Coefficient Phase and Partition Coefficient Results	NR; Saturation of absorption not obtained			
Mass Balance	NR			
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	Medium	The test substance source and purity were not reported; more details may be in the source cited.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Concurrent study controls not reported; more details may be in the source cited.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; more details may be in the source cited.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	Medium	No test method reported; more details may be in the source cited.
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Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5017839			
Domain		Metric	EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 7:	Testing Consistency	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 8:	System Type and Design	Medium	System type and design were not reported; more details may be in the source cited.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type.
	Metric 10:	Sampling Methods	N/A	This metric does not apply to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome was reasonable; more details may be in the source cited.
	Metric 12:	Test Substance Purity	Medium	Sampling method not reported; more details may be in the source cited.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables not reported; more details may be in the source cited.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric does not apply to this study type; more details may be in the source cited.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Information regarding this metric was not reported; more details may be in the source cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Reported results appear reasonable; more details may be in the source cited.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.
Overall Quality Determination			Medium	

* Related References: Cites secondary source Frische R, Hachmann R and Rippen G (1981). Ermittlung und Bewertung der Umweltbelastung und -verteilung von Verbrauchskemikalien. Beispiel: p-Dichlorbenzol als Geruchuebertoeener im Sanitaerbereich. UFOPLAN des BMI, Forschungsbericht 105.05019/03 Entwurf 1981, im Auftrag des Umweltbundesamtes (Not in HERO at the time of extraction).

Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	5017839

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene
Confidentiality, Type, Guideline	no; experimental; other: not specified
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR
Sampling Frequency, Sampling Details, and Number of Replicates	NR; NR; NR
pH, Test Temperature, Buffer, and Test Details	5.3; NR; NR; NR
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 0.024% organic carbon; NR
Bulk Density and Matrix Details	NR; Aquifer
Media, Recovery, and Statistics	NR; NR; NR
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NR; NR; NR
Reference Substance, Reference Substance Results, and Percent Adsorption	NR; NR; Not Reported; NR
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Koc; 595
Partition Coefficient Type and Partition Coefficient Results	NR; Not Reported
Partition Coefficient Phase and Partition Coefficient Results	NR
Mass Balance	

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	Medium	The test substance source and purity were not reported; more details may be in the source cited.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Concurrent study controls not reported; more details may be in the source cited.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; more details may be in the source cited.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	Medium	No test method reported; more details may be in the source cited.

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Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5017839			
Domain		Metric	EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 7:	Testing Consistency	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 8:	System Type and Design	Medium	System type and design were not reported; more details may be in the source cited.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type.
	Metric 10:	Sampling Methods	N/A	This metric does not apply to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome was reasonable; more details may be in the source cited.
	Metric 12:	Test Substance Purity	Medium	Sampling method not reported; more details may be in the source cited.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables not reported; more details may be in the source cited.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric does not apply to this study type; more details may be in the source cited.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Information regarding this metric was not reported; more details may be in the source cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Reported results appear reasonable; more details may be in the source cited.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.
Overall Quality Determination			Medium	

* Related References: Cites secondary source Miller et al 1989 (HERO ID 8755436).

Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5017839			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene			
Confidentiality, Type, Guideline	no; experimental; other: not specified			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR			
Sampling Frequency, Sampling Details, and Number of Replicates	NR; NR; NR			
pH, Test Temperature, Buffer, and Test Details	NR; NR; NR; NR			
Matrix, Clay Silts and Organic Carbon, and CEC	other; 0.73% organic carbon; NR			
Bulk Density and Matrix Details	NR; Sediment ($\varnothing < 125 \mu\text{m}$)			
Media, Recovery, and Statistics	NR; NR; NR			
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NR; NR; 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; Not Reported; NR			
Partition Coefficient Type and Partition Coefficient Results	Koc; 602			
Partition Coefficient Phase and Partition Coefficient Results	NR; Not Reported			
Mass Balance	NR			
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	Medium	The test substance source and purity were not reported; more details may be in the source cited.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Concurrent study controls not reported; more details may be in the source cited.
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, preparation or storage conditions were not reported; more details may be in the source cited.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	Medium	No test method reported; more details may be in the source cited.
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Study Citation:	ECHA, (2004). European Union risk assessment report: 1,4-dichlorobenzene.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5017839			
Domain		Metric	EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 7:	Testing Consistency	Medium	No test conditions were reported; more details may be in the source cited.
	Metric 8:	System Type and Design	Medium	System type and design were not reported; more details may be in the source cited.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type.
	Metric 10:	Sampling Methods	N/A	This metric does not apply to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	The outcome was reasonable; more details may be in the source cited.
	Metric 12:	Test Substance Purity	Medium	Sampling method not reported; more details may be in the source cited.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Confounding variables not reported; more details may be in the source cited.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric does not apply to this study type; more details may be in the source cited.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Medium	Information regarding this metric was not reported; more details may be in the source cited.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	This metric does not apply to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Reported results appear reasonable; more details may be in the source cited.
	Metric 18:	QSAR Models	N/A	A QSAR model was not reported.
Overall Quality Determination			Medium	

* Related References: Cites secondary source Schwarzenbach and Westall 1981 (HERO ID 94446).

Study Citation:	Gao, C., Govind, R., Tabak, H. H. (1996). Predicting soil sorption coefficients of organic chemicals using a neural network model. Environmental Toxicology and Chemistry 15(7):1089-1096.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	659993

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; Not Reported
Confidentiality, Type, Guideline	None; QSAR; other
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; NR; NR; NR
Sampling Frequency, Sampling Details, and Number of Replicates	Not applicable; Not applicable; Not applicable
pH, Test Temperature, Buffer, and Test Details	Not applicable; Not applicable; Not applicable; 119 compounds in training set; log Kow used for 1,4-dichlorobenzene 3.39; log solubility used for 1,4-dichlorobenzene 1.90
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; Not applicable; Not applicable
Bulk Density and Matrix Details	Not applicable; Not applicable
Media, Recovery, and Statistics	Not applicable; Not applicable; sum of square residuals for linear regression for 119 training set using log Kow (53.52); linear regression using log solubility (55.26); using both log Kow and log solubility (40.37); using neural network model (35.61); for 14 test set sum of square residuals for linear regression using log Kow (11.97); linear regression using log solubility (6.091); using both log Kow and log solubility (8.034); using neural network model (1.459)
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not applicable; Not applicable; Not applicable
Reference Substance, Reference Substance Results, and Percent Adsorption	Not applicable; Not applicable; Not applicable
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Not applicable; Not applicable; Not applicable; Not applicable
Partition Coefficient Type and Partition Coefficient Results	log Koc; 2.59; 3.31; 2.73; 2.96; 2.66
Partition Coefficient Phase and Partition Coefficient Results	experimental; linear regression using log Kow; linear regression using log solubility; using both log Kow and log solubility; using neural network model; Not Reported
Mass Balance	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	N/A	The metric is not applicable to the study type.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	The metric is not applicable to the study type.

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Study Citation:	Gao, C., Govind, R., Tabak, H. H. (1996). Predicting soil sorption coefficients of organic chemicals using a neural network model. Environmental Toxicology and Chemistry 15(7):1089-1096.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	659993			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to the study type.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	N/A	The metric is not applicable to the study type.
	Metric 7:	Testing Consistency	High	Testing was consistent.
	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	N/A	The metric is not applicable to the study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to the study type.
	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 data reporting was acceptable.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	kinetic calculations were not clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results were reasonable.
	Metric 18:	QSAR Models	Medium	The model is non-transparent and difficult to reproduce methods were used to build the (Q)SAR model.
Overall Quality Determination		High		

Study Citation:	Kan, A. T., Fu, G., Tomson, M. B. (1994). Adsorption/desorption hysteresis in organic pollutant and soil/sediment interaction. Environmental Science & Technology 28(5):859-867.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1482496			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	Not Reported; p-dichlorobenzene			
Confidentiality, Type, Guideline	None; experimental; other: Adsorption and desorption of pollutants to soil and sediment			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	None; 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; room temperature; not reported; not reported			
Matrix, Clay Silts and Organic Carbon, and CEC	other; 2% clay/6% silt/92% sand; 0.17-0.75% OC; not reported			
Bulk Density and Matrix Details	not reported; BET surface area 1.24 m2/g			
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	not reported; not reported; not reported; not reported			
Partition Coefficient Type and Partition Coefficient Results	not reported; results were not given/shown			
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 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:	Kan, A. T., Fu, G., Tomson, M. B. (1994). Adsorption/desorption hysteresis in organic pollutant and soil/sediment interaction. Environmental Science & Technology 28(5):859-867.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1482496			
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	Uninformative	Testing conditions were not reported.
	Metric 7:	Testing Consistency	N/A	Testing consistencies were not reported.
	Metric 8:	System Type and Design	Uninformative	Equilibrium was not reported.
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	N/A	No outcome was reported.
	Metric 12:	Test Substance Purity	Low	Details regarding sampling methods of the outcomes were not fully reported, and the omissions were likely to have a substantial impact on study results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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	Uninformative	No data was reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	No data was reported.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	N/A	There were no results for dichlorobenzenes reported.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			Uninformative	

Study Citation:	Kleineidam, S., Schuth, C., Grathwohl, P. (2002). Solubility-normalized combined adsorption-partitioning sorption isotherms for organic pollutants. Environmental Science & Technology 36(21):4689-4697.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	1962773

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; other: Sorption isotherms determined using batch experiments
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Aldrich Chemical Corp.; NR; NR Notes: 1,4-DCB; used as received
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; supernatant filtered and extracted with cyclohexane and analyzed; 3
pH, Test Temperature, Buffer, and Test Details	Not reported; 20C; Not reported; Batch experiments run in crimp-top glass reaction vials sealed with PTFE-lined butyl rubber septa with 0.005-5 g pulverized sample; shaken by hand daily for 7 days, stored in the dark
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 33.4% OC; Not reported
Bulk Density and Matrix Details	specific surface area: 1.20 m2/g; Peat
Media, Recovery, and Statistics	filter sterilized water; Not reported; r squared = 0.99
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not reported; 7 days was found to be sufficient for equilibrium to establish; Not reported
Reference Substance, Reference Substance Results, and Percent Adsorption	Reference vials containing no solids were prepared and treated identically.; Not reported; Not reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Kd: distribution coefficient at 0.1 S (L/kg); 104; 115 (Based on Subcooled Liquid Solubility); Not reported; log Kfr = 2.25±0.08; log K*fr = 3.86 (solubility normalized Freundlich coefficient based on Subcooled Liquid Solubility) log K*fr = 3.70 (solubility normalized Freundlich coefficient based on Solids Solubility)
Partition Coefficient Type and Partition Coefficient Results	log Koc solubility normalized organic carbon normalized partitioning coefficient; Raoult's Law Kp: partitioning coefficient (L/kg); log Koc = 4.33 (Based on Subcooled Liquid Solubility); log Koc = 4.57 (Based on Solids Solubility); Kp = 108
Partition Coefficient Phase and Partition Coefficient Results	soil-water; Calculated using equation: log Koc = log K*Fr - log(oc/100)
Mass Balance	Not reported

EVALUATION				
Domain	Metric		Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High	The test substance was identified clearly.
	Metric 2:	Test Substance Purity	Medium	Source was reported, purity was not specified.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were reported; results not reported.
	Metric 4:	Test Substance Stability	High	The test substance preparation was reported.

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Study Citation:	Kleineidam, S., Schuth, C., Grathwohl, P. (2002). Solubility-normalized combined adsorption-partitioning sorption isotherms for organic pollutants. Environmental Science & Technology 36(21):4689-4697.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1962773			
Domain		Metric	EVALUATION Rating	Comments
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable.
	Metric 6:	Testing Conditions	Medium	Some test condition details were omitted.
	Metric 7:	Testing Consistency	High	Testing was consistent.
	Metric 8:	System Type and Design	High	Equilibrium was established.
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	This metric is not applicable to this type of study.
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	Limited details regarding this metric.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	No confounding variables were identified.
	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	Some analytical details including recovery and detection limits were omitted.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Limited details regarding this metric.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			Medium	

Study Citation:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4912216

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	Deionized water; NR; NR; NR
Radiolabel, Source, State, Purity	Uniformly labeled [¹⁴ C], 19.99 mCi/mmol; Sigma Chemical, St. Louis, MO, USA; Liquid; >95% (radiochemical purity); 99.5% (nonradiolabeled purity) Notes: Mixture of radiolabeled and non-radiolabeled compound in deionized water
Sampling Frequency, Sampling Details, and Number of Replicates	2, 7, and 31 d; Tubes centrifuged at 3000 g for 30 min; Not reported
pH, Test Temperature, Buffer, and Test Details	Not reported; 23°C; Not reported; 0.8 g dry wt. autoclaved soil placed in Teflon centrifuge tubes and spiked with 1, 2, and 5 mg/L test substance and aqueous solution, capped with Teflon-lined screw caps
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 27.6% organic carbon; Not reported
Bulk Density and Matrix Details	Not reported; Surface marsh soil (0 - 20 cm) collected from freshwater marsh in Madisonville, LA, USA
Media, Recovery, and Statistics	Aqueous solution of CaCl ₂ , NaHCO ₃ , MgCl ₂ , and NaN ₂ ; Not reported; Linear and Freundlich fitting performed with Table curve Version 4, AISN Software, SPSS
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; Equilibrated by mixing in a rotary tumbler for 48 h; Removing and replacing 30 - 25 mL supernatant with electrolyte solution media and mixing in a rotary tumbler for 24 h
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; 796, 889, 1207 L/kg; Determined after 2, 7, and 31 d contact period; Log Kf = 2.17 - 2.48 (sorption, r ² = 0.90 - 0.99), 2.23 - 2.34 - 1.47 (desorption, r ² = 0.87 - 0.93)
Partition Coefficient Type and Partition Coefficient Results	Freundlich model, n = 0.75 - 0.95 (sorption), 0.49 - 0.63 (desorption) Increased over increasing contact times. 74% of sorbed 1,4-DCB desorbed after 2 d contact time, 65% after 7 d, and 45% after 31 d.; Hysteresis index: 0.40 - 0.42
Partition Coefficient Phase and Partition Coefficient Results	soil-water; 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 by name.
	Metric 2:	Test Substance Purity	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not explicitly included.

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Study Citation:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	4912216			
Domain		Metric	EVALUATION Rating	Comments
	Metric 4:	Test Substance Stability	High	Test substance solvent and applied concentrations were reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Limited testing conditions (temperature, soil organic carbon content) were reported.
	Metric 7:	Testing Consistency	High	Test method was applied consistently across study groups.
	Metric 8:	System Type and Design	High	The system was capable of maintaining test substance concentrations.
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	Sample methods addressed the outcomes of interest and used accepted approaches.
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	The analytical methods were appropriate, percent recovery and limits of detection were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Sorption calculations were described and applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results are reasonable based on the method however the study is low in detail and compared general trends only to previous studies.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4912216

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	Deionized water; NR; NR; NR
Radiolabel, Source, State, Purity	Uniformly labeled [¹⁴ C], 19.99 mCi/mmol; Sigma Chemical, St. Louis, MO, USA; Liquid; >95% (radiochemical purity); 99.5% (nonradiolabeled purity) Notes: Mixture of radiolabeled and non-radiolabeled compound in deionized water
Sampling Frequency, Sampling Details, and Number of Replicates	2, 7, and 31 d; Tubes centrifuged at 3000 g for 30 min; Not reported
pH, Test Temperature, Buffer, and Test Details	Not reported; 23°C; Not reported; 0.8 g dry wt. autoclaved soil placed in Teflon centrifuge tubes and spiked with 1, 2, and 5 mg/L test substance and aqueous solution, capped with Teflon-lined screw caps
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 23.1% organic carbon; Not reported
Bulk Density and Matrix Details	Not reported; Deep marsh soil (20 - 40 cm) collected from freshwater marsh in Madisonville, LA, USA
Media, Recovery, and Statistics	Aqueous solution of CaCl ₂ , NaHCO ₃ , MgCl ₂ , and NaN ₂ ; Not reported; Linear and Freundlich fitting performed with Table curve Version 4, AISN Software, SPSS
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; Equilibrated by mixing in a rotary tumbler for 48 h; Removing and replacing 30 - 25 mL supernatant with electrolyte solution media and mixing in a rotary tumbler for 24 h
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; 1463, 1565, 1998 L/kg; Determined after 2, 7, and 31 d contact period; Log Kf = 2.43 - 2.62 (sorption, r ² = 0.96 - 0.99), 2.34 - 2.36 (desorption, r ² = 0.97 - 0.98)
Partition Coefficient Type and Partition Coefficient Results	Freundlich model, n = 0.82 - 0.94 (sorption), 0.46 - 0.69 (desorption) Increased over increasing contact times. 50% of sorbed 1,4-DCB desorbed after 2 d contact time, 50% after 7 d, and 33% after 31 d.; Hysteresis index: 0.11 - 0.18
Partition Coefficient Phase and Partition Coefficient Results	soil-water; 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 by name.
	Metric 2:	Test Substance Purity	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	High	Test substance solvent and applied concentrations were reported.
Domain 3: Test Conditions				

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Study Citation:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	4912216			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Limited testing conditions (temperature, soil organic carbon content) were reported.
	Metric 7:	Testing Consistency	High	Test method was applied consistently across study groups.
	Metric 8:	System Type and Design	High	The system was capable of maintaining test substance concentrations.
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	Sample methods addressed the outcomes of interest and used accepted approaches.
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	The analytical methods were appropriate, percent recovery and limits of detection were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Sorption calculations were described and applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results are reasonable based on the method however the study is low in detail and compared general trends only to previous studies.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4912216

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	Deionized water; NR; NR; NR
Radiolabel, Source, State, Purity	Uniformly labeled [¹⁴ C], 19.99 mCi/mmol; Sigma Chemical, St. Louis, MO, USA; Liquid; >95% (radiochemical purity); 99.5% (nonradiolabeled purity) Notes: Mixture of radiolabeled and non-radiolabeled compound in deionized water
Sampling Frequency, Sampling Details, and Number of Replicates	2, 7, and 31 d; Tubes centrifuged at 3000 g for 30 min; Not reported
pH, Test Temperature, Buffer, and Test Details	Not reported; 23°C; Not reported; 5 g dried autoclaved soil placed in Teflon centrifuge tubes and spiked with 1, 2, and 5 mg/L test substance and aqueous solution, capped with Teflon-lined screw caps
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 1.4% organic carbon; Not reported
Bulk Density and Matrix Details	Not reported; PPI soil (0 - 20 cm) collected from bottomland hardwood swamp next to the Brooklawn site
Media, Recovery, and Statistics	Aqueous solution of CaCl ₂ , NaHCO ₃ , MgCl ₂ , and Na ₂ SO ₄ ; Not reported; Linear and Freundlich fitting performed with Table curve Version 4, AISN Software, SPSS
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; Equilibrated by mixing in a rotary tumbler for 48 h; Removing and replacing 30 - 25 mL supernatant with electrolyte solution media and mixing in a rotary tumbler for 24 h
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	K _{oc} : 981, 1487, 2,887 L/kg; Determined after 2, 7, and 31 d contact period; Log K _f = 1.00 - 1.43 (sorption, r ² = 0.99), 1.16 - 1.47 (desorption, r ² = 0.90 - 0.98)
Partition Coefficient Type and Partition Coefficient Results	Freundlich model, n = 0.80 - 0.76 (sorption), 0.21 - 0.39 (desorption) Increased over increasing contact times. 71% of sorbed 1,4-DCB desorbed after 2 d contact time, 55% after 7 d, and 40% after 31 d.; Hysteresis index: 1.72 - 2.26
Partition Coefficient Phase and Partition Coefficient Results	soil-water; 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 by name.
	Metric 2:	Test Substance Purity	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	High	Test substance solvent and applied concentrations were reported.
Domain 3: Test Conditions				

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Study Citation:	Lee, S., Pardue, J. H., Moe, W. M., Valsaraj, K. T. (2003). Mineralization of desorption-resistant 1,4-dichlorobenzene in wetland soils. Environmental Toxicology and Chemistry 22(10):2312-2322.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	4912216			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6:	Testing Conditions	Medium	Limited testing conditions (temperature, soil organic carbon content) were reported.
	Metric 7:	Testing Consistency	High	Test method was applied consistently across study groups.
	Metric 8:	System Type and Design	High	The system was capable of maintaining test substance concentrations.
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	Sample methods addressed the outcomes of interest and used accepted approaches.
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	The analytical methods were appropriate, percent recovery and limits of detection were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Sorption calculations were described and applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results are reasonable based on the method however the study is low in detail and compared general trends only to previous studies.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	Oliver, B. G. (1987). Fate of some chlorobenzenes from the Niagara River in Lake Ontario USA Canada. Advances in Chemistry 216(0):471-489.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1992098			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
Confidentiality, Type, Guideline	None; Experimental; other: Not reported; Field study in pollution plume in Lake Ontario to determine water-suspended sediment partitioning			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; Water samples from pollution plume in Lake Ontario; Nr; NR			
Sampling Frequency, Sampling Details, and Number of Replicates	September 22, 1984; Water collected at 1 m depth as 200 L samples over 24 hr; Not reported			
pH, Test Temperature, Buffer, and Test Details	Not reported; Not reported; NA; Field study in pollution plume in Lake Ontario			
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 6.6% organic carbon content; Not reported			
Bulk Density and Matrix Details	Not reported; 3 mg/L suspended sediment			
Media, Recovery, and Statistics	Lake Ontario water; Not reported; Not reported			
Transformation Products, Equilibrium	Not Reported; Not Reported; Not Reported			
Adsorption Details, and Equilibrium Desorption Details				
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 Koc; 5.5; Range: log Koc = 5.3 - 5.6Calculated log Koc = 3.0Calculated from Koc = 0.411*Kow where log Kow = 3.4; Not Reported			
Partition Coefficient Type and Partition Coefficient Results	Not Reported; Not Reported			
Partition Coefficient Phase and Partition Coefficient Results	suspended matter-water; Not Reported			
Mass Balance	Not Reported			
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	Medium	Sample source was reported generally.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Field blanks or analytical controls were not explicitly included.
	Metric 4:	Test Substance Stability	Medium	Sample storage was not reported.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	High	The field study method was appropriate for the test substance.

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Study Citation:	Oliver, B. G. (1987). Fate of some chlorobenzenes from the Niagara River in Lake Ontario USA Canada. Advances in Chemistry 216(0):471-489.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1992098			
Domain		Metric	EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Medium	Minimal sample characteristics or environmental conditions were reported.
	Metric 7:	Testing Consistency	High	Sample collection was consistent across sample groups.
	Metric 8:	System Type and Design	High	Field studies are assumed to be in dynamic equilibrium.
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 partition coefficients.
	Metric 12:	Test Substance Purity	Medium	Sampling methods were appropriate, samples were collected once. The number of sites sampled was not reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Very few study methods provided, mostly results interpretation. Analytical issues may have caused the value to not agree with log Kow.
	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	The analytical method was not reported, raw data was 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	Uninformative	No study details were included to support this value, and the authors note that the value does not support known relationships to log Kow, possibly due to analytical issues.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination

Uninformative

Study Citation:	Oman, C., Spannar, C. (1999). Sorption of organic compounds to solid waste. Waste Management & Research 17(4):275-287.		
OECD Harmonized Template:	Adsorption and Desorption		
HERO ID:	4933205		
EXTRACTION			
Parameter	Data		
CASRN and Test Material	106-46-7; 1,4-DCB		
Confidentiality, Type, Guideline	None; Experimental; other: Not reported; sorption to solid waste collected from a municipal landfill		
Solvent, Reactivity, Storage, Stability	Methanol; NR; NR; NR		
Radiolabel, Source, State, Purity	NA; Merck, Schuchardt, Germany; NR; Analytical quality Notes: Diluted with water to prepare test concentrations; solutions above 1/10th water solubility were mixed for 24 hr before use		
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Volatiles from aqueous solution purged and trapped for analysis; 3		
pH, Test Temperature, Buffer, and Test Details	7.0 - 7.1; 20°C; Sodium hydrogen phosphate and sodium dihydrogen phosphate; Automated apparatus with test substance dispensing vessel connected to the reactor, which was connected to the purge and trap concentrator coupled to a GC-FID; liquid to solid ratio 200:1		
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 29.3% organic carbon; Not reported		
Bulk Density and Matrix Details	Not reported; Landfill material, highly degraded, 20% thin and soft plastics, 19% rubber, 59% wooden sticks		
Media, Recovery, and Statistics	Water; Not reported; Linear isotherm, RSD between Kp values 18%		
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; Equilibrium reached at 170 h; 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	Linear sorption isotherm; 410 mL/g		
Partition Coefficient Phase and Partition Coefficient Results	other; Concentration: 10 - 84, R^2 = 0.96, n= 9, no correlation with TOC observed for studied solid waste groups, possibly due to small variations		
Mass Balance	Not reported		
EVALUATION			
Domain	Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	High	The test substance was identified by name.
	Metric 2:	Medium	The tests substance source was reported, only qualitative purity reported.
Domain 2: Test Design	Metric 3:	Medium	Controls were not explicitly included.
	Metric 4:	High	The test substance preparation was reported and appropriate.
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Study Citation:		Oman, C., Spannar, C. (1999). Sorption of organic compounds to solid waste. Waste Management & Research 17(4):275-287.		
OECD Harmonized Template:		Adsorption and Desorption		
HERO ID:		4933205		
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	Appropriate testing conditions (temperature, pH, TOC) 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 system was capable of maintaining test substance concentrations.
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 able to determine partition coefficients.
	Metric 12:	Test Substance Purity	High	Purge and trap sampling methods were acceptable addressed the outcomes of interest.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability in partition coefficient values was accounted for by the RSD and goodness of fit of the linear isotherms addressed was addressed by R ² values.
	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 analytical method and limit of detection was reported, percent recovery and mass balance were not reported. TOC normalized partition values were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Data were analyzed appropriately with linear isotherms.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable based on the method and comparable to previous studies. Relationship with TOC not observed likely to low variation of TOC in the studied land-fill materials.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	Oman, C., Spannar, C. (1999). Sorption of organic compounds to solid waste. Waste Management & Research 17(4):275-287.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4933205

EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
Confidentiality, Type, Guideline	None; Experimental; other: Not reported; sorption to solid waste collected from a municipal landfill			
Solvent, Reactivity, Storage, Stability	Methanol; NR; NR; NR			
Radiolabel, Source, State, Purity	NA; Merck, Schuchardt, Germany; NR; Analytical quality Notes: Diluted with water to prepare test concentrations; solutions above 1/10th water solubility were mixed for 24 hr before use			
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Volatiles from aqueous solution purged and trapped for analysis; 3			
pH, Test Temperature, Buffer, and Test Details	7.0 - 7.1; 20°C; Sodium hydrogen phosphate and sodium dihydrogen phosphate; Automated apparatus with test substance dispensing vessel connected to the reactor, which was connected to the purge and trap concentrator coupled to a GC-FID; liquid to solid ratio 200:1			
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 29.3% organic carbon; Not reported			
Bulk Density and Matrix Details	Not reported; Landfill material, highly degraded, 20% thin and soft plastics, 19% rubber, 59% wooden sticks			
Media, Recovery, and Statistics	Water; Not reported; Linear isotherm, RSD between Kp values 18%			
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; Equilibrium reached at 170 h; 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	Linear sorption isotherm; 860 mL/g			
Partition Coefficient Phase and Partition Coefficient Results	other; Concentration: 16 - 132, R^2 = 0.99, n= 8, no correlation with TOC observed for studied solid waste groups, possibly due to small variations			
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	Medium	The tests substance source was reported, only qualitative purity reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	High	The test substance preparation was reported and appropriate.
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:	Oman, C., Spannar, C. (1999). Sorption of organic compounds to solid waste. Waste Management & Research 17(4):275-287.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	4933205			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 6:	Testing Conditions	High	Appropriate testing conditions (temperature, pH, TOC) 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 system was capable of maintaining test substance concentrations.
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 able to determine partition coefficients.
	Metric 12:	Test Substance Purity	High	Purge and trap sampling methods were acceptable addressed the outcomes of interest.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability in partition coefficient values was accounted for by the RSD and goodness of fit of the linear isotherms addressed was addressed by R ² values.
	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 analytical method and limit of detection was reported, percent recovery and mass balance were not reported. TOC normalized partition values were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Data were analyzed appropriately with linear isotherms.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable based on the method and comparable to previous studies. Relationship with TOC not observed likely to low variation of TOC in the studied land-fill materials.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

Study Citation:	Oman, C., Spannar, C. (1999). Sorption of organic compounds to solid waste. Waste Management & Research 17(4):275-287.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4933205

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Not reported; sorption to solid waste collected from a municipal landfill
Solvent, Reactivity, Storage, Stability	Methanol; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Merck, Schuchardt, Germany; NR; Analytical quality Notes: Diluted with water to prepare test concentrations; solutions above 1/10th water solubility were mixed for 24 hr before use
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Volatiles from aqueous solution purged and trapped for analysis; 3
pH, Test Temperature, Buffer, and Test Details	7.0 - 7.1; 20°C; Sodium hydrogen phosphate and sodium dihydrogen phosphate; Automated apparatus with test substance dispensing vessel connected to the reactor, which was connected to the purge and trap concentrator coupled to a GC-FID; liquid to solid ratio 200:1
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 29.3% organic carbon; Not reported
Bulk Density and Matrix Details	Not reported; Landfill material, highly degraded, 20% thin and soft plastics, 19% rubber, 59% wooden sticks
Media, Recovery, and Statistics	Water; Not reported; Linear isotherm, RSD between Kp values 18%
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; Equilibrium reached at 170 h; 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	Linear sorption isotherm; 346 mL/g
Partition Coefficient Phase and Partition Coefficient Results	other; Concentration: 0.8 - 84, RSD 17%, no correlation with TOC observed for studied solid waste groups, possibly due to small variations
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	Medium	The tests substance source was reported, only qualitative purity reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	High	The test substance preparation was reported and appropriate.
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:		Oman, C., Spannar, C. (1999). Sorption of organic compounds to solid waste. Waste Management & Research 17(4):275-287.		
OECD Harmonized Template:		Adsorption and Desorption		
HERO ID:		4933205		
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 6:	Testing Conditions	High	Appropriate testing conditions (temperature, pH, TOC) 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 system was capable of maintaining test substance concentrations.
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 able to determine partition coefficients.
	Metric 12:	Test Substance Purity	High	Purge and trap sampling methods were acceptable addressed the outcomes of interest.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability in partition coefficient values was accounted for by the RSD and goodness of fit of the linear isotherms addressed was addressed by R ² values.
	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 analytical method and limit of detection was reported, percent recovery and mass balance were not reported. TOC normalized partition values were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Data were analyzed appropriately with linear isotherms.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable based on the method and comparable to previous studies. Relationship with TOC not observed likely to low variation of TOC in the studied land-fill materials.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

Study Citation:	Oman, C., Spannar, C. (1999). Sorption of organic compounds to solid waste. Waste Management & Research 17(4):275-287.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4933205

Parameter		EXTRACTION		
CASRN and Test Material		106-46-7; 1,4-DCB		
Confidentiality, Type, Guideline		None; Experimental; other: Not reported; sorption to solid waste collected from a municipal landfill		
Solvent, Reactivity, Storage, Stability		Methanol; NR; NR; NR		
Radiolabel, Source, State, Purity		NA; Merck, Schuchardt, Germany; NR; Analytical quality Notes: Diluted with water to prepare test concentrations; solutions above 1/10th water solubility were mixed for 24 hr before use		
Sampling Frequency, Sampling Details, and Number of Replicates		Not reported; Volatiles from aqueous solution purged and trapped for analysis; 3		
pH, Test Temperature, Buffer, and Test Details		7.0 - 7.1; 20°C; Sodium hydrogen phosphate and sodium dihydrogen phosphate; Automated apparatus with test substance dispensing vessel connected to the reactor, which was connected to the purge and trap concentrator coupled to a GC-FID; liquid to solid ratio 200:1		
Matrix, Clay Silts and Organic Carbon, and CEC		Not Reported; 29.3% organic carbon; Not reported		
Bulk Density and Matrix Details		Not reported; Landfill material, highly degraded, 20% thin and soft plastics, 19% rubber, 59% wooden sticks		
Media, Recovery, and Statistics		Water; Not reported; Linear isotherm, RSD between Kp values 18%		
Transformation Products, Equilibrium		NA; Equilibrium reached at 170 h; Not reported		
Adsorption Details, and Equilibrium Desorption Details				
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		Not Reported; Not Reported; Not Reported; Not Reported		
Desorption Type				
Partition Coefficient Type and Partition Coefficient Results		Linear sorption isotherm; 266 mL/g		
Partition Coefficient Phase and Partition Coefficient Results		other; Concentration: 0.8 - 8, R ² = 0.95, n= 13, no correlation with TOC observed for studied solid waste groups, possibly due to small variations		
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	Medium	The tests substance source was reported, only qualitative purity reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	High	The test substance preparation was reported and appropriate.
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:		Oman, C., Spannar, C. (1999). Sorption of organic compounds to solid waste. Waste Management & Research 17(4):275-287.		
OECD Harmonized Template:		Adsorption and Desorption		
HERO ID:		4933205		
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 6:	Testing Conditions	High	Appropriate testing conditions (temperature, pH, TOC) 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 system was capable of maintaining test substance concentrations.
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 able to determine partition coefficients.
	Metric 12:	Test Substance Purity	High	Purge and trap sampling methods were acceptable addressed the outcomes of interest.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability in partition coefficient values was accounted for by the RSD and goodness of fit of the linear isotherms addressed was addressed by R ² values.
	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 analytical method and limit of detection was reported, percent recovery and mass balance were not reported. TOC normalized partition values were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Data were analyzed appropriately with linear isotherms.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable based on the method and comparable to previous studies. Relationship with TOC not observed likely to low variation of TOC in the studied land-fill materials.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

Study Citation:	Oman, C., Spannar, C. (1999). Sorption of organic compounds to solid waste. Waste Management & Research 17(4):275-287.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4933205

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Not reported; sorption to solid waste collected from a municipal landfill
Solvent, Reactivity, Storage, Stability	Methanol; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Merck, Schuchardt, Germany; NR; Analytical quality Notes: Diluted with water to prepare test concentrations; solutions above 1/10th water solubility were mixed for 24 hr before use
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Volatiles from aqueous solution purged and trapped for analysis; 3
pH, Test Temperature, Buffer, and Test Details	7.0 - 7.1; 20°C; Sodium hydrogen phosphate and sodium dihydrogen phosphate; Automated apparatus with test substance dispensing vessel connected to the reactor, which was connected to the purge and trap concentrator coupled to a GC-FID; liquid to solid ratio 200:1
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 29.3% organic carbon; Not reported
Bulk Density and Matrix Details	Not reported; Landfill material, highly degraded, 20% thin and soft plastics, 19% rubber, 59% wooden sticks
Media, Recovery, and Statistics	Water; Not reported; Linear isotherm, RSD between Kp values 18%
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; Equilibrium reached at 170 h; 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	Linear sorption isotherm; 361 mL/g
Partition Coefficient Phase and Partition Coefficient Results	other; Concentration: 7 - 74, R^2 = 0.92, n= 15, no correlation with TOC observed for studied solid waste groups, possibly due to small variations
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	Medium	The tests substance source was reported, only qualitative purity reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	High	The test substance preparation was reported and appropriate.
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:	Oman, C., Spannar, C. (1999). Sorption of organic compounds to solid waste. Waste Management & Research 17(4):275-287.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	4933205			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 6:	Testing Conditions	High	Appropriate testing conditions (temperature, pH, TOC) 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 system was capable of maintaining test substance concentrations.
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 able to determine partition coefficients.
	Metric 12:	Test Substance Purity	High	Purge and trap sampling methods were acceptable addressed the outcomes of interest.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability in partition coefficient values was accounted for by the RSD and goodness of fit of the linear isotherms addressed was addressed by R ² values.
	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 analytical method and limit of detection was reported, percent recovery and mass balance were not reported. TOC normalized partition values were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Data were analyzed appropriately with linear isotherms.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The results were reasonable based on the method and comparable to previous studies. Relationship with TOC not observed likely to low variation of TOC in the studied land-fill materials.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination		High		

Study Citation:	Poole, S. K., Poole, C. F. (1996). Model for the sorption of organic compounds by soil from water. Analytical Communications 33(12):417-419.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	1486725

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	none; not specified; other: Non-guideline: model estimation for sorption to soil from water
Solvent, Reactivity, Storage, Stability	Not Reported; Not Reported; Not Reported; Not Reported
Radiolabel, Source, State, Purity	Not Reported; Not Reported; Not Reported; Not Reported
Sampling Frequency, Sampling Details, and Number of Replicates	NA; Not Reported; Not Reported
pH, Test Temperature, Buffer, and Test Details	Not Reported; Not Reported; Not Reported; solvation parameter model; Koc: soil-water sorption coefficient (organic carbon basis)
Matrix, Clay Silts and Organic Carbon, and CEC	other; 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	Not Reported; Not Reported; Not Reported
Adsorption Details, and Equilibrium Desorption Details	
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	Not Reported; Not Reported; Not Reported; Not Reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	log Koc; 2.44
Partition Coefficient Phase and Partition Coefficient Results	soil-water; value taken from the literature to define a model for the estimation of log Koc
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	The metric is not applicable.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The metric is not applicable.
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	N/A	The metric is not applicable.

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Study Citation:	Poole, S. K., Poole, C. F. (1996). Model for the sorption of organic compounds by soil from water. Analytical Communications 33(12):417-419.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1486725			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 6:	Testing Conditions	N/A	The metric is not applicable.
	Metric 7:	Testing Consistency	N/A	The metric is not applicable.
	Metric 8:	System Type and Design	N/A	The metric is not applicable.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	N/A	The metric is not applicable.
	Metric 12:	Test Substance Purity	N/A	The metric is not applicable.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	N/A	The metric is not applicable.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Calculations were described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Model results not reported for the target chemical; endpoint data is from cited source used to construct the model.
	Metric 18:	QSAR Models	Medium	Overall correlation coefficient = 0.982; Standard Error = 0.17

Overall Quality Determination**Low**

* Related References: Hong, H., Wang, L., Han, S., and Zou, G., Chemosphere, 1996, 32, 343. Prediction adsorption coefficients (KOC) for aromatic compounds by HPLC retention factors (K'). (HERO ID not found)

Study Citation:	Poole, S. K., Poole, C. F. (1999). Chromatographic models for the sorption of neutral organic compounds by soil from water and air. Journal of Chromatography A 845(1-2):381-400.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	645740

EXTRACTION

Parameter	Data
CASRN and Test Material	Not Reported; Not Reported
Confidentiality, Type, Guideline	None; Calculation; other: chromatographic model for sorption and partitioning
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; NR; NR; NR
Sampling Frequency, Sampling Details, and Number of Replicates	Not applicable; Not applicable; Not applicable
pH, Test Temperature, Buffer, and Test Details	Not applicable; Not applicable; Not applicable; 138 compounds were used in soil-water model; 69 compounds were used in soil-air model; using up to 6 descriptors; characteristic volume (0.961 cm ³ /mol/100), excess molar refraction (0.872 cm ³ /10), solute's dipolarity/polarizability (0.78), solute's hydrogen-bond basicity (0.04), distribution constant between gas and n-hexadecane @ 298 K (4.518)
Matrix, Clay Silts and Organic Carbon, and CEC	other; Not applicable; Not applicable
Bulk Density and Matrix Details	Not applicable; Not applicable
Media, Recovery, and Statistics	Not applicable; Not applicable; Summary of statistics for 138 compounds for soil-water: p=0.940, SE=0.391, F=202; for 69 compounds soil-air: p=0.991, SE=0.238, F=667
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not applicable; Not applicable; Not applicable
Reference Substance, Reference Substance Results, and Percent Adsorption	Not applicable; Not applicable; Not applicable
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Not applicable; Not applicable; Not applicable; Not applicable
Partition Coefficient Type and Partition Coefficient Results	Log K _{oc} ; Log K _{ow} ; Log K _{oc} a; 2.63; 3.44; 3.37
Partition Coefficient Phase and Partition Coefficient Results	soil-water (K _{oc}); octanol-water (K _{ow}); soil-air (K _{oc} a); Not Reported
Mass Balance	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	N/A	The metric is not applicable to this study type.
Domain 2: Test Design			
	Metric 3: Study Controls	N/A	The metric is not applicable to this study type.

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Study Citation:	Poole, S. K., Poole, C. F. (1999). Chromatographic models for the sorption of neutral organic compounds by soil from water and air. Journal of Chromatography A 845(1-2):381-400.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	645740			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	N/A	The metric is not applicable to this study type.
	Metric 6:	Testing Conditions	N/A	The metric is not applicable to this study type.
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this study type.
	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	N/A	The metric is not applicable to this study type.
	Metric 12:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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	This metric met the criteria for high confidence as expected for this type of study.
	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:	Prasad, S. S. (1992). Predicting the environmental distribution of compounds with unknown physicochemical properties from known pesticide properties. Journal of AOAC International 75(5):916-924.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	660424

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	none; calculation; other: not specified
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	other; 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	soil adsorption coefficient; 395; not reported; not reported
Desorption Type	
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	Medium	The test substance source was not reported in this secondary source.
Domain 2: Test Design	Metric 3:	Study Controls	Low	Controls were not reported in this secondary source.
	Metric 4:	Test Substance Stability	Low	Details were not reported in this secondary source.
Domain 3: Test Conditions				

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Study Citation:	Prasad, S. S. (1992). Predicting the environmental distribution of compounds with unknown physicochemical properties from known pesticide properties. Journal of AOAC International 75(5):916-924.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	660424			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 5:	Test Method Suitability	Low	Details were not reported in this secondary source.
	Metric 6:	Testing Conditions	Low	Details were not reported in this secondary source.
	Metric 7:	Testing Consistency	Low	Details were not reported in this secondary source.
	Metric 8:	System Type and Design	Low	Details were not reported in this secondary source.
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	Low	Details were not reported in this secondary source.
	Metric 12:	Test Substance Purity	Low	Details were not reported in this secondary source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Details were not reported in this 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	Details were not reported in this secondary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	Low	Details were not reported in this secondary source.
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	A QSAR model was not reported.

Overall Quality Determination**Low**

* Related References: HERO ID: 1265573 (not in distiller)Proceedings: International Conference on New Frontiers for Hazardous Waste Management (1985) Report Number 600985025

Study Citation:	Prytula, M. T., Pavlostathis, S. G. (1996). Effect of contaminant and organic matter bioavailability on the microbial dehalogenation of sediment-bound chlorobenzenes. Water Research 30(11):2669-2680.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	5237439

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Field study: sediment-water interface concentration measurements
Solvent, Reactivity, Storage, Stability	Sediment and water samples; NR; Stored in the dark at 4°C; NR
Radiolabel, Source, State, Purity	NA; Collected from an industrial canal and Bayou d'Inde; NR; NA
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Stainless steel Wildco Petite Ponar grab sampler; 3
pH, Test Temperature, Buffer, and Test Details	7.6±01 (water); 7±0.2 (sediment); 29°C; None; Test substance detected in water and sediment samples at 1 m depth
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; total organic carbon 4.8±0.3%; Not reported
Bulk Density and Matrix Details	Not reported; natural sediment - water samples collected from industrial canal and Bayou d'Inde
Media, Recovery, and Statistics	Not applicable; 1,3,5-tribromobenzene used as an internal standard: 95 - 105% recovery from sediment extraction; 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	Not Reported; Not Reported; Not Reported; Not Reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Sediment - water partition coefficient; 142
Partition Coefficient Phase and Partition Coefficient Results	sediment-water; Calculated by [sediment]/[water]
Mass Balance	Sediment: 9.5±0.5 mg/kg Water: 67.1±4.4 ug/L

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	High	The test substance source in the field studies detected was reported.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	Concurrent controls are not require for field studies
	Metric 4:	Test Substance Stability	High	Field sample preparation and storage conditions were reported and appropriate for the substance.

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Study Citation:	Prytula, M. T., Pavlostathis, S. G. (1996). Effect of contaminant and organic matter bioavailability on the microbial dehalogenation of sediment-bound chlorobenzenes. Water Research 30(11):2669-2680.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5237439			
Domain	Metric	EVALUATION		Comments
		Rating		
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 of the relevant test conditions were reported, however some sediment parameters (CEC) were omitted.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups and replicates.
	Metric 8:	System Type and Design	High	The study is a field study, which is assumed to be at equilibrium
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	Sample methods were appropriate and address the outcomes of interest
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability and uncertainty between replicates was accounted for
	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 were reported, analytical methods were suitable for detection and limits of detection were reported
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods used were appropriate.
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:	Sabljic, A. (1989). Quantitative modeling of soil sorption for xenobiotic chemicals. Environmental Health Perspectives 83(0):179-190.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1991093			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	Not Reported; 1,4-Dichlorobenzene			
Confidentiality, Type, Guideline	No; QSAR; other: Non-guideline: Quantitative Modeling of Soil Sorption			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: NR			
Sampling Frequency, Sampling Details, and Number of Replicates	NR; NR; NR			
pH, Test Temperature, Buffer, and Test Details	NR; NR; NR; Discussion on quantitative models for predicting soil sorption coefficients			
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; NR; NR			
Bulk Density and Matrix Details	NR; NR			
Media, Recovery, and Statistics	NR; NR; NR			
Transformation Products, Equilibrium	NR; NR; NR			
Adsorption Details, and Equilibrium Desorption Details				
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	NR; NR			
Partition Coefficient Phase and Partition Coefficient Results	NR; NR			
Mass Balance	NR			
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 is not applicable to this study type.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	This metric is not applicable to this study type.
	Metric 4:	Test Substance Stability	N/A	This metric is not applicable to this study type.
Domain 3: Test Conditions				
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Study Citation:	Sabljic, A. (1989). Quantitative modeling of soil sorption for xenobiotic chemicals. Environmental Health Perspectives 83(0):179-190.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1991093			
Domain	Metric	EVALUATION		Comments
		Rating		
	Metric 5:	Test Method Suitability	Uninformative	Secondary source: 'quantitative models for predicting soil sorption coefficients of xenobiotic chemicals will be described and evaluated'
	Metric 6:	Testing Conditions	N/A	This metric is not applicable to this study type.
	Metric 7:	Testing Consistency	N/A	This metric is not applicable to this study type.
	Metric 8:	System Type and Design	N/A	This metric is not applicable to this study type.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric is not applicable to this study type.
	Metric 10:	Sampling Methods	N/A	This metric is not applicable to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Uninformative	Secondary source for for modeling of soil sorption coefficients.
	Metric 12:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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	Uninformative	Secondary source; no results reported for target.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this study type.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Uninformative	No results reported for target.
	Metric 18:	QSAR Models	Uninformative	Secondary source for QSAR modeling.

Overall Quality Determination

Uninformative

Study Citation:	Sacan, M. T., Balcioglu, I. A. (1996). Prediction of the soil sorption coefficient of organic pollutants by the characteristic root index model. Chemosphere 32(10):1993-2001.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	1968187

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; QSAR; other: Sorption predictive model using quantitative structure-property relationships technique
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 applicable; Not applicable; Not applicable
pH, Test Temperature, Buffer, and Test Details	Not applicable; Not applicable; Not applicable; 36 chemicals were included in the data set; characteristic root index (CRI) model and regression of log Koc relationship represented by: $\log Koc = (\pm 0.034)1.034CRI = (\pm 0.113)0.441$
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; Not applicable; Not applicable
Bulk Density and Matrix Details	Not applicable; Not applicable
Media, Recovery, and Statistics	Not applicable; Not applicable; Summary statistics for correlation of experimental vs calculated log Koc of 36 compounds: $r = 0.982$, $r^2 = 0.964$, $s = 0.22$ and $F = 912$
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not applicable; Not applicable; Not applicable
Reference Substance, Reference Substance Results, and Percent Adsorption	Not applicable; Not applicable; Not applicable
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption	Not applicable; Not applicable; Not applicable; Not applicable
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	log Koc observed; log Koc predicted; 2.92; 2.79
Partition Coefficient Phase and Partition Coefficient Results	soil-water; CRI 2.2750
Mass Balance	Not applicable

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	N/A	The metric is not applicable to this study type.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The metric is not applicable to this study type.
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.

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Study Citation:	Sacan, M. T., Balcioglu, I. A. (1996). Prediction of the soil sorption coefficient of organic pollutants by the characteristic root index model. Chemosphere 32(10):1993-2001.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1968187			
EVALUATION				
Domain	Metric		Rating	Comments
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	N/A	The metric is not applicable to this study type.
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this study type.
	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	N/A	The metric is not applicable to this study type.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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	This metric met the criteria for high confidence as expected for this type of study.
	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	Medium	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:	Sander, M., Pignatello, J. J. (2009). Sorption irreversibility of 1,4-dichlorobenzene in two natural organic matter-rich geosorbents. Environmental Toxicology and Chemistry 28(3):447-457.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4912138

EXTRACTION

Parameter	Data
CASRN and Test Material	not reported; 1,4-dichlorobenzene
Confidentiality, Type, Guideline	No; experimental; other: sorption isotherm study
Solvent, Reactivity, Storage, Stability	methanol; NR; NR; NR
Radiolabel, Source, State, Purity	1,4-dichlorobenzene-[U- ¹⁴ C] (19.9 mCi/mmol; 99+% radiolabel purity); Sigma-Aldrich (St. Louis, MO, USA); solution; 99+% Notes: NR
Sampling Frequency, Sampling Details, and Number of Replicates	NR; Samples mixed end over end on a Rugged Rotator shaker and centrifuged prior to quantification. Quantification was performed by centrifugation where volumes of 0.5 to 1 ml of the supernatant was removed for analysis of radioactivity by liquid scintillation counting.; Experiments run in triplicate except for sorption-desorption batch equilibration was run in duplicate.
pH, Test Temperature, Buffer, and Test Details	NR; 20±1°C; NR; Glass flasks topped with polytetrafluoroethylene-lined Mininert valves mixed for 21 days; experiments conducted: 1- bulk sorption kinetics, followed uptake over time of bulk DCB by original soil sample; 2-bulk desorption kinetics, followed release over time of bulk DCB after diluting the supernatant at the bulk equilibrated sorption point with solute-free liquid; 3-forward isotope exchange at sorption point, followed uptake over time of trace ¹⁴ C-DCB after allowing bulk DCB to equilibrate at the sorption point; 4-reverse isotope exchange at sorption point, followed release over time of ¹⁴ C-DCB initiated by replacing supernatant with liquid of identical bulk DCB concentration containing only non-labeled DCB after allowing a mixture of nonlabelled and labeled DC to equilibrate at sorption point; 5-reverse isotope exchange at desorption point, same as #4 except carried out at corresponding desorption point.
Matrix, Clay Silts and Organic Carbon, and CEC Bulk Density and Matrix Details	other; NR; NR N ₂ -Brunauer-Emmett-Teller surface areas of brown coal and peat: 1.85 m ² /g and 0.88 g/m ² , respectively; brown coal low-rank coal, Beulah-Zap lignite (BZL) from Argonne National Laboratory, Argonne, IL, USA and peat soil NOM-rich geosorbent, Pahokee peat (PP) reference soil from the International Humic Substances Society (t. Paul, MN, USA)
Media, Recovery, and Statistics	Not Reported; not reported; not reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	not reported; Bulk sorption leveled off within 16 to 32 days. Therefore, 35 days was chosen as the standard equilibrium time.; Bulk desorption leveled off within 16 to 32 days. Therefore, 35 days was chosen as the standard equilibrium time. Bulk DCB isotherms showed concentration-dependent hysteresis
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	K _f and N; not reported; K _f : Freundlich affinity coefficient and N: freundlich exponent; K _f (PP) sorption = 91.6±4.6g ¹ (1-N)/kg L ^N , N = 0.79±0.05; K _f (BZL) sorption = 197.0±9.3g ¹ (1-N)/kg L ^N , N = 0.74±0.05; batch K _f (BZL) = 52.6±3.8 mol ¹ (1-N)/L ^N kg, N = 0.736±0.005
Partition Coefficient Type and Partition Coefficient Results	K: distribution coefficient (L/kg) = q sorbed concentration/C solute concentration; K ^s (obs): observed distribution coefficient of bulk DCB at the sorption point K ^{FIES} (obs): observed distribution coefficient of label following forward isotope exchange at the sorption point K ^{FIES} (obs)/K ^s (obs): PP - 1.00±0.02 (low Ceq), 0.99±0.02 (high Ceq); BZL - 1.01±0.03 (low Ceq), 1.01±0.02 (high Ceq)
Partition Coefficient Phase and Partition Coefficient Results	not specified; Not Reported
Mass Balance	Controls without geosorbent used to correct for chemical loss during equilibration and liquid replacement steps; loss was less than 6% and corrected for.

EVALUATION

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Study Citation:	Sander, M., Pignatello, J. J. (2009). Sorption irreversibility of 1,4-dichlorobenzene in two natural organic matter-rich geosorbents. Environmental Toxicology and Chemistry 28(3):447-457.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	4912138			
		EVALUATION		
Domain		Metric	Rating	Comments
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	The test substance source and purity were 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.
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 (soil characteristics).
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	High	System types and designs were appropriate.
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	Medium	There were minor differences between the assessment methodology and the intended outcome assessment; soil partition coefficients not reported.
	Metric 12:	Test Substance Purity	High	Sampling methods were appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study type.
	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 detail regarding analytical methods.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Calculations were clearly described.
Domain 8: Other				

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Study Citation:	Sander, M., Pignatello, J. J. (2009). Sorption irreversibility of 1,4-dichlorobenzene in two natural organic matter-rich geosorbents. Environmental Toxicology and Chemistry 28(3):447-457.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	4912138			
		EVALUATION		
Domain		Metric	Rating	Comments
	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:	Southworth, G. R., Keller, J. L. (1986). Hydrophobic sorption of polar organics by low organic carbon soils. Water, Air, and Soil Pollution 28(3-4):239-248.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	1485719

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; other: Shake flask sorption study
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	No; Aldrich, Inc.; NR; NR Notes: used without further purification
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Aqueous phase sampled; Not reported
pH, Test Temperature, Buffer, and Test Details	Apison 4.5; Fullerton 4.4; Dormont 4.2; based on 2:1 suspension in distilled water; 25°C; Not reported; Vials with 0.5 to 1.0 mg/L test chemical and soils were shaken for 24 hrs and centrifuged. Soil:water ratio ranged from 1:1 to 1:66
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; Apison: 4% sand, 10% silt, 86% clay, 0.11% OC; Fullerton: 11% sand, 21% silt, 68% clay, 0.05% OC; Dormont: 2% sand, 38% silt, 60% clay, 1.2% OC; Apison 76 meq 100/g; Fullerton 64 meq 100/g; Dormont 129 meq 100/g
Bulk Density and Matrix Details	Not reported; Three subsoils used: Apison (Anderson Co. TN), Fullerton (Anderson Co. TN), and Dormont (Mongolia Co. WV)
Media, Recovery, and Statistics	Water; Not reported; Data analyzed by linear least-squares regression analysis
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	Not reported; Not reported; Not reported; Not reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Koc; Apison Koc = 665±105; Fullerton Koc = 850±270; Dormont Koc = 280±105
Partition Coefficient Phase and Partition Coefficient Results	soil-water; Sorption coefficient Kp calculated as the ratio of solid-phase concentration to the final aqueous phase concentration. Soil OC normalized sorption coefficients Koc calculated by dividing each measurement of Kp by the fractional OC content of the soil.
Mass Balance	Not reported

EVALUATION			
Domain	Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High
	Metric 2:	Test Substance Purity	Medium
Domain 2: Test Design	Metric 3:	Study Controls	Medium
	Metric 4:	Test Substance Stability	Medium

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Study Citation:	Southworth, G. R., Keller, J. L. (1986). Hydrophobic sorption of polar organics by low organic carbon soils. Water, Air, and Soil Pollution 28(3-4):239-248.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1485719			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Test conditions were reported.
	Metric 7:	Testing Consistency	N/A	Testing conditions were consistent.
	Metric 8:	System Type and Design	High	The system type was appropriate.
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 the intended outcome of interest.
	Metric 12:	Test Substance Purity	Medium	The sampling methods were described with limited detail and 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 the study type.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	High	The data reporting was appropriate.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical analysis was reported and sufficient.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.

Overall Quality Determination**High**

* Related References: Cited in ECHA

Study Citation:	Sun, F., Zhou, Q. (2010). Interactive effects of 1,4-dichlorobenzene and heavy metals on their sorption behaviors in two Chinese soils. Archives of Environmental Contamination and Toxicology 58(1):33-41.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	1002411

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Guideline not specified; Sorption Kf and Koc determination
Solvent, Reactivity, Storage, Stability	Methanol; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Tokyo Chemical Industry Co. Ltd. (Japan); NR; 99% Notes: Methanol HPLC grade
Sampling Frequency, Sampling Details, and Number of Replicates	Once; Extracted from aqueous solution with n-hexane (3x) and concentrated with a rotary evaporator; Not reported
pH, Test Temperature, Buffer, and Test Details	7.99; 20±2°C; None; 0.35 g soil and 35 mL background solution with 1-15 mg/L test substance shaken in glass centrifuges for 48 h. Phases separated by centrifugation for 20 m at 3000 rpm for analysis
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 3.44% organic carbon, 0.24% organic nitrogen; 23.22 cmolc/kg
Bulk Density and Matrix Details	75.59% 0.05 - 0.001 mm; 17.10% < 0.001 mm; Soil to solution ratio 1:100 (w/v)
Media, Recovery, and Statistics	Phaeozem soil from Jilin Province; 98.3%; ±4.7%
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not applicable; Calculated as initial - solution concentration; Measured in overlying solution
Reference Substance, Reference Substance Results, and Percent Adsorption	Control tube without soil sample; Negligible loss from photochemical decomposition, volatilization, and sorption to glass tube; Not reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Koc; 7,677.33; 6,336.14; 5,229.25; At test substance concentrations of 1, 2, and 4 mg/L, respectively; 264.10
Partition Coefficient Type and Partition Coefficient Results	Freundlich isotherm model; Deviated significantly from linearity (n = 0.723, r ² = 0.994)
Partition Coefficient Phase and Partition Coefficient Results	solids-water in soil; Not Reported
Mass Balance	No headspace left in test vial to prevent evaporation loss; Adsorption measured as difference between initial concentration and concentration detected in solution

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	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	Controls were run concurrently.

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Study Citation:	Sun, F., Zhou, Q. (2010). Interactive effects of 1,4-dichlorobenzene and heavy metals on their sorption behaviors in two Chinese soils. Archives of Environmental Contamination and Toxicology 58(1):33-41.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1002411			
Domain		Metric	EVALUATION Rating	Comments
	Metric 4:	Test Substance Stability	High	Steps were taken to evaluate non-soil absorption loss, such as volatilization and biodegradation.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	Test method was suitable for measurement of absorption.
	Metric 6:	Testing Conditions	High	Test conditions were clearly delineated.
	Metric 7:	Testing Consistency	High	Testing consistency was suitable.
	Metric 8:	System Type and Design	High	Design was reasonable for measurement of absorption.
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	Outcome assessment was appropriate.
	Metric 12:	Test Substance Purity	Low	Sampling details were not provided.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Steps were taken to account for non-absorption loss, such as volatilization and biodegradation.
	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	Data reporting was reasonable, but some details were omitted.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were clearly described and address the dataset.
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:	Sun, F., Zhou, Q. (2010). Interactive effects of 1,4-dichlorobenzene and heavy metals on their sorption behaviors in two Chinese soils. Archives of Environmental Contamination and Toxicology 58(1):33-41.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	1002411

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Guideline not specified; Sorption Kf and Koc determination
Solvent, Reactivity, Storage, Stability	Methanol; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Tokyo Chemical Industry Co. Ltd. (Japan); NR; 99% Notes: Methanol HPLC grade
Sampling Frequency, Sampling Details, and Number of Replicates	Once; Extracted from aqueous solution with n-hexane (3x) and concentrated with a rotary evaporator; Not reported
pH, Test Temperature, Buffer, and Test Details	7.02; 20±2°C; None; 0.35 g soil and 35 mL background solution with 1-15 mg/L test substance shaken in glass centrifuges for 48 h. Phases separated by centrifuging for 20 m at 3000 rpm for analysis
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 1.04% organic carbon, 0.09% organic nitrogen; 17.60 cmolc/kg
Bulk Density and Matrix Details	67.09% 0.05 - 0.001 mm; 29.92% < 0.001 mm; Soil to solution ratio 1:100 (w/v)
Media, Recovery, and Statistics	Burozem soil from Liaoning Province; 98.3%; ±4.7%
Transformation Products, Equilibrium	Not applicable; Calculated as initial - solution concentration; Measured in overlying solution
Adsorption Details, and Equilibrium Desorption Details	
Reference Substance, Reference Substance Results, and Percent Adsorption	Control tube without soil sample; Negligible loss from photochemical decomposition, volatilization, and sorption to glass tube; Not reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption	Koc; 21,163.46; 18,309.29; 15,840.04; At test substance concentrations of 1, 2, and 4 mg/L, respectively; 220.10
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Freundlich isotherm model; Deviated significantly from linearity (n = 0.791, r ² = 0.996)
Partition Coefficient Phase and Partition Coefficient Results	solids-water in soil; Not Reported
Mass Balance	No headspace left in test vial to prevent evaporation loss; Adsorption measured as difference between initial concentration and concentration detected in solution

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	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	Controls were run concurrently.
	Metric 4:	Test Substance Stability	High	Steps were taken to evaluate non-soil absorption loss, such as volatilization and biodegradation.

Domain 3: Test Conditions

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Study Citation:	Sun, F., Zhou, Q. (2010). Interactive effects of 1,4-dichlorobenzene and heavy metals on their sorption behaviors in two Chinese soils. Archives of Environmental Contamination and Toxicology 58(1):33-41.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1002411			
EVALUATION				
Domain		Metric	Rating	Comments
	Metric 5:	Test Method Suitability	High	Test method was suitable for measurement of absorption.
	Metric 6:	Testing Conditions	High	Test conditions were clearly delineated.
	Metric 7:	Testing Consistency	High	Testing consistency was suitable.
	Metric 8:	System Type and Design	High	Design was reasonable for measurement of absorption.
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	Outcome assessment was appropriate.
	Metric 12:	Test Substance Purity	Low	Sampling details were not provided.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Steps were taken to account for non-absorption loss, such as volatilization and biodegradation.
	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	Data reporting was reasonable, but some details were omitted.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were clearly described and address the dataset.
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:	Ten Hulscher, T. E. M., Vrind, B. A., Van den Heuvel, H., Van der Velde, L. E., Van Noort, P. C. M., Beurskens, J. E. M., Govers, H. A. J. (1998). Triphasic desorption of highly resistant chlorobenzenes, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons in field contaminated sediment. Environmental Science & Technology 33(1):126-132.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	1487082

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	No; Experimental; other: desorption kinetics and partitioning in long term field contaminated sediment cores and top layer sediment measured by gas-purging
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Field samples; NR; NR Notes: NR
Sampling Frequency, Sampling Details, and Number of Replicates	not reported; not reported; 2
pH, Test Temperature, Buffer, and Test Details	not reported; 20.0±0.05°C; not reported; Duplicate sediment samples of about 25 g wet weight were suspended in thermostated purge vessels with a Tenax trap system; gas flow = 600-1000 mL/min; duration: 624 hours
Matrix, Clay Silts and Organic Carbon, and CEC	other; organic carbon = 6.71% (core) and 4.3% (top sediment); not reported
Bulk Density and Matrix Details	not reported; Water with a composition similar to freshwater was used
Media, Recovery, and Statistics	Freshwater sediment from the 40- 120 cm section core sampled in March 1995 at Lake Ketelmeer, The Netherlands; 91-121%; reported with results
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	not reported; Desorption from sediment was triphasic: fast, slowly, and very slowly; Desorption rate constants (10-3 h-1) top sediments = 5.1Å±0.6 and 3.4Å±0.4 for slowly desorbing fractions, 0.16Å±0.02 and 0.10Å±0.02 for very slowly desorbing fractions; sediment core = 0.57Å±0.03 and 0.51Å±0.03 for very slowly desorbing fractions.; Concentration in the top layer = 459 µg/kg dw, sediment core = 710 and 740 µg/kg dw; concentration in water declined during the first 100-400 h of purging; not reported
Desorption Type	not reported; not reported
Partition Coefficient Type and Partition Coefficient Results	not reported; not reported
Partition Coefficient Phase and Partition Coefficient Results	natural water-sediment; not reported
Mass Balance	150Å±26%

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	Medium	Contaminated field samples; analytical standard not reported.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	The metric is not applicable to this study type.

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Study Citation:	Ten Hulscher, T. E. M., Vrind, B. A., Van den Heuvel, H., Van der Velde, L. E., Van Noort, P. C. M., Beurskens, J. E. M., Govers, H. A. J. (1998). Triphasic desorption of highly resistant chlorobenzenes, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons in field contaminated sediment. Environmental Science & Technology 33(1):126-132.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1487082			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable.
	Metric 6:	Testing Conditions	Medium	Sediment characteristics not reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	High	The system type and design was appropriate for the test.
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 outcome of interest.
	Metric 12:	Test Substance Purity	High	Sampling methods were reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Sources of variability and uncertainty in the measurements and statistical techniques and between duplicates were not reported in the study.
	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	Some data and analytical detail were omitted.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were clearly described.
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		High		

Study Citation:	ten Hulscher, T. E., Vrind, B. A., van Noort, P. C., Govers, H. A. (2002). Resistant sorption of in situ chlorobenzenes and a polychlorinated biphenyl in river Rhine suspended matter. Chemosphere 49(10):1231-1238.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	2163858

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; other: Field study and gas-purge technique for desorption kinetics
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Sampling Frequency, Sampling Details, and Number of Replicates	after 2, 4, 6 and 24 h of purging; Suspended matter from Rhine sampled on Oct 12, 1998; 2
pH, Test Temperature, Buffer, and Test Details	Not reported; 20°C; Not reported; 25g of suspended matter in 1L water stirred for 48hrs then leading nitrogen gas continuously through the suspension initiating volatilization; purging time 2209 hrs (3 mo)
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 4.3±0.2% OC; Not reported
Bulk Density and Matrix Details	Not reported; Rhine river suspended matter
Media, Recovery, and Statistics	Not reported; Not reported; Not reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not reported; Not reported; Desorption rate constant (based on 2-compartment model): kslow (10-3 h-1) = 7.0; 4.5; kveryslow (10-3 h-1) = 0.15; 0.14
Reference Substance, Reference Substance Results, and Percent Adsorption	Not reported; Not reported; overall % desorbed in 2209 h = 41.1; 43.9; % desorbed fast = 0.95; 1.27; % desorbed slow = 19.8; 26.9; % desorbed very slow = 80.2; 73.1
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption	Not reported; Not reported; Not reported; Not reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Not reported; Not reported
Partition Coefficient Phase and Partition Coefficient Results	suspended matter-water; 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 definitively.
	Metric 2:	Test Substance Purity	Low	Purity and use of analytical standards were not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	Field studies do not require negative controls.

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Study Citation:	ten Hulscher, T. E., Vrind, B. A., van Noort, P. C., Govers, H. A. (2002). Resistant sorption of in situ chlorobenzenes and a polychlorinated biphenyl in river Rhine suspended matter. Chemosphere 49(10):1231-1238.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	2163858			
Domain		Metric	EVALUATION Rating	Comments
	Metric 4:	Test Substance Stability	Medium	The test substance stability, homogeneity, 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	Medium	Matrix details and characteristics were not fully reported.
	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	High	The system type and design were appropriate.
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	This 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 the study.
	Metric 12:	Test Substance Purity	High	The study used sampling methods that are acceptable and address the outcomes of interest.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	No confounding variables were noted.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this type of study.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Analytical details (MDL; % recovery) were omitted.
	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	Medium	The study results are reasonable.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	Uchrin, C. G., Katz, J., Mangels, G., Hunter, J. V. (1986). Characterization of the sorption of toxic and hazardous organic substances to groundwater aquifer solids. Studies in Environmental Science 29:663-676.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	5247220

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; p-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Guideline not specified, sorption batch experiment
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NA; NR; NR; NR
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; 5 mL aliquot of solution taken from centrifuged test tube; Not reported
pH, Test Temperature, Buffer, and Test Details	Not reported; Not reported; Not reported; 5 g soil, saturated with 2.5 mL organic free water and spiked with 25 mL test substance solution, in a 50 mL screw-top test tube with Teflon-lined caps
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 2.0% clay/ 8.0% silt/ 90.0% sand/ 4.4% organic matter; Not reported
Bulk Density and Matrix Details	Not reported; Soil collected from Cohansey aquifer system near Catsworth NJ
Media, Recovery, and Statistics	Not reported; Not reported; Not reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not reported; Agitated by wrist shakers, equilibrium achieved after 24 h; Supernatant decanted and replaced with 25 mL organic-free water, test tubes were sealed and agitated for 24 h
Reference Substance, Reference Substance Results, and Percent Adsorption	Soil-free blank; Losses from volatilization and glassware sorption were negligible; Not reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Comments, and Adsorption	Not Reported; Not Reported; Not Reported; 0.0405
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Freundlich Isotherm; Not Reported
Partition Coefficient Phase and Partition Coefficient Results	soil-water; $1/n = 0.618r = 0.894C$ (concentration in solution) = 0.098 - 1.90Normalized desorption isotherm parametersReversible component (slope): 0.254Resistant component (intercept): 0.749r = 0.93
Mass Balance	Calculated from the loss from solution

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 and purity were not reported.
Domain 2: Test Design	Metric 3: Study Controls	High	A soil-free blank was included and losses were negligible.
	Metric 4: Test Substance Stability	Medium	The test substance preparation and storage conditions were not reported.

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Study Citation:	Uchrin, C. G., Katz, J., Mangels, G., Hunter, J. V. (1986). Characterization of the sorption of toxic and hazardous organic substances to groundwater aquifer solids. Studies in Environmental Science 29:663-676.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5247220			
Domain	Metric	EVALUATION		Comments
		Rating		
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 were not reported (temperature, pH, and CEC).
	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 system was capable of maintaining test substance concentrations.
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 methods address the outcomes of interest and used widely acceptable methods.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty between samples was 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	Extraction efficiency and detection limits were not reported. Mass balance was not directly reported but non-sorptive losses were negligible based on the blank. Analytical methods were appropriate.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Sorption kinetic calculations were described and 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:	Uchrin, C. G., Katz, J., Mangels, G., Hunter, J. V. (1986). Characterization of the sorption of toxic and hazardous organic substances to groundwater aquifer solids. Studies in Environmental Science 29:663-676.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	5247220

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Guideline not specified, sorption batch experiment
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NA; NR; NR; NR
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; 5 mL aliquot of solution taken from centrifuged test tube; Not reported
pH, Test Temperature, Buffer, and Test Details	Not reported; Not reported; Not reported; 5 g soil, saturated with 2.5 mL organic free water and spiked with 25 mL test substance solution, in a 50 mL screw-top test tube with Teflon-lined caps
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 5.6% clay/ 24.0% silt/ 70.4% sand/ 2.2% organic matter; Not reported
Bulk Density and Matrix Details	Not reported; Soil collected from Potomac-Raritan-Magothy aquifer system near Princeton NJ
Media, Recovery, and Statistics	Not reported; Not reported; Not reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not reported; Agitated by wrist shakers, equilibrium achieved after 24 h; Supernatant decanted and replaced with 25 mL organic-free water, test tubes were sealed and agitated for 24 h
Reference Substance, Reference Substance Results, and Percent Adsorption	Soil-free blank; Losses from volatilization and glassware sorption were negligible; Not reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Not Reported; Not Reported; Not Reported; 0.320
Partition Coefficient Type and Partition Coefficient Results	Freundlich Isotherm; Not Reported
Partition Coefficient Phase and Partition Coefficient Results	soil-water; $1/n = 0.178r = 0.773C$ (concentration in solution) = 0.147-7.82Normalized desorption isotherm parametersReversible component (slope): 0.228Resistant component (intercept): 0.778r = 0.62
Mass Balance	Calculated from the loss from solution

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 and purity were not reported.
Domain 2: Test Design	Metric 3: Study Controls	High	A soil-free blank was included and losses were negligible.
	Metric 4: Test Substance Stability	Medium	The 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.

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Study Citation:	Uchrin, C. G., Katz, J., Mangels, G., Hunter, J. V. (1986). Characterization of the sorption of toxic and hazardous organic substances to groundwater aquifer solids. Studies in Environmental Science 29:663-676.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5247220			
Domain		Metric	EVALUATION Rating	Comments
	Metric 6:	Testing Conditions	Medium	Some test conditions were not reported (temperature, pH, and CEC).
	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 system was capable of maintaining test substance concentrations.
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 methods address the outcomes of interest and used widely acceptable methods.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty between samples was 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	Extraction efficiency and detection limits were not reported. Mass balance was not directly reported but non-sorptive losses were negligible based on the blank. Analytical methods were appropriate.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Sorption kinetic calculations were described and 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:	Uchrin, C. G., Lewis, T. E. (1988). Modelling sorption and degradation of toxic and hazardous substances in ground water systems. Studies in Environmental Science 34(C):153-167.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	5247211

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Guideline not specified, sorption batch experiments
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NA; NR; NR; NR
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; 5 mL aliquot taken from each vial; Not reported
pH, Test Temperature, Buffer, and Test Details	Not reported; 21°C; Not reported; 5 g soil saturated with 0.5 - 5.0 mL water added to 50 mL screw cap test tubes, test substance added, sealed with Teflon lined caps and shaken.
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 2.0% clay/8.0% silt/90.0% sand/4.4% organic matter; Not reported
Bulk Density and Matrix Details	1.78; Cohansey soil from Chatsworth, NJ; 0.55 porosity
Media, Recovery, and Statistics	Not reported; Not reported; Not reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	Not reported; Not Reported; Liquid centrifugate drained and replaced with 25 mL clean water and agitated for 24 h
Reference Substance, Reference Substance Results, and Percent Adsorption	Blank, without soil; Not Reported; Not Reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption	Linear; Langmuir; Freundlich; 34.7; 0.595; 4.05; $r^2 = 0.54, 0.92, \text{ and } 0.79$, respectively; Not Reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Linear; 34.7
Partition Coefficient Phase and Partition Coefficient Results	soil-water; Linear coefficient reported in conclusions as final result
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	N/A	The test substance source and purity were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	A control without soil was included and tested valid.
	Metric 4:	Test Substance Stability	Medium	No details on test substance preparation or storage conditions were reported.

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Study Citation:	Uchrin, C. G., Lewis, T. E. (1988). Modelling sorption and degradation of toxic and hazardous substances in ground water systems. Studies in Environmental Science 34(C):153-167.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5247211			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the substance.
	Metric 6:	Testing Conditions	High	Appropriate test conditions were reported for the study.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples and study groups.
	Metric 8:	System Type and Design	High	The system reached equilibrium and was capable of maintaining test substance concentrations.
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	The sampling methods were appropriate and addressed the outcome methodology.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability and uncertainty were not explicitly addressed in the study.
	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 methods were suitable for detection and quantification of the test substance, extraction efficiency and mass balance were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Adsorption coefficient calculation was described clearly.
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		

* Related References: Cited in ECHA

Study Citation:	Valsaraj, K. T., Kommalapati, R. R., Robertson, E. D., Constant, W. D. (1999). Partition constants and adsorption-desorption hysteresis for volatile organic compounds on soil from a Louisiana Superfund site. Environmental Monitoring and Assessment 58(2):225-241.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	661142

EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene			
Confidentiality, Type, Guideline	None; Experimental; other: ASTM Standard Method E 1195–87			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; Aldrich Chemical Company (Milwaukee, WI); NR; >98% Notes: DCB			
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Diluted if necessary; Not reported			
pH, Test Temperature, Buffer, and Test Details	PS = 7.4; PC = 4.3; RSC = 5.8; Not reported; Not reported; Pleistocene Sand (PS), Pleistocene Clay (PC), Recent Silty Clay (RSC); glass bottles shaken for 48 hrs and centrifuged at 8000 rpm; desorption period 24-48 hrs			
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 77.5% sand, 9.4% silt, 13.1% clay, 0.11% OC; sum of bases: 4.4 meq/100			
Bulk Density and Matrix Details	surface area: 7 m2/g; Uncontaminated soil from Baton Rouge Bayou area in Louisiana			
Media, Recovery, and Statistics	Kd: Glass centrifuge tube: 5 g of soil and 40 mL of water containing either 1, 10 or 60 mg/L of test substance; Koc: water spiked with 2.5 mg/L test substance; 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	Controls run with only test substance and no soils; Not reported; Not reported			
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type	Kd (L/kg); Kd = 0.34 (PS), 5.86 (PC), 13.4 (RSC); Extreme care was taken in order to minimize loss due to volatilization; Not reported			
Partition Coefficient Type and Partition Coefficient Results	log Koc (L/kg); 2.74 +/- 0.45			
Partition Coefficient Phase and Partition Coefficient Results	soil-water; Derived from slope of Kd/Foc plot, based on Kd values obtained for each soil type and each soil foc (fraction of organic carbon)			
Mass Balance	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	High	The test substance source and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Test results were not reported; however, the lack of reporting not likely to have a substantial impact on the interpretation of the study results.
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Study Citation:	Valsaraj, K. T., Kommalapati, R. R., Robertson, E. D., Constant, W. D. (1999). Partition constants and adsorption-desorption hysteresis for volatile organic compounds on soil from a Louisiana Superfund site. Environmental Monitoring and Assessment 58(2):225-241.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	661142			
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	Medium	There were omissions in testing conditions; however, sufficient data were reported to determine that the omissions were not likely to have had a substantial impact on the study results.
	Metric 7:	Testing Consistency	Medium	Testing details were omitted and had limited detail; however, the lack of data is not likely to hinder the interpretation of the results.
	Metric 8:	System Type and Design	High	Standard method; the system type and design were appropriate.
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	Limited detail; however, the lack of reporting not likely to have a substantial impact on study results
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	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	High	Overall acceptable; guideline study.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical analysis was not reported.
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.

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Study Citation:	Valsaraj, K. T., Kommalapati, R. R., Robertson, E. D., Constant, W. D. (1999). Partition constants and adsorption-desorption hysteresis for volatile organic compounds on soil from a Louisiana Superfund site. Environmental Monitoring and Assessment 58(2):225-241.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	661142

		EVALUATION	
Domain	Metric	Rating	Comments
Overall Quality Determination		High	

Study Citation:	van Gestel, C. A. M., Ma, W., Smita, C. E. (1991). Development of QSARs in terrestrial ecotoxicology: Earthworm toxicity and soil sorption of chlorophenols, chlorobenzenes and dichloroaniline. Science of the Total Environment 109-110:589-604.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	647138

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Non-guideline adsorption experiments
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Merck; NR; $\geq 98\%$
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Not reported; 2
pH, Test Temperature, Buffer, and Test Details	KOBG: 4.8, OECD: 5.9; Not reported; Not reported; Experiments in stoppered centrifuge tubes. Concentrations in soil calculated from the aqueous phase concentration with 1 to 20 mg/L test substance and shaken with soil
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; KOBG: 1.4% clay/7.5% silt/86.5% sand/3.7% organic and OECD: 8.1% clay/7.4% silt/72.1% sand/5.9% organic; Not reported
Bulk Density and Matrix Details	Not reported; KOBG a sandy soil and OECD is an artificial soil
Media, Recovery, and Statistics	0.01 M CaCl ₂ ; 90 and 107%; 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; KOBG: 8, OECD: 18 (1/n= KOBG: 0.96, OECD: 0.65)
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Comments, and Adsorption	
Desorption Type	Not reported; Not reported
Partition Coefficient Type and Partition Coefficient Results	Not reported; Not reported
Partition Coefficient Phase and Partition Coefficient Results	
Mass Balance	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	High	The source and purity of the test substance was reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Control group was included but not reported in detail.
	Metric 4:	Test Substance Stability	High	Test substance stability was evaluated.

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Study Citation:	van Gestel, C. A. M., Ma, W., Smita, C. E. (1991). Development of QSARs in terrestrial ecotoxicology: Earthworm toxicity and soil sorption of chlorophenols, chlorobenzenes and dichloroaniline. Science of the Total Environment 109-110:589-604.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	647138			
Domain		EVALUATION		Comments
	Metric	Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable.
	Metric 6:	Testing Conditions	High	Test conditions were reported and appropriate.
	Metric 7:	Testing Consistency	High	Test conditions were consistent.
	Metric 8:	System Type and Design	Medium	Equilibrium was not reported. The system type and design were appropriate.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric is not applicable to this type of study.
	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	High	The outcome assessment methodology addressed the intended outcome of interest.
	Metric 12:	Test Substance Purity	High	Sampling methods were appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Sources of variability and uncertainty in the measurements, and statistical techniques were not reported in detail.
	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	High	Data reporting was acceptable.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Calculations were clearly described and address the dataset.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	High	The study results were reasonable.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to this type of study.
Overall Quality Determination			High	

Study Citation:	Van Zoest, R., Van Eck, G. T. M. (1991). Occurrence and behaviour of several groups of organic micropollutants in the Scheldt estuary. Science of the Total Environment 103(1):57-71.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	5471921

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	no; monitoring study; other: monitoring study used to calculate sediment-water partition coefficients
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; natural waters; NR; NR Notes: NR
Sampling Frequency, Sampling Details, and Number of Replicates	Sampling conducted between August 1987 and Jan 1989 at sampling stations along the Scheldt estuary.; Four stations were sampled 5x; 4 dm3 water samples and "some" grams of suspended particulate matter were collected.; not reported
pH, Test Temperature, Buffer, and Test Details	not reported; ambient; salinity: Hoboken = 0.45, Buoy 87 = 6.1, Hansweert = 13.4, Vlissingen = 25.8; Monitoring of heavily polluted Scheldt estuary, major source for contaminants: River Scheldt; residence time of estuarine water is 2 to 3 months
Matrix, Clay Silts and Organic Carbon, and CEC	other; not reported; not reported
Bulk Density and Matrix Details	not reported; suspended particulate matter samples
Media, Recovery, and Statistics	natural waters; >80%; not reported
Transformation Products, Equilibrium	not reported; not reported; not reported
Adsorption Details, and Equilibrium Desorption Details	
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	not reported; not reported; not reported; not reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Koc; log Koc (reported for both 1,2-DCB and 1,4-DCB combined) = 3.5 (median) 3-4 (range)
Partition Coefficient Phase and Partition Coefficient Results	sediment-water; Data from two monitoring campaigns used to calculate sediment-water partition coefficients. Concentrations at sampling stations (median, range): Hoboken = 91, 83-99 ng/g (particulate) and 158, ND-315 ng/dm3 (dissolved); Buoy 87 = 68, 48-88 ng/g (particulate) and ND, ND-ND ng/dm3 (dissolved); Hansweert = 50, 29-70 ng/g (particulate) and ND, ND-ND ng/dm3 (dissolved); Vlissingen = 39, ND-79 ng/g (particulate) and ND, ND-ND ng/dm3 (dissolved).
Mass Balance	Not Reported

EVALUATION				
Domain	Metric	Rating	Comments	
Domain 1: Test Substance	Metric 1:	Test Substance Identity	High	The test substance was identified clearly.
	Metric 2:	Test Substance Purity	N/A	The metric is not applicable to this study type.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	The metric is not applicable to this study type.

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Study Citation:	Van Zoest, R., Van Eck, G. T. M. (1991). Occurrence and behaviour of several groups of organic micropollutants in the Scheldt estuary. Science of the Total Environment 103(1):57-71.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5471921			
Domain		EVALUATION		
	Metric	Rating	Comments	
	Metric 4:	Test Substance Stability	N/A	The metric is not applicable to this study type.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	Target chemical concentrations in the natural environment.
	Metric 6:	Testing Conditions	Medium	Site conditions, water and sediment characteristics, were not reported.
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this study type.
	Metric 8:	System Type and Design	Medium	Equilibrium is assumed in field studies; however, results indicated non-equilibrium conditions based on comparison using Karickhoff's (1981) empirical relation.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this type of study.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this type of study.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Uninformative	Results not specific to target isomer.
	Metric 12:	Test Substance Purity	High	Sampling was appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variables affecting equilibrium were addressed.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this type of study.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Details for second sampling campaign were not reported; results were used for calculations.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this type of study.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Uninformative	Results were not presented for specific target chemical.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this type of study.

Overall Quality Determination**Uninformative**

Study Citation:	Wakeham, S. G., Canuel, E. A., Doering, P. H. (1986). Geochemistry of volatile organic compounds in seawater: Mesocosm experiments with ¹⁴ C-model compounds. <i>Geochimica et Cosmochimica Acta</i> 50(6):1163-1172.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	5247132

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; ¹⁴ C 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Guideline not specified, Marine Ecosystems Research Laboratory (MERL) mesocosm experiment
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	1,4-dichloro-[U- ¹⁴ C]-benzene; NR; NR; NR Notes: Test substance mixture of radiolabeled and unlabeled substance
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; measured in particulates; Not reported
pH, Test Temperature, Buffer, and Test Details	Not reported; 8 - 12°C; Not reported; Marine mesocosm where 0.5 - 2 ug/L test substance and 200-700 uCi radiolabeled test substance added to solution and measured in suspended particulate
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; Not reported; Not reported
Bulk Density and Matrix Details	Not reported; Marine water and particulate
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	log K _{oc} (L/kg OC); 2.7; Not reported; Not Reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Not Reported; Not Reported
Partition Coefficient Phase and Partition Coefficient Results	suspended matter-water; Not Reported
Mass Balance	Not reported

EVALUATION			
Domain	Metric	Rating	Comments
Domain 1: Test Substance	Metric 1:	High	The test substance was identified by name.
	Metric 2:	Low	The test substance source and purity were not reported but may have been reported elsewhere.
Domain 2: Test Design			
	Metric 3:	Medium	Controls were not explicitly included in the study.

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Study Citation:	Wakeham, S. G., Canuel, E. A., Doering, P. H. (1986). Geochemistry of volatile organic compounds in seawater: Mesocosm experiments with 14C-model compounds. Geochimica et Cosmochimica Acta 50(6):1163-1172.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	5247132			
Domain		Metric	EVALUATION	
			Rating	Comments
	Metric 4:	Test Substance Stability	N/A	Test substance preparation and storage was not reported however may have been reported elsewhere.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable for the test substance.
	Metric 6:	Testing Conditions	N/A	Testing conditions may have been reported elsewhere.
	Metric 7:	Testing Consistency	High	Test was conducted consistently across study groups.
	Metric 8:	System Type and Design	Medium	Equilibrium was established but the test substance was likely lost to volatilization in the microcosm.
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	N/A	Sampling methods may have been reported elsewhere.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty and variability 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	Analytical methods may have been reported elsewhere, mass balance was monitored but not explicitly reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical methods were not explicitly 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			High	

Study Citation:	Watts, C. D., Moore, K. (1988). Fate and transport of organic compounds in rivers. Commission of the European Communities Water Pollution Research Reports, 4 :154-168.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4933297

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Not reported; Samples collected up and downstream discharge point of sewage treatment works to determine fate and transport of pollutants
Solvent, Reactivity, Storage, Stability	NA; NR; River filter papers stored at -20°C, filtered water samples stored at 4°C, sediment stored in glass jars with aluminum foil lined screw tops and stored at -20°C; NR
Radiolabel, Source, State, Purity	NA; River samples collected upstream and downstream from discharge point of sewage treatment works. River surface sediment samples collected from banks and midstream above and below discharge point.; NA; NA
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; 10 min composite grab samples collected from the river, suspended particles filtered and retained for analysis up and downstream of discharge point; bank and midstream sediment samples collected up and downstream of discharge point.; Not reported
pH, Test Temperature, Buffer, and Test Details	8.0 (upstream), 7.7 (downstream), 7.2 (effluent); 6.9 (upstream), 8.5 (downstream), 11.3 (sewage effluent)°C; Not reported; Water and filtered suspended particulate samples collected and analyzed to determine substance partitioning
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; OC: 15.96±0.71% (upstream), 31.46±2.18% (downstream), 40.67±1.47% (effluent); Not reported
Bulk Density and Matrix Details	Not reported; Suspended particulate (8.6 mg/L upstream, 19.9 mg/L downstream, 39.3 mg/L effluent)
Media, Recovery, and Statistics	River water or sewage treatment plant effluent; Not reported; Not reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; 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	log Koc; 2.99; Calculated based on log Koc = 0.989 log Kow - 0.346, where log Kow = 3.37; Not Reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Log Kp; 2.47
Partition Coefficient Phase and Partition Coefficient Results	suspended matter-water; Water concentration: 5 - 50 ng/L; calculated particle concentration: 0.0015 - 0.015 ng/mgCalculated based on Koc = foc x Kp
Mass Balance	Substance was not detected in suspended particulate, concentrations are based on calculations

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 A general description of the study site was reported.
Domain 2: Test Design			
	Metric 3:	Study Controls	Medium Field or analytical blanks were not explicitly included.

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Study Citation:	Watts, C. D., Moore, K. (1988). Fate and transport of organic compounds in rivers. Commission of the European Communities Water Pollution Research Reports, 4 :154-168.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	4933297			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 4:	Test Substance Stability	High	Sample collection and preparation was reported and acceptable.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The field study was acceptable for the test substance.
	Metric 6:	Testing Conditions	High	Temperature, pH, and organic carbon content were reported.
	Metric 7:	Testing Consistency	High	Samples were collected, analyzed, and processed consistently.
	Metric 8:	System Type and Design	High	Field studies are assumed to be in dynamic equilibrium.
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 allowed the determination of Koc and Kp values.
	Metric 12:	Test Substance Purity	Medium	Sampling methods addressed the outcomes of interest however frequency was not reported and temporal variation cannot be addressed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	GC-FID and GC-MS detected concentrations were comparable. Representativeness of samples was assessed.
	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	Analytical methods were reported, however limits of detection were not reported and percent recovery was not conducted. Partitioning was not differentiated between up and downstream. The test substance was not detected in particulate or sediment, which resulted in these concentrations being estimated by mass balance calculations and log Kow relationships to partitioning.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not conducted.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	The test substance was not detected in the solid phase; the field study concentrations were based on mass balance calculations and previously observed log Koc and Kp relationships to log Kow. Because the field partitioning values are unverifiable estimates, the overall quality of this study value is low.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

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Study Citation:	Watts, C. D., Moore, K. (1988). Fate and transport of organic compounds in rivers. Commission of the European Communities Water Pollution Research Reports, 4 :154-168.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4933297

Domain	Metric	EVALUATION Rating	Comments
Overall Quality Determination		High	

Study Citation:	Watts, C. D., Moore, K. (1988). Fate and transport of organic compounds in rivers. Commission of the European Communities Water Pollution Research Reports, 4 :154-168.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4933297

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; p-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Not reported; Samples collected up and downstream discharge point of sewage treatment works to determine fate and transport of pollutants
Solvent, Reactivity, Storage, Stability	NA; NR; River filter papers stored at -20°C, filtered water samples stored at 4°C, sediment stored in glass jars with aluminum foil lined screw tops and stored at -20°C; NR
Radiolabel, Source, State, Purity	NA; River samples collected upstream and downstream from discharge point of sewage treatment works. River surface sediment samples collected from banks and midstream above and below discharge point.; NA; NA
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; 10 min composite grab samples collected from the river, suspended particles filtered and retained for analysis up and downstream of discharge point; bank and midstream sediment samples collected up and downstream of discharge point.; Not reported
pH, Test Temperature, Buffer, and Test Details	8.0 (upstream), 7.7 (downstream), 7.2 (effluent); 6.9 (upstream), 8.5 (downstream), 11.3 (sewage effluent)°C; Not reported; Water and filtered suspended particulate samples collected and analyzed to determine substance partitioning
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; OC: 1.28±0.10% (upstream), 0.54±0.07% (downstream); Not reported
Bulk Density and Matrix Details	Not reported; Sediment
Media, Recovery, and Statistics	River water or sewage treatment plant effluent; Not reported; Not reported
Transformation Products, Equilibrium	NA; Not reported; Not reported
Adsorption Details, and Equilibrium Desorption Details	
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	log Koc; 2.99; Calculated based on log Koc = 0.989 log Kow - 0.346, where log Kow = 3.37; Not Reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Log Kp; 0.72
Partition Coefficient Phase and Partition Coefficient Results	suspended matter-water; Water concentration: 5 - 50 ng/L; calculated sediment concentration: 2.6E-5 - 2.6E-4 ug/gCalculated based on Koc = foc x Kp,
Mass Balance	Substance was not detected in suspended particulate, concentrations are based on calculations

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	A general description of the study site was reported.
Domain 2: Test Design			
	Metric 3: Study Controls	Medium	Field or analytical blanks were not explicitly included.
	Metric 4: Test Substance Stability	High	Sample collection and preparation was reported and acceptable.

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Study Citation:	Watts, C. D., Moore, K. (1988). Fate and transport of organic compounds in rivers. Commission of the European Communities Water Pollution Research Reports, 4 :154-168.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	4933297			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The field study was acceptable for the test substance.
	Metric 6:	Testing Conditions	High	Temperature, pH, and organic carbon content were reported.
	Metric 7:	Testing Consistency	High	Samples were collected, analyzed, and processed consistently.
	Metric 8:	System Type and Design	High	Field studies are assumed to be in dynamic equilibrium.
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 allowed the determination of Koc and Kp values.
	Metric 12:	Test Substance Purity	Medium	Sampling methods addressed the outcomes of interest however frequency was not reported and temporal variation cannot be addressed.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	GC-FID and GC-MS detected concentrations were comparable. Representativeness of samples was assessed.
	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	Analytical methods were reported, however limits of detection were not reported and percent recovery was not conducted. Partitioning was not differentiated between up and downstream. The test substance was not detected in particulate or sediment, which resulted in these concentrations being estimated by mass balance calculations and log Kow relationships to partitioning.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Statistical analysis was not conducted.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	The test substance was not detected in the solid phase; the field study concentrations were based on mass balance calculations and previously observed log Koc and Kp relationships to log Kow. Because the field partitioning values are unverifiable estimates, the overall quality of this study value is low.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination**High**

Study Citation:	Wilson, J. T., Enfield, C. G., Dunlap, W. J., Cosby, R. L., Foster, D. A., Baskin, L. B. (1981). Transport and fate of selected organic pollutants in a sandy soil. Journal of Environmental Quality 10(4):501-506.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	3797830

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Not reported; sorption determination as part of fate and transport in sandy soil study
Solvent, Reactivity, Storage, Stability	Water; NR; Feed solution kept on ice, in a Teflon gas-sampling bag with a Teflon septum valve; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; Aqueous effluent and trapped volatiles analyzed; sorption determined by mass balance calculations; 3
pH, Test Temperature, Buffer, and Test Details	6.4 (soil), 7.2 (water); 20±1°C; None; 0.80 and 0.13 mg/L test substance applied to borosilicate columns packed with the soil for 45 d, columns received Columns received 14 cm water per day, effluent collected for analysis
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; 2.1% clay, 5.9% silt, 92% sand, 0.087% organic carbon; 3.5
Bulk Density and Matrix Details	1.65 g/cm ³ ; Sandy soil from Ada, Oklahoma
Media, Recovery, and Statistics	Spring water; Extraction efficiency: 49-98% (volatiles), 58-74% (aqueous); Acceptable agreement with log water solubility
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; Steady state reached at 25 d; NA
Reference Substance, Reference Substance Results, and Percent Adsorption	Column receiving spring water alone; Not reported; Not reported
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption	log K _{oc} ; Approx. 2.6; Estimated from graph; reported for high and low concentrations; Not Reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Not Reported; Not Reported
Partition Coefficient Phase and Partition Coefficient Results	soil-water; Not Reported
Mass Balance	Volatilized: Not determined Column effluent (high, low concentration): 37±4%, 49±10% Degraded or not accounted for (high, low concentration): 63±4%, 51±10%

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 and purity were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	High	A negative control was included, the results of which were not reported but assumed to be within an acceptable range.

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Study Citation:	Wilson, J. T., Enfield, C. G., Dunlap, W. J., Cosby, R. L., Foster, D. A., Baskin, L. B. (1981). Transport and fate of selected organic pollutants in a sandy soil. Journal of Environmental Quality 10(4):501-506.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	3797830			
Domain		Metric	EVALUATION Rating	Comments
	Metric 4:	Test Substance Stability	High	Test substance preparation and storage was 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	Soil and water characteristics were reported, temperature was reported.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups.
	Metric 8:	System Type and Design	High	The system was capable of maintaining test substance concentrations and equilibrium was established.
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 methods were appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Concentrations in soil were not measured and soil was not sterilized; based on the method as reported, there is not a way to distinguish between biodegradation and sorption
	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 analytical method was appropriate, extraction efficiencies were reported, mass balance was accounted for however sorption and biodegradation loss was not differentiated. Partitioning was normalized to organic carbon content.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Kinetic calculations not reported.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results agreed with known sorption relationships to water solubility, however based on the method sorption loss was not differentiated from biodegradation loss and this was not addressed in data evaluation.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.

Overall Quality Determination**High**

* Related References: HSDB; same as HERO ID 18237

Study Citation:	Wise, W. R., Charbeneau, R. J. (1994). In situ estimation of transport parameters a field demonstration. Groundwater 32(3):420-430.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1482440			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene			
Confidentiality, Type, Guideline	None; Experimental; other: Linear sorption coefficients obtained from a field aquifer in Conroe, Texas			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: 1,4-DCB			
Sampling Frequency, Sampling Details, and Number of Replicates	Not reported; injection and production wells sampled; Not reported			
pH, Test Temperature, Buffer, and Test Details	Not reported; Not reported; Not reported; Field demonstration/in-situ parameter estimation; 3500 ug/L p-DCB was pumped into the center well at 1.89 L/min			
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; Not reported; Not reported			
Bulk Density and Matrix Details	Not reported; UCC site is an abandoned creosoting facility with Superfund designation occurring after the present study			
Media, Recovery, and Statistics	aquifer; Not reported; 90% confidence			
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	biotransformation constant = 0.22/day; 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	linear sorption with decay; linear sorption without decay; Sorption coefficient Ks = 0.082, transformation rate constant λ = 0.22/days; Sorption coefficient Ks = 0.088, transformation rate constant λ = 0/days; Not reported; Freundlich sorption (no decay) A = 0.0009 B = 680; Langmuir sorption (no decay) K = 0.36 ug/L Q = 690 ug/L			
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 clearly.	
Metric 2:	Test Substance Purity	Low	Source and purity were not reported.	
Domain 2: Test Design				
Metric 3:	Study Controls	Low	Controls were not reported.	
Metric 4:	Test Substance Stability	Low	Test substance storage and stability were not reported.	
Domain 3: Test Conditions				
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Study Citation:	Wise, W. R., Charbeneau, R. J. (1994). In situ estimation of transport parameters a field demonstration. Groundwater 32(3):420-430.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	1482440			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was suitable.
	Metric 6:	Testing Conditions	Medium	Limited details on site conditions were reported.
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this type of study.
	Metric 8:	System Type and Design	High	The test system was appropriate.
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 type of study.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	High	The outcome of interest was addressed by the methodology.
	Metric 12:	Test Substance Purity	Medium	Limited details on sampling methods were reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	No confounding variables were identified.
	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 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	Methods and calculations were clearly described and appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results are reasonable.
	Metric 18:	QSAR Models	Medium	The calculations and estimation were defined with an unambiguous endpoint.

Overall Quality Determination**Medium**

Study Citation:	Wu SC, Gschwend, P. M. (1986). Sorption kinetics of hydrophobic organic compounds to natural sediments and soils. Environmental Science & Technology 20(7):717-725.
OECD Harmonized Template:	Adsorption and Desorption
HERO ID:	4932590

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; other: Not reported
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Foxboro/Analabs Co. (North Haven, CT); NR; NR Notes: Used as received.
Sampling Frequency, Sampling Details, and Number of Replicates	15 times between 0.1 and 10000 minutes; 90 cm ³ /s air pumped into reaction vessel to strip test substance to detector; Not reported
pH, Test Temperature, Buffer, and Test Details	Not reported; 22°C; Not reported; 50 mL soil and test substance in water added to 2L reactor
Matrix, Clay Silts and Organic Carbon, and CEC	Not Reported; < 8.5% organic carbon (Slightly less than the combustible loss at 550 deg C, for 25 min, 17.0%); Not reported
Bulk Density and Matrix Details	dry density: 2.25 g/cm ³ ; Charles River sediments (Charles River, MA)
Media, Recovery, and Statistics	Water; Not reported; Not Reported
Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details	NA; bubbling for first hour, then in brief periods, for 2 or 3 days; Not Reported
Reference Substance, Reference Substance Results, and Percent Adsorption	Water blank; Not reported; 39%
Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption	Not Reported; Not Reported; Not Reported; Not Reported
Desorption Type	
Partition Coefficient Type and Partition Coefficient Results	Kp; 87 cm ³ /g
Partition Coefficient Phase and Partition Coefficient Results	Not Reported; Effective intraparticle diffusivity = 1E-9 cm ² /sStarting concentration: 4.4 uMSolid concentration: 17900 mg/LFitting porosity, n= 0.17
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	Medium	The source but not purity of the test substance was reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Water only controls were included, sorption to the test vessel controls were not included.
	Metric 4:	Test Substance Stability	High	Test substance preparation was reported in great detail.
Domain 3: Test Conditions				

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Study Citation:	Wu SC, Gschwend, P. M. (1986). Sorption kinetics of hydrophobic organic compounds to natural sediments and soils. Environmental Science & Technology 20(7):717-725.			
OECD Harmonized Template:	Adsorption and Desorption			
HERO ID:	4932590			
Domain		Metric	EVALUATION Rating	Comments
	Metric 5:	Test Method Suitability	High	The test method was appropriate for the test substance.
	Metric 6:	Testing Conditions	Medium	Limited soil characteristics were reported. Organic carbon content was not clearly 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 system was capable of maintaining test substance concentrations.
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 K _p .
	Metric 12:	Test Substance Purity	High	Sampling methods were appropriate and were collected at an appropriate frequency for a kinetics study.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Low details on soil characteristics, study more focused on particle size influence.
	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 analytical method was reported generally but appropriate; limit of detection was not reported. Raw data reported graphically.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Sorption calculations were described in depth and were appropriate.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The results were reasonable but without soil characteristics or clear organic content broader conclusions cannot be determined. Results support intraparticle diffusion impact sorption kinetics.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			High	

Study Citation:	Buszka, P. M., Yeskis, D. J., Kolpin, D. W., Furlong, E. T., Zaugg, S. D., Meyer, M. T. (2009). Waste-indicator and pharmaceutical compounds in landfill-leachate-affected ground water near Elkhart, Indiana, 2000-2002. Bulletin of Environmental Contamination and Toxicology 82(6):653-659.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	4912133			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene			
Confidentiality, Type, Guideline	no; monitoring; monitoring			
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	test chemical concentration measured at an observation well downgradient from a landfill near Elkhart, Indiana and at a domestic well in a neighborhood east of the landfill; The domestic well water had concentrations of acetaminophen and caffeine larger than the concentrations detected in the observation well water; the authors suggest this indicates domestic well water may be contaminated by nearby septic systems. However, leachate contamination of the domestic well water was also indicated by the presence of benzene, chloroform, 1,2-dichloroethane, vinyl chloride, 1,1-dichloroethane, arsenic, sodium, and calcium.; duplicate samples were obtained and analyzed			
System Type Design	Not Reported			
Sampling Frequency and Sampling Details	twice for wells downgradient from the landfill, once for domestic well samples; sample dates were 11/16/2000 and 10/31/2002			
Test Temperature	NR			
Results Details	average concentrations were <0.5 ug/L for all samples, from downgradient wells and domestic wells.			
Analytical Method and Analytical Details	GC/MS; referenced method Zaugg et al 2002: detection limit 0.5 ug/L			
Transformation Products, Statistics, and Kinetics	Not Reported; 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 name.
	Metric 2:	Test Substance Purity	Medium	The analytical substance source or purity were not reported; however, the omissions were not likely to have a substantial impact on the study results.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Some concurrent control details were not reported; however, the lack of data was not likely to have a substantial impact on study results.
	Metric 4:	Test Substance Stability	N/A	This metric is not applicable to this study type.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Low	The test method does not address a fate parameter.
	Metric 6:	Testing Conditions	Medium	Testing conditions were monitored, reported, and appropriate for the method.
	Metric 7:	Testing Consistency	Medium	Some test conditions across samples or study groups were not reported, but these discrepancies were not likely to have a substantial impact on study results.
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Study Citation:	Buszka, P. M., Yeskis, D. J., Kolpin, D. W., Furlong, E. T., Zaugg, S. D., Meyer, M. T. (2009). Waste-indicator and pharmaceutical compounds in landfill-leachate-affected ground water near Elkhart, Indiana, 2000-2002. Bulletin of Environmental Contamination and Toxicology 82(6):653-659.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	4912133			
Domain	Metric	EVALUATION		Comments
	Metric 8:	System Type and Design	High	Equilibrium is assumed under field conditions.
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	Uninformative	The chemical was not detected in any wells sampled; therefore, the assessment methodology did not address or report an outcome 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	N/A	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	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	Medium	kinetic calculations were not clearly described.
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**Uninformative**

Study Citation:	Gerstle, R., Carvatti, J. (1987). Sludge incineration and hazardous air pollutants. Sludge Management Series 17:169-174.
OECD Harmonized Template:	Miscellaneous
HERO ID:	5475887

EXTRACTION

Parameter	Data
CASRN and Test Material	Not Reported; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	no; experimental; experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; municipal sewage sludge; NR; NR Notes: NR
Test Method Details, Test Condition Details, and Test Consistency	Evaluation of emissions from a sewage sludge incineration process.; Multiple-hearth incineration operating at 13-15 tons/hour, excess air rate: 134% at scrubber inlet.; not reported
Details	
System Type Design	Multiple-hearth incineration with 12 hearths and conventional impinger-type scrubber
Sampling Frequency and Sampling Details	not reported; Samples (3 sets) collected before and after scrubber following a modified EPA method 5
Test Temperature	Max temp: 1420°F
Results Details	Inlet = 4.0 ppb, 0.0025 lb/h; Outlet = 3.6 ppb, 0.003 lb/h; removal efficiency 0%
Analytical Method and Analytical Details	GC-MS; not reported
Transformation Products, Statistics, and Kinetics	not reported; 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.
	Metric 2: Test Substance Purity	N/A	The metric is not applicable to this type of study.
Domain 2: Test Design			
	Metric 3: Study Controls	N/A	The study did not require concurrent control groups.
	Metric 4: Test Substance Stability	N/A	The metric is not applicable to this type of study.
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	N/A	The metric is not applicable to this type of study.
	Metric 8: System Type and Design	High	The system type and design were described.
Domain 4: Test Organisms			

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Study Citation:	Gerstle, R., Carvatti, J. (1987). Sludge incineration and hazardous air pollutants. Sludge Management Series 17:169-174.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5475887			
Domain		Metric	EVALUATION Rating	Comments
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable to this type of study.
	Metric 10:	Sampling Methods	N/A	The metric is not applicable to this type of study.
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	N/A	The metric is not applicable to the study type.
	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	Analytical details were omitted.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to the study type.
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 the study type.
Overall Quality Determination			High	

Study Citation:	Jacobs, L. W., Zabik, M. J. (1983). Importance of sludge-borne organic chemicals for land application programs. :418.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5490434			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene			
Confidentiality, Type, Guideline	None; experimental; experimental			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	None; NR; NR; NR			
Test Method Details, Test Condition Details, and Test Consistency Details	Sewage sludge samples were collected form 204 municipal wastewater treatment plants in Michigan.; not applicable; not applicable			
System Type Design	not applicable			
Sampling Frequency and Sampling Details	June - December 1980; 2 samples collected from each treatment plant			
Test Temperature	not applicable			
Results Details	detected in 141 of 215 samples at 0.0402-633 mg/kg dry weight			
Analytical Method and Analytical Details	GC; extracted with cyclohexane			
Transformation Products, Statistics, and Kinetics	not applicable; mean 12.0 mg/kg dry weight; median 2.02 mg/kg dry weight; not applicable			
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 by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source or purity were not reported; however, the omissions or identified impurities were not likely to have a substantial impact on the study results.
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	Uninformative	Only Effluent concentrations reported; Influent concentrations not reported; WWTP type(s) not reported.
	Metric 6:	Testing Conditions	N/A	Not applicable (monitoring study).
	Metric 7:	Testing Consistency	N/A	Not applicable (monitoring study).
	Metric 8:	System Type and Design	Uninformative	WWTP types not reported.

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Study Citation:	Jacobs, L. W., Zabik, M. J. (1983). Importance of sludge-borne organic chemicals for land application programs. :418.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5490434			
Domain	Metric	EVALUATION		Comments
		Rating		
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric is not applicable to this type of study.
	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	N/A	Not applicable (monitoring study).
	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	N/A	Not applicable (monitoring study).
	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	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	N/A	Not applicable (monitoring 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		Uninformative		

Study Citation:	Keefe, S. H., Barber, L. B., Runkel, R. L., Ryan, J. N. (2004). Fate of volatile organic compounds in constructed wastewater treatment wetlands. Environmental Science & Technology 38(7):2209-2216.
OECD Harmonized Template:	Miscellaneous
HERO ID:	3566693

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Calculation; Calculation
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	Experiment was conducted at the H1 wetland at the Tres Rios Demonstration Wetlands, located near the Salt River in Maricopa County, southwest of Phoenix, AZ; In June 1999, the wetland contained ca. 30% emergent vegetation including softstem bulrush, Olney's bulrush, and duckweed growth on the deep zone water surface; the hydraulic loading rate was 15 cm d-1.; Quadruplicate water samples were collected in 40-mL amber glass bottles at the inlet splitter box, in each deep zone, and at the wetland outlet of the wetland on February 16, 2000.
System Type Design	Processes governing solute transport and volatilization were quantified using measured field data and the OTIS (one-dimensional transport with inflow and storage)
Sampling Frequency and Sampling Details	February 16, 2000, 4 samples; The bottles were submerged to the midpoint of the water column and filled with no headspace to prevent volatilization losses, preserved by the addition of 0.5mL of hydrochloric acid and 250 mg of ascorbic acid, and stored at 4°C until analysis.
Test Temperature	Water temperature 24.6°C; wind velocities averaged 1.2m s-1 with a range of 0.4-1.9 m s-1 on February 16, 2000 measured 3 m above the ground from the Arizona Meteorological Network Litchfield weather gauging station located approximately 30 km away.
Results Details	Mass Flux to the Atmosphere = 0.69 g/d/ha
Analytical Method and Analytical Details	Water samples were analyzed for VOCs using a Tekmar model LSC 2000 concentrator with a Tekmar Aquatek automatic purge and- trap unit followed by GC/MS; VOC removal was simulated using the solute transport OTIS model with the inverse, theoretical, and graphical volatilization rates.
Transformation Products, Statistics, and Kinetics	Not reported; 95% confidence interval reported for t1/2; OTIS was used to quantify the effects of first-order volatilization on VOC transport using the physical transport parameters estimated from the bromide tracer data and inverse, two-film, and graphically determined volatilization rates.
Reference Substance and Reference Substance Results	unspecified bromide tracer; Not applicable

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 was identified by analytical means.
Domain 2: Test Design			
	Metric 3: Study Controls	N/A	The metric is not applicable to this study type.
	Metric 4: Test Substance Stability	N/A	The metric is not applicable to this study type.
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	N/A	The metric is not applicable to this study type.

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Study Citation:	Keefe, S. H., Barber, L. B., Runkel, R. L., Ryan, J. N. (2004). Fate of volatile organic compounds in constructed wastewater treatment wetlands. Environmental Science & Technology 38(7):2209-2216.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	3566693			
Domain		Metric	EVALUATION Rating	Comments
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this study type.
	Metric 8:	System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	Medium	The test organisms were reported, but were not routinely used.
	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	This is primarily a modeling study based on field samples.
	Metric 12:	Test Substance Purity	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.
	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	This metric met the criteria for high confidence as expected for this type of study.
	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	Medium	The study results were reasonable.
	Metric 18:	QSAR Models	High	This metric met the criteria for high confidence as expected for this type of study.
Overall Quality Determination			High	

Study Citation:	Kuntz, K. W., Warry, N. D. (1983). Chlorinated organic contaminants in water and suspended sediments of the lower Niagara River. Journal of Great Lakes Research 9(2):241-248.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1989859

EXTRACTION	
Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, Type, Guideline	None; other; other
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	None; NR; NR; NR Notes: 1,4-Di
Test Method Details, Test Condition Details, and Test Consistency Details	samples were collected from a single point in the Niagara River at Niagara-on-the-Lake. Concurrent water and suspended sediments were collected.; not applicable; not applicable
System Type Design	not applicable
Sampling Frequency and Sampling Details	every 2 wks from April 1979-Dec 1981; Suspended solids collected in continuous flow separator at a flow rate of 6 L/min for about 24 hours. 28 samples collected
Test Temperature	not applicable
Results Details	68% detection; mean concentration 180 ng/g dry weight.
Analytical Method and Analytical Details	GC; Not Reported
Transformation Products, Statistics, and Kinetics	not applicable; 198 ng/g dry weight standard deviation.; loading rate of 310 kg/yr to Lake Ontario by Niagara River suspended sediments (1980-1981)
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 by name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported; however, the omissions or identified impurities were not likely to have a substantial impact on the study results.
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	Medium	The test method was suitable for the test substance with minor deviations which were not likely to have a substantial impact on study results.
	Metric 6:	Testing Conditions	N/A	The metric is not applicable to this study type.

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Study Citation:	Kuntz, K. W., Warry, N. D. (1983). Chlorinated organic contaminants in water and suspended sediments of the lower Niagara River. Journal of Great Lakes Research 9(2):241-248.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	1989859			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 7:	Testing Consistency	N/A	The metric is not applicable to this study type.
	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	Medium	There was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	Metric 12:	Test Substance Purity	Medium	Minor limitations were identified in sampling methods of the outcome(s) 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	Medium	Sources of variability were discussed.
	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	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:	Liljestrand, H. M., Lee, Y. D. (1991). Sorption kinetics of non-ionic organic pollutants onto suspended sediment. Water Science and Technology 23(1/3):447-454.
OECD Harmonized Template:	Miscellaneous
HERO ID:	5254562

EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene and 1,2-dichlorobenzene			
Confidentiality, Type, Guideline	no; experimental; experimental			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: Mixture of dichlorobenzenes			
Test Method Details, Test Condition Details, and Test Consistency Details	Sorption kinetic experiments performed with a mixture of dichlorobenzenes in sediments collected from Lake Austin; Not Reported; NR			
System Type Design	NR			
Sampling Frequency and Sampling Details	NR; NR			
Test Temperature	NR			
Results Details	diffusion coefficient= 1E-10 cm^2/s; characteristic transport time t(diffusion) based on particle size: bulk sediment: 32 sec; > 60 um: 110 sec; 30-60 um: 36 sec; 10-30 um: 20 sec; <10 um: 3 sec			
Analytical Method and Analytical Details	NR; NR			
Transformation Products, Statistics, and Kinetics	NR; NR; NR			
Reference Substance and Reference Substance Results	NR; NR			
EVALUATION				
Domain	Metric	Rating	Comments	
Domain 1: Test Substance	Metric 1:	Test Substance Identity	Low	States test substance as mixture of dichlorobenzenes.
	Metric 2:	Test Substance Purity	Low	The purity and test substance source were not reported
Domain 2: Test Design	Metric 3:	Study Controls	Low	No control groups were reported.
	Metric 4:	Test Substance Stability	Low	Test substance stability was not reported.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	Medium	The test method was suitable.
	Metric 6:	Testing Conditions	Low	Minimal test conditions were reported.
	Metric 7:	Testing Consistency	Low	The testing consistency was not reported.
	Metric 8:	System Type and Design	Low	System type and design were not reported.
Domain 4: Test Organisms	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type.

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Study Citation:	Liljestrand, H. M., Lee, Y. D. (1991). Sorption kinetics of non-ionic organic pollutants onto suspended sediment. Water Science and Technology 23(1/3):447-454.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5254562			
EVALUATION				
Domain		Metric	Rating	Comments
	Metric 10:	Sampling Methods	N/A	This metric does not apply to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Low	The outcome of interest was not reported.
	Metric 12:	Test Substance Purity	Low	Sampling details were not fully reported.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Confounding variables were not reported.
	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	Low	The analytical method was not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	Low	statistical analysis was not described clearly.
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	A QSAR model was not reported.
Overall Quality Determination			Low	

Study Citation:	Matter-Müller, C., Gujer, W., Giger, W., Stumm, W. (1980). Non-biological elimination mechanisms in a biological sewage treatment plant. Progress in Water Technology 12:299-314.
OECD Harmonized Template:	Miscellaneous
HERO ID:	5254867

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; p-DCB
Confidentiality, Type, Guideline	None; Experimental; Experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; Raw waste water of the city of Zurich (mainly domestic); NR; NA
Test Method Details, Test Condition Details, and Test Consistency Details	Determination of absorption into activated sludge and mass transfer of volatile substances into the atmosphere, samples collected from March 2-4, 1976; Operating conditions (plant 3, plant 4):Flowrate: 91.2, 55.2 m ³ /dayAeration tank volume: 11.3, 15.0 m ³ Sludge age: 3.1, 7.6 daysSludge production: 8.1, 4.9 kgTS/dayAeration rate constant: 1068, 1767m ³ /day COD: 0.65, 0.60; Initial test substance concentration: 0.1 - 0.5 mg/m ³
System Type Design	Semi-technical scale activated sludge treatment plant treated influent wastewater (precipitated with FeCl ₃) via two activated sludge processes operated in parallel, with surface aerators
Sampling Frequency and Sampling Details	Not reported; Not reported
Test Temperature	Not reported
Results Details	Removal efficiency: >99% (plant 3), >99% (plant 4)Mass balance (% influent mass flow; plant 3, plant 4):Excess sludge: 0, 0Effluent suspended solids: 0, 0Total particulate matter: 0, 0Secondary effluent: n.d., n.d.Mass flux to atmosphere: n.d., n.d.Mass balance: n.d., n.d.
Analytical Method and Analytical Details	High pressure liquid chromatography - UV detector; Primary and secondary effluents were liquid-liquid extracted into methylene chloride; activated sludge freeze dried and Soxhlet extracted. Detection limit: 0.1 - 0.2 mg/m ³
Transformation Products, Statistics, and Kinetics	Not reported; 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 name.
	Metric 2: Test Substance Purity	High	The sample source containing the test substance was reported.
Domain 2: Test Design			
	Metric 3: Study Controls	Medium	Control groups were not explicitly included.
	Metric 4: Test Substance Stability	Medium	Test substance storage conditions were not reported.
Domain 3: Test Conditions			
	Metric 5: Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6: Testing Conditions	High	Most operating conditions were reported, except for temperature.
	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.

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Study Citation:	Matter-Müller, C., Gujer, W., Giger, W., Stumm, W. (1980). Non-biological elimination mechanisms in a biological sewage treatment plant. Progress in Water Technology 12:299-314.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5254867			
Domain	Metric	EVALUATION		Comments
		Rating		
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	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	High	Sampling methods address the outcomes of interest and were appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability and uncertainty were not explicitly addressed in the dataset.
	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	Target chemical concentrations and mass balance were reported; the test substance was often below detection limit and the authors noted that the analytical methods had poor accuracy
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical analysis was 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:	Matter-Müller, C., Gujer, W., Giger, W., Stumm, W. (1980). Non-biological elimination mechanisms in a biological sewage treatment plant. Progress in Water Technology 12:299-314.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5254867			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; p-DCB			
Confidentiality, Type, Guideline	None; Experimental; Experimental			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; Raw waste water of the city of Zurich (mainly domestic); NR; NA			
Test Method Details, Test Condition Details, and Test Consistency Details	Determination of absorption into activated sludge and mass transfer of volatile substances into the atmosphere, samples collected from March 15-28, 1976; Operating conditions (plant 3, plant 4):Flowrate: 110.4, 50.4 m^3/dayAeration tank volume: 11.7, 11.7 m^3Sludge age: 3.1, 7.6 daysSludge production: 10.5, 5.1 kgTS/dayAeration rate constant: 1068, 1767 m^3/day COD: 0.65, 0.60; Initial test substance concentration: 0.1 - 0.5 mg/m^-3			
System Type Design	Semi-technical scale activated sludge treatment plant treated influent wastewater (precipitated with FeCl3) via two activated sludge processes operated in parallel, with surface aerators			
Sampling Frequency and Sampling Details	Not reported; Not reported			
Test Temperature	Not reported			
Results Details	Removal efficiency: 90% (plant 3), 80% (plant 4)Mass balance (% influent mass flow; plant 3, plant 4):Excess sludge: 6, 0Effluent suspended solids: <1, 0Total particulate matter: 7, 0Secondary effluent: 10, 20Mass flux to atmosphere: 57, >100Mass balance: 74, 290			
Analytical Method and Analytical Details	High pressure liquid chromatography - UV detector; Primary and secondary effluents were liquid-liquid extracted into methylene chloride; activated sludge freeze died and Soxhlet extracted. Detection limit: 0.1 - 0.2 mg/m^3			
Transformation Products, Statistics, and Kinetics	Not reported; 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 name.
	Metric 2:	Test Substance Purity	High	The sample source containing the test substance was reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	Medium	Control groups were not explicitly included.
	Metric 4:	Test Substance Stability	Medium	Test substance storage conditions were not reported.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6:	Testing Conditions	High	Most operating conditions were reported, except for temperature.
	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				
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Study Citation:	Matter-Müller, C., Gujer, W., Giger, W., Stumm, W. (1980). Non-biological elimination mechanisms in a biological sewage treatment plant. Progress in Water Technology 12:299-314.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5254867			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 9:	Outcome Assessment Methodology	High	The inoculum source was reported and is used for similar study types.
	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	High	Sampling methods address the outcomes of interest and were appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Variability and uncertainty were not explicitly addressed in the dataset.
	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	Target chemical concentrations and mass balance were reported; ; the test substance was often below detection limit and the authors noted that the analytical methods had poor accuracy
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	Statistical analysis was 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	106-46-7; pDCB
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	DRE was determined for selected pollutants in an Upjohn System incinerator at Upjohn Company in LaPorte, Texas.; Residence time: 5.2 secHeat input: 6.2 - 6.3E6 kJ/hrExcess oxygen in stack: 8.1 - 8.4%; 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	Burner/ignition chamber, thermal oxidizer, quench, packed tower
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	1116°C
Results Details	DRE: 99.9990, 99.995, and 99.9990
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
		Metric 10:	Sampling Methods	N/A
Domain 5: Outcome Assessment		Metric 11:	Test Substance Identity	High
		Metric 12:	Test Substance Purity	High
Domain 6: Confounding/Variable Control		Metric 13:	Confounding Variables	High
		Metric 14:	Health Outcomes Unrelated to Exposure	N/A
Domain 7: Data Presentation and Analysis		Metric 15:	Data Reporting	High
		Metric 16:	Statistical Methods and Kinetic Calculations	High
Domain 8: Other		Metric 17:	Verification or Plausibility of Results	High
		Metric 18:	QSAR Models	N/A
Overall Quality Determination			High	

Study Citation:	Monsanto, (1987). Monsanto Pensacola plant ground water assessment feasibility study with 19 chemicals with attachments and cover letter dated 121887.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	4214180			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene			
Confidentiality, Type, Guideline	None; Monitoring data and modeling; Monitoring data and modeling			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	NR; Contaminated site; NR; NA Notes: NR			
Test Method Details, Test Condition Details, and Test Consistency Details	Monitoring sample from Monsanto Pensacola Plant groundwater; NA; NR			
System Type Design	NR			
Sampling Frequency and Sampling Details	NR; NR			
Test Temperature	NR			
Results Details	Concentration of 0.0001 mg/L detected at well no. 2pt-13; modeling results 4.4E-6 to 1.1E-10 mg/L			
Analytical Method and Analytical Details	Assumed the Florida Groundwater and Surface Quality Criteria in appendix was used.; NR			
Transformation Products, Statistics, and Kinetics	NR; NR; NR			
Reference Substance and Reference Substance Results	NR; NR			
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	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	N/A	This metric does not apply to this type of study.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	Uninformative	Lack of information resulted in serious flaws that make the study unusable.
	Metric 6:	Testing Conditions	Uninformative	Lack of information resulted in serious flaws that make the study unusable.
	Metric 7:	Testing Consistency	N/A	This metric does not apply to this type of study.
	Metric 8:	System Type and Design	N/A	This metric does not apply to this type of study.
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	This metric does not apply to this type of study.
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Study Citation:	Monsanto, (1987). Monsanto Pensacola plant ground water assessment feasibility study with 19 chemicals with attachments and cover letter dated 121887.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	4214180			
Domain	Metric	EVALUATION Rating	Comments	
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Medium	There was incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to be severe or have a substantial impact on the study results.
	Metric 12:	Test Substance Purity	Low	
	Details regarding sampling methods of the outcome(s) were not fully reported, and the omissions were likely to have a substantial impact on study results.			
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	This metric does not apply to this type of study.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	This metric does not apply to this type of study.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Concentrations of the target chemical or transformation product(s), extraction efficiency, percent recovery, or mass balance were not measured or reported, preventing meaningful interpretation of study results.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Limited statistical and/or kinetic details reported; however, these differences were not likely to have a substantial impact on study results.
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 type of study.
Overall Quality Determination		Uninformative		

Study Citation:	(1982). Fate of Priority Pollutants in Publicly Owned Treatment Works, Volume I.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1265686

EXTRACTION

Parameter	Data
CASRN and Test Material	Not Reported; 1,4-dichlorobenzene
Confidentiality, Type, Guideline	None; experimental; experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	No; NR; NR; NR
Test Method Details, Test Condition Details, and Test Consistency Details	influent, effluent and sludge samples from 50 treatment plants (plant descriptions are available); duplicate and field blanks were included; plant treatments: primary (P); secondary activated sludge (AS); secondary trickling filter (TF); secondary oxygen activated sludge (OAS); secondary rotating biological contactor (RBC); secondary aerated lagoon (AL); secondary parallel activated sludge and trickling filter (AS/TF); tertiary (T); not reported
System Type Design	not reported
Sampling Frequency and Sampling Details	influent, effluent, sludge; in general: six consecutive days; 24 hour samples; more detail are available.
Test Temperature	not applicable
Results Details	not reported
Analytical Method and Analytical Details	EPA base-neutral protocol; mean recovery 48-74% and 73±38%
Transformation Products, Statistics, and Kinetics	not applicable; % detection @ influent concentration: 17% @ 2-200 ug/L (POTW 1-40); 12% @ 4-60 ug/L (POTW 51-60); effluent concentrations: 3% @ 3-9 ug/L (POTW 1-40); 2% @ 4-4 ug/L (POTW 51-60); sludge concentrations: 17% @ 2-12,000 ug/L (POTW 1-40); 29% @ 55-3700 ug/L (POTW 51-60); not reported
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 by common name.
Metric 2:	Test Substance Purity	N/A	The metric is not applicable to the study type.
Domain 2: Test Design			
Metric 3:	Study Controls	High	Concurrent blanks and controls were analyzed.
Metric 4:	Test Substance Stability	N/A	The metric is not applicable to the study type.
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	The conditions were documented.
Metric 8:	System Type and Design	N/A	The metric is not applicable to the study type.
Domain 4: Test Organisms			

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Study Citation:	(1982). Fate of Priority Pollutants in Publicly Owned Treatment Works, Volume I.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	1265686			
		EVALUATION		
Domain	Metric	Rating	Comments	
	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, 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 the 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 expected.
	Metric 18:	QSAR Models	N/A	The metric is not applicable to the study type.
Overall Quality Determination		High		

Study Citation:	Parker, W. J., Thompson, D. J., Bell, J. P., Melcer, H. (1993). Fate of volatile organic compounds in municipal activated sludge plants. Water Environment Research 65(1):58-65.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	2803053			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
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	Samples taken from WWTP to evaluate air stripping and removal of TCE; WWTP; 1,4-Dichlorobenzene average influent: 17.7 ug/L, average effluent: 1.8 ug/L, average gas concentration: 343.0 ng/L, sludge concentration: 10.0 ug/L, 0.8% in waste sludge; Off-gas sampling procedure also had field blanks and duplication of 75% of the samples			
System Type Design	Highland Creek WWTP in Toronto, Ontario (pilot plant study also reported in the study)			
Sampling Frequency and Sampling Details	Off-gas samples from the full-scale aeration basin were collected from 1.49-m2 floating chambers secured by ropes in the aeration basin. A; Wastewater and sludge samples were collected in 60-mL amber, septum top bottles and stored at 4°C			
Test Temperature	NR for full scale plant			
Results Details	74±1% removal of 1,4-dichlorobenzene (68.1% stripped, 21.7% degraded) by full scale aeration basin; gas-liquid phase partition coefficient avg = 135±37 (coarse) and 179±18 (fine) units: (ng/L)/(µg/L).			
Analytical Method and Analytical Details	GC-MSD, ECD and FID; Not applicable			
Transformation Products, Statistics, and Kinetics	Not reported; Std dev 0%; Not reported			
Reference Substance and Reference Substance Results	Not reported; Not reported			
EVALUATION				
Domain	Metric	Rating	Comments	
Domain 1: Test Substance	Metric 1: Metric 2:	Test Substance Identity Test Substance Purity	High High	The test substance was identified by chemical name. The test substance was identified by analytical means.
Domain 2: Test Design	Metric 3: Metric 4:	Study Controls Test Substance Stability	Medium N/A	Chemical name(s) of external control(s) not reported. This is a field type study where stability was not considered.
Domain 3: Test Conditions	Metric 5: Metric 6: Metric 7: Metric 8:	Test Method Suitability Testing Conditions Testing Consistency System Type and Design	High Uninformative N/A Medium	This metric met the criteria for high confidence as expected for this type of study. Testing conditions were not well reported (pH, temperature, sludge concentrations). The metric is not applicable to this study type. Likely an open system where test material could have been lost.
Domain 4: Test Organisms				

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Study Citation:	Parker, W. J., Thompson, D. J., Bell, J. P., Melcer, H. (1993). Fate of volatile organic compounds in municipal activated sludge plants. Water Environment Research 65(1):58-65.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	2803053			
Domain		Metric	EVALUATION Rating	Comments
	Metric 9:	Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for 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	Uninformative	The extent of air stripping is a function of the compound physical-chemical properties and a function of WWTP design and operation.
	Metric 12:	Test Substance Purity	High	This metric met the criteria for high confidence as expected for this type of study.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	This metric met the criteria for high confidence as expected for this type of study.
	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	Some information was not reported; however, these omissions were not likely to have had a substantial impact on the study results.
	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	N/A	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**Uninformative**

* Related References: ECHA rating: 2

Study Citation:	Prasad, S. S. (1992). Predicting the environmental distribution of compounds with unknown physicochemical properties from known pesticide properties. Journal of AOAC International 75(5):916-924.
OECD Harmonized Template:	Miscellaneous
HERO ID:	660424

Parameter		EXTRACTION		
CASRN and Test Material		Not Reported; 1,4-Dichlorobenzene		
Confidentiality, Type, Guideline		none; not specified; not specified		
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		not reported; not reported; not reported		
System Type Design		not reported		
Sampling Frequency and Sampling Details		not reported; not reported		
Test Temperature		not reported		
Results Details		Relative soil volatility (RSV): 5.5 x 10 ⁻² (value corresponds to Moderately Volatile Waste classification by Resource Conservation and Recovery Act)		
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 reported; not reported		
Domain		EVALUATION		
		Metric	Rating	Comments
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified.
	Metric 2:	Test Substance Purity	Medium	The test substance source was not reported in this secondary source.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	The metric is not applicable.
	Metric 4:	Test Substance Stability	Low	Details were not reported in this secondary source.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Low	Details were not reported in this secondary source.
	Metric 6:	Testing Conditions	Low	Details were not reported in this secondary source.
	Metric 7:	Testing Consistency	Low	Details were not reported in this secondary source.
	Metric 8:	System Type and Design	Low	Details were not reported in this secondary source.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	The metric is not applicable.

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Study Citation:	Prasad, S. S. (1992). Predicting the environmental distribution of compounds with unknown physicochemical properties from known pesticide properties. Journal of AOAC International 75(5):916-924.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	660424			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 10:	Sampling Methods	N/A	The metric is not applicable.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Low	Details were not reported in this secondary source.
	Metric 12:	Test Substance Purity	Low	Details were not reported in this secondary source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Details were not reported in this secondary source.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Details were not reported in this secondary source.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable.
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	A QSAR model was not reported.
Overall Quality Determination		Low		

* Related References: HERO ID: 1265573 (not in distiller)Proceedings: International Conference on New Frontiers for Hazardous Waste Management (1985) Report Number 600985025

Study Citation:	Rathbun, R. E. (1998). Transport, behavior, and fate of volatile organic compounds in streams.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	29959			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene			
Confidentiality, Type, Guideline	No; Experimental; Experimental			
Solvent, Reactivity, Storage, Stability	Not Reported; Not Reported; Not Reported; Not Reported			
Radiolabel, Source, State, Purity	Not Reported; Not Reported; Not Reported; Not Reported			
Test Method Details, Test Condition Details, and Test Consistency	Gas scavenging describes gaseous organic compounds partitioning to precipitation and fall to a land or water surface or the concentrations of organic compound in the precipitation divided by the concentration in the air.; Not Reported; Not Reported			
Details				
System Type Design	Not Reported			
Sampling Frequency and Sampling Details	Not Reported; Not Reported			
Test Temperature	8°C			
Results Details	Gas scavenging ratio (Wg) = 39±10			
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 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	Medium	Not reported in this secondary source; the source cited likely contains more detail.	
Domain 2: Test Design				
Metric 3:	Study Controls	Medium	Not reported in this secondary source; the source cited likely contains more detail.	
Metric 4:	Test Substance Stability	Medium	Not reported in this secondary source; the source cited likely contains more detail.	
Domain 3: Test Conditions				
Metric 5:	Test Method Suitability	Medium	Not reported in this secondary source; the source cited likely contains more detail.	
Metric 6:	Testing Conditions	Medium	Not reported in this secondary source; the source cited likely contains more detail.	
Metric 7:	Testing Consistency	Medium	Not reported in this secondary source; the source cited likely contains more detail.	
Metric 8:	System Type and Design	Medium	Not reported in this secondary source; the source cited likely contains more detail.	
Domain 4: Test Organisms				
Metric 9:	Outcome Assessment Methodology	N/A	This metric is not applicable to this type of study.	
Metric 10:	Sampling Methods	N/A	This metric is not applicable to this type of study.	
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Study Citation:	Rathbun, R. E. (1998). Transport, behavior, and fate of volatile organic compounds in streams.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	29959			
Domain	Metric	EVALUATION Rating		Comments
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	Not reported in this secondary source; the source cited likely contains more detail.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Not reported in this secondary source; the source cited likely contains more detail.
	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	Medium	Not reported in this secondary source; the source cited likely contains more detail.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Not reported in this secondary source; the source cited likely contains more detail.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Not reported in this secondary source; the source cited likely contains more detail.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to this type of study.

Overall Quality Determination**Medium**

* Related References: Citing Ligocki, M.P., Leuenberger, C., and Pankow, J.F ., 1985, Trace organic compounds in rain-II, Gas scavenging of neutral organic compounds: Atmospheric Environment, v. 19, no. 10, p. 1609-1617. HERO ID 724845.

Study Citation:	Rathbun, R. E. (1998). Transport, behavior, and fate of volatile organic compounds in streams.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	29959			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene			
Confidentiality, Type, Guideline	No; Experimental; Experimental			
Solvent, Reactivity, Storage, Stability	Not Reported; Not Reported; Not Reported; Not Reported			
Radiolabel, Source, State, Purity	Not Reported; Not Reported; Not Reported; Not Reported			
Test Method Details, Test Condition Details, and Test Consistency	Gas scavenging describes gaseous organic compounds partitioning to precipitation and fall to a land or water surface or the concentrations of organic compound in the precipitation divided by the concentration in the air.; Not Reported; Not Reported			
Details				
System Type Design	Not Reported			
Sampling Frequency and Sampling Details	Not Reported; Not Reported			
Test Temperature	11°C			
Results Details	Gas scavenging ratio (Wg) = 44±not determined			
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 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	Medium	Not reported in this secondary source; the source cited likely contains more detail.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Not reported in this secondary source; the source cited likely contains more detail.
	Metric 4:	Test Substance Stability	N/A	Not reported in this secondary source; the source cited likely contains more detail.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	Medium	Not reported in this secondary source; the source cited likely contains more detail.
	Metric 6:	Testing Conditions	Medium	Not reported in this secondary source; the source cited likely contains more detail.
	Metric 7:	Testing Consistency	Medium	Not reported in this secondary source; the source cited likely contains more detail.
	Metric 8:	System Type and Design	Medium	Not reported in this secondary source; the source cited likely contains more detail.
Domain 4: Test Organisms	Metric 9:	Outcome Assessment Methodology	N/A	This metric is not applicable to this type of study.
	Metric 10:	Sampling Methods	N/A	This metric is not applicable to this type of study.
Domain 5: Outcome Assessment				
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Study Citation:	Rathbun, R. E. (1998). Transport, behavior, and fate of volatile organic compounds in streams.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	29959			
Domain		Metric	EVALUATION Rating	Comments
	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	Not reported in this secondary source; the source cited likely contains more detail.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Not reported in this secondary source; the source cited likely contains more detail.
	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	Medium	Not reported in this secondary source; the source cited likely contains more detail.
	Metric 16:	Statistical Methods and Kinetic Calculations	Medium	Not reported in this secondary source; the source cited likely contains more detail.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	Not reported in this secondary source; the source cited likely contains more detail.
	Metric 18:	QSAR Models	N/A	This metric is not applicable to this type of study.

Overall Quality Determination**Medium**

* Related References: Citing Pankow, J.F., Isabell, L.M., and Asher, W.E., 1984, Trace organic compounds in rain—!, Sampler design and analysis by adsorption/thermal desorption (ATD): Environmental Science and Technology, v. 18, no. 5, p. 310-318. HERO ID 32854.

Study Citation:	Reinhart, D. R., Pohland, F. G., Stevens, D. K. (1991). Mathematical fate modeling of hazardous organic pollutants during codisposal with municipal refuse. Hazardous Waste and Hazardous Materials 8(1):85-97.
OECD Harmonized Template:	Miscellaneous
HERO ID:	5281966

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
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	Test chemicals were added to a column packed with autoclaved municipal refuse. The column was purged with nitrogen and deaerated water was added to the column every day.; Maintained dark conditions, municipal refuse from Dekalb County SanitationDepartment after shredding at the Buford Highway Pulverization Plant in Atlanta, GA; Not applicable
System Type Design	Flow through column
Sampling Frequency and Sampling Details	Leachate was analyzed for total alkalinity, oxidation-reduction potential and volatile fatty acids biweekly; COD weekly, pH daily, aqueous organic test compound analysis three times per week and gas headspace analysis weekly.; Not applicable
Test Temperature	20°C
Results Details	1% volatilized, 2% leached and 97% retained in the column
Analytical Method and Analytical Details	GC-FID; extraction recovery or efficiency not reported
Transformation Products, Statistics, and Kinetics	Not evaluated in this study; NR for experimental studies; NR for experimental studies
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.
	Metric 2:	Test Substance Purity	Low	Test substance source and purity were not reported nor verified by analytical techniques.
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	High	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	Testing conditions were reported and appropriate.
	Metric 7:	Testing Consistency	Medium	Test conditions across samples or study groups were not reported.
	Metric 8:	System Type and Design	High	The system type and design were capable of appropriately maintaining substance concentrations.
Domain 4: Test Organisms				

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Study Citation:	Reinhart, D. R., Pohland, F. G., Stevens, D. K. (1991). Mathematical fate modeling of hazardous organic pollutants during codisposal with municipal refuse. Hazardous Waste and Hazardous Materials 8(1):85-97.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5281966			
		EVALUATION		
Domain	Metric	Rating	Comments	
	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	High	The outcome assessment methodology addressed the intended outcome of interest.
	Metric 12:	Test Substance Purity	Medium	Details regarding sampling methods were not fully reported, however, the omissions were not likely to have a substantial impact on study results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Sources of variability and uncertainty in the measurements were not considered or accounted for in data evaluation 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	Medium	Extraction efficiency was not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical analysis or kinetic calculations were clearly described.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Medium	The study results were reasonable; however, data from a reference substance was not available for comparison.
	Metric 18:	QSAR Models	N/A	This metric does not apply to this type of study.
Overall Quality Determination		High		

Study Citation:	Sproule, J. W., Shiu, W. Y., Mackay, D., Schroeder, W. H., Russell, R. W., Gobas, F. A. P.,C (1991). Direct in situ sensing of the fugacity of hydrophobic chemicals in natural waters. Environmental Toxicology and Chemistry 10(1):9-20.
OECD Harmonized Template:	Miscellaneous
HERO ID:	5237037

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; Experimental
Solvent, Reactivity, Storage, Stability	Aqueous solution; NR; NR; NR
Radiolabel, Source, State, Purity	NA; Foxboro/Analabs; Liquid; NR Notes: 20L prepared by passing the chemical through a generator column (Chromosorb W impregnated with the chemical) to ensure the chemical was fully in the solution
Test Method Details, Test Condition Details, and Test Consistency	20 L aqueous solution containing the test substance entered the continuous flow water sparger (340 mL/min solution; 240 mL/min air flow). Sparger equipped with hexane trap at the top of the device to collect volatilized substances.; Laboratory study.; Replicates NR
Details	
System Type Design	Continuous flow sparger: device submerged in water, air and water flow through the device, water outflow can be collected, air outflow passes through hexane trap at top of device.
Sampling Frequency and Sampling Details	Not reported; Water outflow collected and analyzed, hexane trap analyzed for volatilized substances
Test Temperature	25±1°C
Results Details	Ca/Cw: 0.077 Outflow water not significantly lower than entering water, 75% of test substance detected in first hexane trap, 25% of test substance in second hexane trap.
Analytical Method and Analytical Details	HP 5790A gas chromatograph with 63Ni-electron capture detector; Water outflow extracted 2x with 200 mL hexane, concentrated by evaporation; hexane trap concentrated to 1 - 2 mL by evaporation
Transformation Products, Statistics, and Kinetics	Not applicable; ±0.006; Not applicable
Reference Substance and Reference	Reference value reported by Mackay and Shiu; Kaw: 0.065
Substance Results	

EVALUATION

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
	Metric 1: Test Substance Identity	High	Test substance identified by name.
	Metric 2: Test Substance Purity	Medium	The test substance purity was not reported.
Domain 2: Test Design			
	Metric 3: Study Controls	N/A	Concurrent controls not required for air-water partition studies.
	Metric 4: Test Substance Stability	High	Test substance homogeneity and preparation was 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 appropriate test conditions were reported for the test method.
	Metric 7: Testing Consistency	High	Test conditions were consistent across study groups and were therefore assumed to be consistent across replicates.

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Study Citation:	Sproule, J. W., Shiu, W. Y., Mackay, D., Schroeder, W. H., Russell, R. W., Gobas, F. A. P.,C (1991). Direct in situ sensing of the fugacity of hydrophobic chemicals in natural waters. Environmental Toxicology and Chemistry 10(1):9-20.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5237037			
Domain		Metric	EVALUATION	
			Rating	Comments
	Metric 8:	System Type and Design	High	The system was capable of maintaining test substance concentrations and was assumed to establish equilibrium.
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 methods addressed the outcomes of interest and use widely accepted methods.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Variability was accounted for between replicates and between the measured value and the reference value.
	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 analytical method was suitable for detecting the test substance, however detection limits, extraction efficiency, and target chemical concentrations were not reported.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Statistical methods were applied appropriately, partition calculations were well described.
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:	Staley, C. S., Case, M. J. (1987). An evaluation of in situ microcosms for validating aquatic fate and transport models. Environmental Monitoring and Assessment 8(2):103-112.
OECD Harmonized Template:	Miscellaneous
HERO ID:	4912320

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; Experimental
Solvent, Reactivity, Storage, Stability	Acetone; NR; NR; NR
Radiolabel, Source, State, Purity	NA; NR; NR; NR Notes: Mixed with water in a 50-L carboy and pumped out from a slow moving boat in the pond. Rhodamine WT dye was also dispersed to determine degree of mixing, however the test substance's short half-life prevented this determination.
Test Method Details, Test Condition Details, and Test Consistency Details	Microcosms created in industrial waste pond at the Argonne National Laboratory West, near Idaho Falls, Idaho, to study test substance disappearance rates; Pond receives cooling tower blowdown water from nuclear plant at 6 - 14 m ³ /hrPond surface area: 8800 m ² Pond depth: 1.5 mPond sediments: 92% sand and silt, 8% clay, 3% total organic carbonAverage wind speed: 1.7 m/s; 27 microcosms installed; initial concentration 100 ug/L
System Type Design	Microcosms constructed of 1.5 m Pyrex pipe (diameter of 15.2 cm), pipes placed vertically in 25 cm pond sediment, extending 25 cm above water surface (1 m, 18 L water in the column), wind-mixing simulated by anemometer turning submerged propeller
Sampling Frequency and Sampling Details	3 samples collected per 9 sampling rounds over 25 to 250 hrs; 6/9 sample rounds combined for a composite sample; Water samples pumped into sample bottles by peristaltic pump and stored on ice; sediments sampled and analyzed but results reported as inconclusive
Test Temperature	Not reported
Results Details	Decay least square regression equation: $y = 3.74 - 0.0064x$ where x = time and y = ln concentration of the test substance (µg/L)Microcosms not successful in simulating pond for volatilization loss
Analytical Method and Analytical Details	GC/EC; Not reported
Transformation Products, Statistics, and Kinetics	Not reported; R ² = 83.4; 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 name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	Medium	Thorough mixing could not be verified due to the substance's short half-life.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6:	Testing Conditions	Low	Little to no testing conditions were reported; sediment characteristics were reported however sediment data analysis was not presented.
	Metric 7:	Testing Consistency	High	Test systems were created and sampled consistently.

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Study Citation:	Staley, C. S., Case, M. J. (1987). An evaluation of in situ microcosms for validating aquatic fate and transport models. Environmental Monitoring and Assessment 8(2):103-112.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	4912320			
EVALUATION				
Domain		Metric	Rating	Comments
	Metric 8:	System Type and Design	N/A	Not applicable.
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	Medium	The outcome assessment did not include sediment analysis in disappearance and reasons for its exclusion were not given.
	Metric 12:	Test Substance Purity	High	Sample methods were appropriate, Frequency was appropriate.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Many study details were not included and explanations for sediment exclusion were not reported.
	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, extraction recovery, or limits of detection were not reported. Raw data reported graphically, ln transformed.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Least squares regression was applied appropriately.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	The study omitted many details (environmental conditions, analytical methods) and did not discuss further why sediment analysis was "inconclusive".
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.
Overall Quality Determination			Medium	

Study Citation:	Staley, C. S., Case, M. J. (1987). An evaluation of in situ microcosms for validating aquatic fate and transport models. Environmental Monitoring and Assessment 8(2):103-112.
OECD Harmonized Template:	Miscellaneous
HERO ID:	4912320

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; Experimental
Solvent, Reactivity, Storage, Stability	Acetone; NR; NR; NR
Radiolabel, Source, State, Purity	NA; NR; NR; NR Notes: Mixed with water in a 50-L carboy and pumped out from a slow moving boat in the pond. Rhodamine WT dye was also dispersed to determine degree of mixing, however the test substance's short half-life prevented this determination.
Test Method Details, Test Condition Details, and Test Consistency Details	Samples collected from industrial waste pond at the Argonne National Laboratory West, near Idaho Falls, Idaho, to study test substance disappearance rates; starting concentrations used as inputs for EPA's EXAMS (Exposure Analysis Modeling System); Pond receives cooling tower blowdown water from nuclear plant at 6 - 14 m ³ /hrPond surface area: 8800 m ² Pond depth: 1.5 mPond sediments: 92% sand and silt, 8% clay, 3% total organic carbonAverage wind speed: 1.7 m/s; 15 stations sampled; initial concentration 100 ug/L; Inputs for model include physical, chemical, and biological data from literature.
System Type Design	Not applicable
Sampling Frequency and Sampling Details	Over 25 to 250 hrs; Samples composited from 5 stations; Water samples pumped into sample bottles by peristaltic pump and stored on ice; sediments sampled and analyzed but results reported as inconclusive
Test Temperature	Not reported
Results Details	Decay least square regression equationsPond: $y = 3.97 - 0.0135x$ EXAMS: $y = 3.72 - 0.0106x$ where x = time and y = ln concentration of the test substance (µg/L)
Analytical Method and Analytical Details	GC/EC; Not reported
Transformation Products, Statistics, and Kinetics	Not reported; R ² = 98.3 (pond), 99.9 (EXAMS); Model agrees with pond observations however slopes of decay curves significantly different; Pseudo first-order rate constants calculated by EXAMSHydrolysis: 0.000 / hrVolatilization: 1.034E-2 / hrTransport: 2.417E-3 / hr
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 name.
	Metric 2:	Test Substance Purity	Medium	The test substance source and purity were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	Controls were not explicitly included.
	Metric 4:	Test Substance Stability	Medium	Thorough mixing could not be verified due to the substance's short half-life.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6:	Testing Conditions	Low	Little to no testing conditions were reported; sediment characteristics were reported however sediment data analysis was not presented.
	Metric 7:	Testing Consistency	High	Test systems were created and sampled consistently.
	Metric 8:	System Type and Design	N/A	Not applicable.

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Study Citation:	Staley, C. S., Case, M. J. (1987). An evaluation of in situ microcosms for validating aquatic fate and transport models. Environmental Monitoring and Assessment 8(2):103-112.				
OECD Harmonized Template:	Miscellaneous				
HERO ID:	4912320				
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	Medium	The outcome assessment did not include sediment analysis in disappearance and reasons for its exclusion were not given.	
	Metric 12:	Test Substance Purity	High	Sample methods were appropriate, Frequency was appropriate.	
Domain 6: Confounding/Variable Control					
	Metric 13:	Confounding Variables	Medium	Many study details were not included and explanations for sediment exclusion were not reported.	
	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, extraction recovery, or limits of detection were not reported. Raw data reported graphically, ln transformed.	
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Least squares regression was applied appropriately. Model described elsewhere.	
Domain 8: Other					
	Metric 17:	Verification or Plausibility of Results	Low	The study omitted many details (environmental conditions, analytical methods) and did not discuss further why sediment analysis was "inconclusive".	
	Metric 18:	QSAR Models	N/A	The metric is not applicable to this study type.	
Overall Quality Determination			Medium		

Study Citation:	Tansel, B., Eyma, R. R. (1999). Volatile organic contaminant emissions from wastewater treatment plants during secondary treatment. Water, Air, and Soil Pollution 112(3-4):3-4.
OECD Harmonized Template:	Miscellaneous
HERO ID:	2310704

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene
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	Model prediction of activated sludge process and factors affecting VOC emissions from secondary treatment facilities in order to estimate VOC emissions from municipal wastewater treatment plants; Based on general mass balance, mass transport flow rate of influent stream through aeration unit, clarifier, and weir, and the role of volatilization, biodegradation and adsorption; Not reported
System Type Design	Measured data from North Regional Wastewater Treatment Plant in Broward County, Florida was used for model verification
Sampling Frequency and Sampling Details	Not reported; Not reported
Test Temperature	Not reported
Results Details	Liquid phase concentrations of 1,4-DCB in influent ca. 7 µg/L and effluent ca. 1.2 µg/L and based on modeling the predicted effluent was ca. 1.8 µg/L. Relative magnitude of emissions predicted from aerator = ca. 9,000 µg/s, clarifier = ca. 10,000 µg/s, and weir = ca. 17,000 µg/s
Analytical Method and Analytical Details	Not reported; Not reported
Transformation Products, Statistics, and Kinetics	Not reported; The model was developed and verified using Borland International's QUATTRO PRO 3.0 spreadsheet software.; 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	Medium	The test substance was identified by name; typo in the acronym DCP.
	Metric 2:	Test Substance Purity	Medium	Source and purity of analytical standards were not reported.
Domain 2: Test Design	Metric 3:	Study Controls	N/A	This metric is not applicable to this type of study.
	Metric 4:	Test Substance Stability	N/A	This metric is not applicable to this type of study.
Domain 3: Test Conditions	Metric 5:	Test Method Suitability	N/A	This metric is not applicable to this type of study.
	Metric 6:	Testing Conditions	High	Testing conditions/model parameters were reported.
	Metric 7:	Testing Consistency	High	This metric is not applicable to this type of study.
	Metric 8:	System Type and Design	High	This metric met the criteria of high quality for this type of study.
Domain 4: Test Organisms				

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Study Citation:	Tansel, B., Eyma, R. R. (1999). Volatile organic contaminant emissions from wastewater treatment plants during secondary treatment. Water, Air, and Soil Pollution 112(3-4):3-4.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	2310704			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 9:	Outcome Assessment Methodology	N/A	This metric is not applicable to this type of study.
	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	This metric met the criteria of medium quality for this type of study.
	Metric 12:	Test Substance Purity	N/A	This metric is not applicable to this type of study.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	This metric met the criteria of high quality for this type of study.
	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	Quantitative results can only be estimated from figures depicting numerical ranges.
	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	The results are difficult to assess based on data presented in figures.
	Metric 18:	QSAR Models	Low	Model validation lacking detail and quantitative results.
Overall Quality Determination		Medium		

Study Citation:	Topp, E., Scheunert, I., Attar, A., Korte, F. (1986). Factors affecting the uptake of carbon-14 labeled organic chemicals by plants from soil. Ecotoxicology and Environmental Safety 11(2):219-228.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	1335443			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	not reported; 1,4-Dichlorobenzene			
Confidentiality, Type, Guideline	none; experimental; experimental			
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR			
Radiolabel, Source, State, Purity	ring-labeled; synthesized; NR; >99% Notes: 14C-labeled chemicals were mixed with commercially available inactive compounds prior to soil application			
Test Method Details, Test Condition Details, and Test Consistency Details	Total 14C in plants is compared to total 14C in soils in a short-term foliar uptake study; soil adsorption coefficients were determined according to the “Screening Test” of the respective OECD guideline (OECD, 198 1 b).; 2 mg/kg 14C-labeled test substance was applied to 300 g soil; soil composition: 33.6% clay, 27.4% silt, 32.4% sand, 6.6% coarse matter, 2.06% OC, pH = 6.4.; Not reported			
System Type Design	Closed aerated apparatus			
Sampling Frequency and Sampling Details	Not reported; Not reported			
Test Temperature	Not reported			
Results Details	log Barley Root CFsoil ca. 0.65, (log soil Koc ca. 2.5); log Barley Root CFwater ca. 1.5, (log Kow ca. 3.2); Barley Root foliar uptake with volatilization from soil ca. 75% of total 14C (volatilization from soil ca. 1.7% 14C initially applied))			
Analytical Method and Analytical Details	Soxhlet extraction followed by radioactive analysis via LSC using a dioxane-based scintillation liquid; Not reported			
Transformation Products, Statistics, and Kinetics	Not reported; 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.
	Metric 2:	Test Substance Purity	High	The purity of the test substance was reported.
Domain 2: Test Design	Metric 3:	Study Controls	Uninformative	The study did not include or report crucial control groups that consequently made the study results unreliable.
	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 (temperature, duration).
	Metric 7:	Testing Consistency	Medium	Limited detail regarding this metric.
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Study Citation:	Topp, E., Scheunert, I., Attar, A., Korte, F. (1986). Factors affecting the uptake of carbon-14 labeled organic chemicals by plants from soil. Ecotoxicology and Environmental Safety 11(2):219-228.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	1335443			
Domain		Metric	EVALUATION Rating	Comments
	Metric 8:	System Type and Design	Low	The system type and design (sealed/open) were not capable or confirmed to appropriately maintain substance concentrations. Equilibrium/steady state was not established.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	Not applicable to this study.
	Metric 10:	Sampling Methods	N/A	Not applicable to this study.
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	Limited detail regarding this metric; however, the limitations were not likely to have a substantial impact on results.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	The metric is not applicable to this study.
	Metric 14:	Health Outcomes Unrelated to Exposure	N/A	The metric is not applicable to this study.
Domain 7: Data Presentation and Analysis				
	Metric 15:	Data Reporting	Low	Analytical details were omitted.
	Metric 16:	Statistical Methods and Kinetic Calculations	N/A	The metric is not applicable to this 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	A QSAR model was not reported.
Overall Quality Determination			Uninformative	

Study Citation:	Truong, K. N., Blackburn, J. W. (1984). The stripping of organic chemicals in biological treatment processes: a new approach to prediction of the fates of organic chemicals in biological processes. Environmental Progress 3(3):143-152.
OECD Harmonized Template:	Miscellaneous
HERO ID:	5257084

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; Experimental
Solvent, Reactivity, Storage, Stability	Water; NR; NR; NR
Radiolabel, Source, State, Purity	NA; NR; Crystalline dissolved in water; NA Notes: Test solution prepared by addition of the crystalline test substance and mixed with a small or magnetic stirrer in 4 L glass container, eventually reaching 50 mg/L concentration. The solution was filtered prior to usage and was completely clear.
Test Method Details, Test Condition Details, and Test Consistency Details	Test solution pumped into the reactor containing nonviable biomass from municipal sludge, purges with nitrogen before experiment start, and oxygen as introduced to determine stripping rate constants.; Air flow rate: 4 L/min; Liquid in reactor: 20 ± 3°C
System Type Design	A 6 ft high and 6 in diameter glass column with a 2.5 in 304 SS threaded pipe cap coarse bubble diffuser introducing air into the system. Three 250 mL bubblers were connected to the outlet air containing isooctane to absorb stripped test substance.
Sampling Frequency and Sampling Details	Every 10 - 20 min; Lines flushed with about 25 mL aqueous solution before collecting liquid samples. No sampling details for air samples.
Test Temperature	17.0-23.6°C
Results Details	Stripping rate equation = $K_a \cdot a \cdot C_n$ Where K_a = substrate stripping rate constant (based on aqueous phase disappearance / hr) a = interfacial area (m^2) C_n = substrate concentration in aqueous phase (mg/L)
Analytical Method and Analytical Details	Not reported; Not reported
Transformation Products, Statistics, and Kinetics	Not applicable; Not reported; Stripping rate constant: 0.91 / hr Reaeration rate constant: 16.8 / hr
Reference Substance and Reference Substance Results	Material; 129%

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 and purity were reported.
Domain 2: Test Design			
	Metric 3: Study Controls	Medium	A concurrent control was not explicitly reported.
	Metric 4: Test Substance Stability	High	Test substance preparation was described in detail and addressed concerns with low solubility.
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 were monitored and reported.
	Metric 7: Testing Consistency	High	Test conditions were consistent across study groups.

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Study Citation:	Truong, K. N., Blackburn, J. W. (1984). The stripping of organic chemicals in biological treatment processes: a new approach to prediction of the fates of organic chemicals in biological processes. Environmental Progress 3(3):143-152.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5257084			
Domain		Metric	EVALUATION	
			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 intended outcomes of interest.
	Metric 12:	Test Substance Purity	High	Sampling methods address the outcomes of interest and used appropriate collection methods and frequency.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Potential sources of variability were discussed in the study.
	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 methods were not reported in the study
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were described in depth and appropriate.
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:	Truong, K. N., Blackburn, J. W. (1984). The stripping of organic chemicals in biological treatment processes: a new approach to prediction of the fates of organic chemicals in biological processes. Environmental Progress 3(3):143-152.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5257084			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-DCB			
Confidentiality, Type, Guideline	None; Experimental; Experimental			
Solvent, Reactivity, Storage, Stability	Water; NR; NR; NR			
Radiolabel, Source, State, Purity	NA; NR; Crystalline dissolved in water; NA Notes: Test solution prepared by addition of the crystalline test substance and mixed with a small or magnetic stirrer in 4 L glass container, eventually reaching 50 mg/L concentration. The solution was filtered prior to usage and was completely clear.			
Test Method Details, Test Condition Details, and Test Consistency Details	Test solution pumped into the reactor containing nonviable biomass from municipal sludge, purges with nitrogen before experiment start, and oxygen as introduced to determine stripping rate constants.; Air flow rate: 2 L/min; Liquid in reactor: 20 ± 3°C			
System Type Design	A 6 ft high and 6 in diameter glass column with a 2.5 in 304 SS threaded pipe cap coarse bubble diffuser introducing air into the system. Three 250 mL bubblers were connected to the outlet air containing isooctane to absorb stripped test substance.			
Sampling Frequency and Sampling Details	Every 10 - 20 min; Lines flushed with about 25 mL aqueous solution before collecting liquid samples. No sampling details for air samples.			
Test Temperature	17.0-23.6°C			
Results Details	Stripping rate equation = $K_a \cdot a \cdot C_n$ Where K_a = substrate stripping rate constant (based on aqueous phase disappearance / hr) a = interfacial area (m^2) C_n = substrate concentration in aqueous phase (mg/L)			
Analytical Method and Analytical Details	Not reported; Not reported			
Transformation Products, Statistics, and Kinetics	Not applicable; Not reported; Stripping rate constant: 0.32 / hr Reaeration rate constant: 4.83 / hr			
Reference Substance and Reference Substance Results	Material; 100%			
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 and purity were reported.
Domain 2: Test Design	Metric 3:	Study Controls	Medium	A concurrent control was not explicitly reported.
	Metric 4:	Test Substance Stability	High	Test substance preparation was described in detail and addressed concerns with low solubility.
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 were monitored and 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				
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Study Citation:	Truong, K. N., Blackburn, J. W. (1984). The stripping of organic chemicals in biological treatment processes: a new approach to prediction of the fates of organic chemicals in biological processes. Environmental Progress 3(3):143-152.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5257084			
		EVALUATION		
Domain	Metric	Rating	Comments	
	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	High	Sampling methods address the outcomes of interest and used appropriate collection methods and frequency.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	High	Potential sources of variability were discussed in the study.
	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 methods were not reported in the study
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Kinetic calculations were described in depth and appropriate.
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:	Van Luin, A. B., Van Starkenburg, W. (1985). Hazardous Substances in Waste Water. Water Science and Technology 17(6-7):843–853.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5443237			
EXTRACTION				
Parameter	Data			
CASRN and Test Material	106-46-7; 1,4-Dichlorobenzene			
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	Six WWTPs evaluated, treatment processes included oxidation ditch, activated sludge, trickling filter; flow (mean year values) ranged from 1.700-44.800 m3/d; Data from 6 treatment plants were averaged			
Details				
System Type Design	Six municipal Waste Water Treatment Plants influent/ effluent concentrations ug/L: A: <5/<5, B: <5/<5, C: <5/<5, D: <5/<5, E: <5/<5, F: <5/<5			
Sampling Frequency and Sampling Details	Not reported; The influent, effluent and sludge of each treatment plant was sampled seven times; 1 sample was collected for this substance; sludge was not monitored for volatile chlorinated hydrocarbons due to variation in influents			
Test Temperature	Not reported			
Results Details	Percent removal in six municipal waste water treatment plants: Mean: >72%Number of samples: 1			
Analytical Method and Analytical Details	The volatile chlorinated hydrocarbons substances were analyzed via CGC/ECD; Not reported			
Transformation Products, Statistics, and Kinetics	Not reported; 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 definitively.
	Metric 2:	Test Substance Purity	High	Analytical reference substance details not reported.
Domain 2: Test Design				
	Metric 3:	Study Controls	N/A	This metric is not applicable to this type of study.
	Metric 4:	Test Substance Stability	N/A	This metric is not applicable to this type of study.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	High	The test method was suitable.
	Metric 6:	Testing Conditions	Low	Limited detail on operating conditions of treatment plants.
	Metric 7:	Testing Consistency	N/A	This metric is not applicable to this type of study.
	Metric 8:	System Type and Design	N/A	This metric is not applicable to this type of study.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric is not applicable to this type of study.
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Study Citation:	Van Luin, A. B., Van Starkenburg, W. (1985). Hazardous Substances in Waste Water. Water Science and Technology 17(6-7):843–853.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	5443237			
Domain		Metric	EVALUATION Rating	Comments
	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	High	The outcome was addressed.
	Metric 12:	Test Substance Purity	Low	Limited detail on sampling methods.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	N/A	This metric is not applicable to this type of study.
	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 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			Medium	

Study Citation:	Wania, F. (1997). Modelling the fate of non-polar organic chemicals in an ageing snow pack. Chemosphere 35(10):2345-2363.
OECD Harmonized Template:	Miscellaneous
HERO ID:	3267482

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; calculation; calculation
Solvent, Reactivity, Storage, Stability	NA; NA; NA; NA
Radiolabel, Source, State, Purity	NA; NA; NA; NA
Test Method Details, Test Condition Details, and Test Consistency Details	Step-wise model of chemical behavior in snow pack developed to determine partitioning and loss of the test substance during settling, firnification, and melting of snow.; Equilibrium partitioning calculated considering air, liquid water, organic carbon, and ice-air interface. Loss calculated considering volatilization and draining melt water.; Organic material in snow pack: 1E-8 m ³ organic carbon/m ² snow covered ground. Snow settling period: 10 days; Firnification (Snow to ice conversion) period: 355 days; Snow melting period: 10 days.
System Type Design	Snow settling: surface area decreases exponentially 1 to 0.1 m ² /g, density increases 50 to 500 kg/m ³ Firnification: surface area decreases linearly 0.01m ² /g, density increases to 800 kg/m ³ Snow melting: density is 0.5 t/m ³ , surface area 0.1 m ² /g
Sampling Frequency and Sampling Details	Not applicable; Not applicable
Test Temperature	Snow settling and firnification: - 5°C Snow melting: linear increase from -5°C to 0°C
Results Details	After deposition: 26.84% air, 72.89% interface, 0.27% water, 0.00% organic carbon; After settling: 0.00% air, 0.00% interface, 0.00% water, 0.00% organic carbon, 100.00% volatilized. Found as up to 27% vapor in pore space of snow, all compound lost by volatilization within 10d snow settling phase.
Analytical Method and Analytical Details	Equilibrium fugacity = $M_{sp} / (Z_a * V_a + Z_l * V_l + z_i * A_i + Z_o * V_o)$ M_{sp} = amount of chemical in snow pack $V_{a,l,o}$ = air, liquid, organic carbon volume A_i = area snow-air interface Z = partition capacity $Z_a = 1/RT$ $Z_l = K_{wa}/Z_a$ $Z_o = Z_l * 0.41 * K_{ow}$ $z_i = k_{ia}/Z_a$; Chemical loss = $M_{sp}(t+1) = M_{sp}(t) - (M_{cl}(t) + M_{dl}(t))$ M_{vl} = volatilization loss = $D_{vl} * f * dt$ M_{dl} = drainage loss = $D_{dl} * f * dt$ D value volatilization based on calculation of D value for volatilization from soil; D value melt loss assumes no particles
Transformation Products, Statistics, and Kinetics	Not applicable; 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 name.
	Metric 2: Test Substance Purity	N/A	Not applicable for calculations.
Domain 2: Test Design			
	Metric 3: Study Controls	N/A	Not applicable for calculations.
	Metric 4: Test Substance Stability	N/A	Not applicable for calculations.
Domain 3: Test Conditions			
	Metric 5: Test Method Suitability	High	The method was suitable for the test substance.
	Metric 6: Testing Conditions	High	Calculation inputs were reported and appropriate.

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Study Citation:	Wania, F. (1997). Modelling the fate of non-polar organic chemicals in an ageing snow pack. Chemosphere 35(10):2345-2363.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	3267482			
Domain		Metric	EVALUATION Rating	Comments
	Metric 7:	Testing Consistency	High	Calculations were consistent across study groups.
	Metric 8:	System Type and Design	N/A	Not applicable for calculations.
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	N/A	Not applicable for calculations.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Medium	Uncertainty in calculations was discussed briefly.
	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	Percentage calculated was reported for all compartments.
	Metric 16:	Statistical Methods and Kinetic Calculations	High	Calculations were described in depth and appropriate.
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:	Webber, M. D., Goodin, J. D. (1992). The persistence of VOCs PAHs PCBs and phthalates in sludge-treated soil. Canadian Journal of Soil Science 72(3):348.
OECD Harmonized Template:	Miscellaneous
HERO ID:	1333567

EXTRACTION	
Parameter	Data
CASRN and Test Material	106-46-7; 1,4-dichlorobenzene and 1,1-dichloroethane
Confidentiality, Type, Guideline	no; not specified; not specified
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR Notes: mixture of 10 volatile organic contaminants including 1,1-dichloroethane and 1,4dichlorobenzene
Test Method Details, Test Condition Details, and Test Consistency Details	NR; NR; NR
System Type Design	NR
Sampling Frequency and Sampling Details	NR; NR
Test Temperature	NR
Results Details	first-order disappearance half-lives ranged from 1 to 949 h
Analytical Method and Analytical Details	NR; NR
Transformation Products, Statistics, and Kinetics	NR; NR; NR
Reference Substance and Reference Substance Results	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	Low	Not reported in this source.
Domain 2: Test Design				
	Metric 3:	Study Controls	Low	Not reported in this source.
	Metric 4:	Test Substance Stability	Low	Not reported in this source.
Domain 3: Test Conditions				
	Metric 5:	Test Method Suitability	Low	Not reported in this source.
	Metric 6:	Testing Conditions	Low	Not reported in this source.
	Metric 7:	Testing Consistency	Low	Not reported in this source.
	Metric 8:	System Type and Design	Low	Not reported in this source.
Domain 4: Test Organisms				
	Metric 9:	Outcome Assessment Methodology	N/A	This metric does not apply to this study type.

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Study Citation:	Webber, M. D., Goodin, J. D. (1992). The persistence of VOCs PAHs PCBs and phthalates in sludge-treated soil. Canadian Journal of Soil Science 72(3):348.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	1333567			
		EVALUATION		
Domain	Metric	Rating	Comments	
	Metric 10:	Sampling Methods	N/A	This metric does not apply to this study type.
Domain 5: Outcome Assessment				
	Metric 11:	Test Substance Identity	Low	Not reported in this source.
	Metric 12:	Test Substance Purity	Low	Not reported in this source.
Domain 6: Confounding/Variable Control				
	Metric 13:	Confounding Variables	Low	Not reported in this source.
	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	Low	Not reported in this source.
	Metric 16:	Statistical Methods and Kinetic Calculations	Low	Not reported in this source.
Domain 8: Other				
	Metric 17:	Verification or Plausibility of Results	Low	Not reported in this source.
	Metric 18:	QSAR Models	N/A	This metric does not apply to this study type.
Overall Quality Determination		Low		

* Related References: Source is only an abstract.

Study Citation:	Wilson, J. T., Enfield, C. G., Dunlap, W. J., Cosby, R. L., Foster, D. A., Baskin, L. B. (1981). Transport and fate of selected organic pollutants in a sandy soil. Journal of Environmental Quality 10(4):501-506.
OECD Harmonized Template:	Miscellaneous
HERO ID:	3797830

EXTRACTION

Parameter	Data
CASRN and Test Material	106-46-7; 1,4-DCB
Confidentiality, Type, Guideline	None; Experimental; Experimental
Solvent, Reactivity, Storage, Stability	Water; NR; Feed solution kept on ice, in a Teflon gas-sampling bag with a Teflon septum valve; NR
Radiolabel, Source, State, Purity	NR; NR; NR; NR
Test Method Details, Test Condition Details, and Test Consistency Details	Fate and transport of selected pollutants were studied in a column system representing sandy soil overlying groundwater; Test substance applied at 0.80 and 0.13 mg/L for 45 d; Steady state reached after 25 dColumns received 14 cm water per dayAir delivered to headspace at pressure of 2 cm of water; 12 mL/min air removed from headspace; Three replicate columns.Soil: sandy soil, pH 6.4, CEC 3.5, 92% sand, 5.9% silt, 2.1% clay, 0.087% organic carbonColumn bulk density: 1.65 g/cm ³ Column hydraulic conductivity: 120 to 190 cm/dSpring water: pH 7.2, HCO ₃ ⁻ alkalinity 513 ppm
System Type Design	Borosilicate glass process column (5 cm i.d by 150 cm), packed with soil to a depth of 140 cm, connected at the top to a trap for volatile compounds, influent for dry air, and connection to feed solution; at the bottom, end plug effluent to sample
Sampling Frequency and Sampling Details	Not reported; Aqueous effluent and trapped volatiles analyzed
Test Temperature	20 ± 1°C
Results Details	Volatilized: Not determinedColumn effluent (high, low concentration): 37±4%, 49±10%Degraded or not accounted for (high, low concentration): 63± 4%, 51±10%Retardation factor (high, low concentration: 3.4±0.3, 3.7±0.4
Analytical Method and Analytical Details	GC-FID; Samples transferred to liquid sample concentrator, volatiles purged and trapped. Aqueous samples extracted 3x into methylene chloride, dried with anhydrous Na ₂ SO ₄ and concentrated; Extraction efficiency: 49-98% (volatiles), 58-74% (aqueous)
Transformation Products, Statistics, and Kinetics	Not reported; Not reported; Not reported
Reference Substance and Reference Substance Results	Column receiving spring water alone; 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 and purity were not reported.
Domain 2: Test Design			
	Metric 3: Study Controls	High	A negative control was included, the results of which were not reported but assumed to be within an acceptable range.
	Metric 4: Test Substance Stability	High	Test substance preparation and storage was 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	Soil and water characteristics were reported, temperature was reported.

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Study Citation:	Wilson, J. T., Enfield, C. G., Dunlap, W. J., Cosby, R. L., Foster, D. A., Baskin, L. B. (1981). Transport and fate of selected organic pollutants in a sandy soil. Journal of Environmental Quality 10(4):501-506.				
OECD Harmonized Template:	Miscellaneous				
HERO ID:	3797830				
Domain		Metric	EVALUATION		
			Rating	Comments	
		Metric 7:	Testing Consistency	High	Test conditions were consistent across study groups.
		Metric 8:	System Type and Design	High	The system was capable of maintaining test substance concentrations and equilibrium was established.
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 methods were appropriate.
Domain 6: Confounding/Variable Control					
		Metric 13:	Confounding Variables	High	Variation between replicates was accounted for via statistical techniques.
		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 method was appropriate, extraction efficiencies were reported, mass balance was accounted for.
		Metric 16:	Statistical Methods and Kinetic Calculations	N/A	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:	Yager, T. J. B., Furlong, E. T., Kolpin, D. W., Kinney, C. A., Zaugg, S. D., Burkhardt, M. R. (2014). Dissipation of contaminants of emerging concern in biosolids applied to nonirrigated farmland in eastern Colorado. Journal of the American Water Resources Association 50(2):343-357.
OECD Harmonized Template:	Miscellaneous
HERO ID:	2346027

EXTRACTION	
Parameter	Data
CASRN and Test Material	NR; 1,4-Dichlorobenzene
Confidentiality, Type, Guideline	None; Experimental; Experimental
Solvent, Reactivity, Storage, Stability	NR; NR; NR; NR
Radiolabel, Source, State, Purity	NR; biosolids; NR; NR Notes: 180 day weathered biosolids
Test Method Details, Test Condition Details, and Test Consistency Details	Agronomic biosolids were applied to nonirrigated farmland and sampled. Dewatered municipal biosolids resulting from secondary treatment May 2-7, 2007; biosolids were partially incorporated in the soil using a rotating, tractor-pulled aerator. A crop of winter wheat was planted four months after biosolids were applied and harvested after 14 months.; The study area was in the eastern plains of Colorado, northeast of Denver.; Variability found for analytes discussed in the supporting information file
System Type Design	crop field study with regular sampling
Sampling Frequency and Sampling Details	-7, 3, 17, 41, 90, 180 days post biosolid application; Weathered biosolids were collected from the land surface at 17, 41, 90, and 180 days post-application, separated from the soil. Soil was sampled seven days prior to biosolids. Soil sampling at each selected sampling node, 0-126 cm below land surface, sampled as seven separate vertical depth increments.
Test Temperature	NA
Results Details	Highest value detected in biosolid (2940 ug/kg, est.), soil (<65 ug/kg) and crop (<400 ug/kg). Authors noted that some monitored substances persisted in surface biosolids while others migrated or dissipated rapidly by various mechanisms. 1,4-Dichlorobenzene's behavior, although concentrations were included in the supplemental information, it was not included in the discussion and is unclear if it was rapidly dissipated.
Analytical Method and Analytical Details	GC/MS; Biosolids and soil samples analyzed using pressurized solvent extraction, solid phase extraction, and capillary-column gas chromatography/mass spectrometry; crop samples measured with a modification of method from Burkhardt et al. (2006)
Transformation Products, Statistics, and Kinetics	NR; Not Reported; NR
Reference Substance and Reference Substance Results	laboratory blank, spiked samples, internal standards and continuing calibration verification samples were analysed; reported in supporting information files

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	High	The source of the test substance was reported and purity were verified by analytical means.
Domain 2: Test Design	Metric 3:	Study Controls	High	A concurrent negative control, or blank group, toxicity control, and positive control were included.
	Metric 4:	Test Substance Stability	N/A	This metric is not applicable to this study type.
Domain 3: Test Conditions				

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Study Citation:	Yager, T. J. B., Furlong, E. T., Kolpin, D. W., Kinney, C. A., Zaugg, S. D., Burkhardt, M. R. (2014). Dissipation of contaminants of emerging concern in biosolids applied to nonirrigated farmland in eastern Colorado. Journal of the American Water Resources Association 50(2):343-357.			
OECD Harmonized Template:	Miscellaneous			
HERO ID:	2346027			
Domain	Metric	EVALUATION		Comments
	Metric 5:	Test Method Suitability	Medium	The test method was suitable for the test substance and nominal estimates of media concentrations were provided, these deviations or omissions were not likely to have a substantial impact on study results
	Metric 6:	Testing Conditions	Medium	There were reported deviations or omissions in testing conditions and variability in the samples.
	Metric 7:	Testing Consistency	High	Test conditions were consistent across samples or study groups.
	Metric 8:	System Type and Design	Medium	The system type and design were not capable of appropriately maintaining substance concentrations or not described but the deviation was not likely to have a substantial impact on study results.
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	Medium	There were minor differences between the assessment methodology and the intended outcome assessment, estimates were reported for many values.
	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	Medium	Sources of variability and uncertainty in the measurements and statistical techniques and between study groups (if applicable) were reported in the study and the minor deviations or omissions were not likely to have a substantial impact on 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	Low	Dissipation could be attributed to various processes and analysis and discussion did not include all monitored substances. This makes it difficult to form conclusions on all substances analyzed.
	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	The metric is not applicable to this study type.

Overall Quality Determination**Medium**

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Study Citation:	Yager, T. J. B., Furlong, E. T., Kolpin, D. W., Kinney, C. A., Zaugg, S. D., Burkhardt, M. R. (2014). Dissipation of contaminants of emerging concern in biosolids applied to nonirrigated farmland in eastern Colorado. Journal of the American Water Resources Association 50(2):343-357.
OECD Harmonized Template:	Miscellaneous
HERO ID:	2346027

		EVALUATION	
Domain	Metric	Rating	Comments

* Related References: Supporting information files were used to review the data and perform the evaluation.

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	Quantitative 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