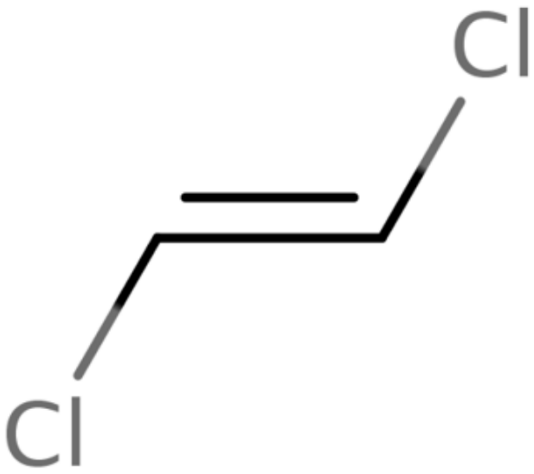
United States
Environmental Protection Agency

July 2026
Office of Chemical Safety and
Pollution Prevention

# Draft Data Quality Evaluation and Data Extraction Information for Environmental Fate and Transport for *trans*-1,2-Dichloroethylene

# Systematic Review Support Document for the Draft Risk Evaluation

**CASRN: 156-60-5**




***July 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 trans-1,2-Dichloroethylene* 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 trans-1,2-Dichloroethylene*. 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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| **Study Citation:** | Belpoggi, F., Chiozzotto, D., Lauriola, M. (2012). Unsaturated halogenated hydrocarbons. :129-229. |
| **OECD Harmonized Template:** | Photolysis in Air |
| **HERO ID:** | 4332198 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; trans 1,2-DCE |
| Confidentiality, Type, Guideline | None; Experimental; other: NR |
| 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 | Not Reported; 5 d; 12 d |
| Indirect Type Results, Indirect Rate Constant Lower and Upper | Not Reported; Not Reported; Not Reported |
| Method Details Results and Products Details Results | Not Reported; 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 | Not Reported; 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 and purity were not reported in the secondary source. |
| Domain 2: Test Design | | | |
| Metric 3: | Study Controls | Medium | Concurrent control group details were not reported in the secondary source. |
| Metric 4: | Test Substance Stability | Medium | Test substance stability, homogeneity, preparation, and storage conditions were not reported in the secondary source. |
| Domain 3: Test Conditions | | | |

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|---|---|
| **Study Citation:** | Belpoggi, F., Chiozzotto, D., Lauriola, M. (2012). Unsaturated halogenated hydrocarbons. :129-229. |
| **OECD Harmonized Template:** | Photolysis in Air |
| **HERO ID:** | 4332198 |

| Domain | | Metric | EVALUATION Rating | Comments |
|---|---|---|---|---|
| | Metric 5: | Test Method Suitability | Medium | Test method details were not reported in the secondary source however there is no indication that the methodology for producing the information was biased towards a particular outcome. |
| | Metric 6: | Testing Conditions | Medium | Testing conditions are unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognize d database or other secondary source. |
| | Metric 7: | Testing Consistency | Medium | Testing consistency is unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 8: | System Type and Design | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | N/A | Rating of this factor is not applicable to this kind of information. |
| | Metric 10: | Sampling Methods | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Medium | The outcome assessment methodology is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 12: | Test Substance Purity | Medium | Sampling methodology is unknown is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Sources of variability and uncertainty were not reported in the secondary source. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Medium | Limited data is reported in the secondary source but study data are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | N/A | No statistical methods or kinetic calculations were reported in the secondary source. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Medium | The results are reasonable based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 18: | QSAR Models | N/A | Rating of this factor is not applicable to this kind of information. |

## Overall Quality Determination — NEED TO FIX

* Related References: Cites a secondary source HERO ID 723873.

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|---|---|
| **Study Citation:** | Dilling, W. L., Bredeweg, C. J., Tefertiller, N. B. (1976). Organic photochemistry: Simulated atmospheric photodecomposition rates of methylene chloride, 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene, and other compounds. Environmental Science & Technology 10(4):351-356. |
| **OECD Harmonized Template:** | Photolysis in Air |
| **HERO ID:** | 59297 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-Dichloroethylene |
| Confidentiality, Type, Guideline | None; Experimental; other: Non-guideline study of photolysis under simulated atmospheric conditions. |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; Liquid; NR Notes: Free of impurities by GC analysis |
| Duration and Test Temperature | 7.0 hours; 27±1°C |
| Light Source, Intensity, and additional light details | Sunlamp; UV light intensity was ca. 2.6 times that of natural sunlight at noon on a summer day in TX; General Electric 275-W reflector sunlamp |
| Source Wavelength Lower and Upper | 290 nm; Not reported |
| Test Details and Control | relative humidity 35-40% initially, reactions run at 35% RH; gas samples analyzed periodically, the first sample taken prior to turning on lamps; Not reported |
| Initial Concentration, Reference Compound | Test material: 10 ppm in air; 5 ppm NO; 16.8 ppm ppm NO2 ppm; 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 | Photodegradation by reaction with nitric oxide NO and nitrogen dioxide NO2; Not reported; Not reported |
| Method Details Results and Products Details Results | rates of disappearance determined by GC-FID; Not reported |
| Parameter Value and Parameter Results | 2.9 hours (NO) 2.8 hours (NO2); half-life |
| Reference Substance Results, Percent Degradation Results and Standard Deviation Results | Not reported; Not reported; Not reported |
| Results Remarks, Sample time Results, Results Details | Half-life = time for 50% disappearance of compound; 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 test substance source and specific purity was not reported; however, GC confirmed test material was free from impurities. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Low | Controls are not reported; making it difficult to interpret the role of nitrogen oxides in disappearance of the test substance relative to the role of hydroxyl radicals that will be produced under the experimental conditions. |

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|---|---|
| **Study Citation:** | Dilling, W. L., Bredeweg, C. J., Tefertiller, N. B. (1976). Organic photochemistry: Simulated atmospheric photodecomposition rates of methylene chloride, 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene, and other compounds. Environmental Science & Technology 10(4):351-356. |
| **OECD Harmonized Template:** | Photolysis in Air |
| **HERO ID:** | 59297 |

| | | **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 | Low | Initial nitrogen oxide concentrations are 1-3 orders of magnitude higher than environmental concentrations. Lack of monitoring of nitrogen oxide concentrations, and likely interaction between OH radicals and nitrogen oxides, leaves significant uncertainties regarding their role in the test substance disappearance and applicability to environmentally relevant conditions. |
| | 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 | N/A | Sampling intervals were not reported but their omission was not likely to have influenced the 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 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 | Low | Statistical analysis or kinetic calculations were not described clearly. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | High | The study results were reasonable. |

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|---|---|
| **Study Citation:** | Dilling, W. L., Bredeweg, C. J., Tefertiller, N. B. (1976). Organic photochemistry: Simulated atmospheric photodecomposition rates of methylene chloride, 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene, and other compounds. Environmental Science & Technology 10(4):351-356. |
| **OECD Harmonized Template:** | Photolysis in Air |
| **HERO ID:** | 59297 |

**EVALUATION**

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

## Overall Quality Determination Low

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|---|---|
| **Study Citation:** | Dow Chemical, (1982). Environmental fate and effect of chlorinated solvents (Part C). |
| **OECD Harmonized Template:** | Photolysis in Air |
| **HERO ID:** | 1579708 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; trans-DCE |
| Confidentiality, Type, Guideline | None; Experimental; other: photochemical reactivity with NO in air |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; Eastman; NR; NR Notes: redistilled to give a center cut at 48°C |
| Duration and Test Temperature | 6-8 hours (reported as equivalent to 2-3days of intense noon-time sun for 6 hr/day); 26-28°C |
| Light Source, Intensity, and additional light details | Sunlamp; ca. 90 E-vitons/cm2; Two General Electric 275 watt reflector sunlamps |
| Source Wavelength Lower and Upper | >290 nm; Not reported |
| Test Details and Control | Reaction carried out with 35% relative humidity under atmospheric pressure; initial NO concentration = 5 ppm, NO2 = 16.8 ppm; first samples analyzed, before the lamps were turned on (dark control), were used as standards for subsequent test sample comparison; disappearance during the reaction was then determined directly from reduction in peak height or area; Dark control included |
| Initial Concentration, Reference Compound | 10 ppm; 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 Details Results | GC with FID; detection limits not determined but assumed to be 0.1 to 1 ppm or less; Not reported |
| Parameter Value and Parameter Results | % disappearance of; 50%/2.9 hours (reaction with NO); 50%/2.8 hours (reaction with NO2) |
| Reference 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 identified clearly. |
| Metric 2: | Test Substance Purity | High | The test substance source was reported and distilled prior to use. |
| Domain 2: Test Design | | | |
| Metric 3: | Study Controls | High | Dark controls were reported. |
| Metric 4: | Test Substance Stability | Low | Details regarding this metric were not reported. |

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|---|---|
| **Study Citation:** | Dow Chemical, (1982). Environmental fate and effect of chlorinated solvents (Part C). |
| **OECD Harmonized Template:** | Photolysis in Air |
| **HERO ID:** | 1579708 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | High | The test method was suitable for the test substance. |
| | Metric 6: | Testing Conditions | High | Testing conditions were reported and appropriate. |
| | Metric 7: | Testing Consistency | High | There were no inconsistencies reported in the testing conditions. |
| | 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 | Sources of uncertainty in sampling were described and 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 | Medium | Data reporting was appropriate; mass balance and recoveries were not reported. |
| | 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 | Medium | The study results are reasonable. |
| | Metric 18: | QSAR Models | N/A | The metric is not applicable to the study type. |
| **Overall Quality Determination** | | | **High** | |

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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 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; 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; 2.5; Not reported |
| Method Details Results and Products Details Results | Rate constant for OH radical addition to olefinic carbon-carbon double bonds (sp2-carbon atoms); Not reported |
| Parameter Value and Parameter Results | Not reported; Rate constant units: 10E-12 cm3/molecule/s |
| Reference Substance Results, Percent Degradation Results and Standard Deviation Results | 1.8; Not reported; s = 0.28; r-squared = 0.954 |
| 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:** | Jeffers, P. M., Ward, L. M., Woytowitch, L. M., Wolfe, N. L. (1989). Homogeneous hydrolysis rate constants for selected chlorinated methanes, ethanes, ethenes, and propanes. Environmental Science & Technology 23(8):965-969. |
| **OECD Harmonized Template:** | Hydrolysis |
| **HERO ID:** | 661098 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; 1,2-Dichloroethene (DCE) |
| Confidentiality, Type, Guideline | None; Experimental; other: Alkaline homogenous hydrolysis experiments; a range of pH and temperature evaluated. Arrhenius temperature dependence assumed. |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; Aldrich, Eastman, or Pfaltz and Bauer; NR; Highest purity available Notes: Aqueous solutions were prepared by shaking for 2 min with distilled boiled DI water |
| Buffer, Test Temperature, Number of Replicates | pH 7 phosphate buffer or dilute NaOH or HCl solutions; 140-200°C; 5-20 time-concentration points analyzed in triplicate |
| Positive Controls and Negative Controls | Positive: Not reported; Negative: Not reported |
| pH and Duration | 2-14; 30 min to several days (for all test materials; specific duration for tetrachloroethylene not specified) |
| Sampling Frequency and Test Setup | Not reported; zero dead-volume stainless steel tubes, glass bulbs drawn from 7-mm-o.d. borosilicate tubing, or zero dead-volume septum vial capped with a Teflon-lined septum |
| Concentration | Final solutions were less than 10% saturated with organic test material - |
| Analytical Method, Analytical Details, and Statistics | GC with FID, ECD, FID and/or HELCD; a number of different chromatographs, columns, and conditions were used; Details specific to TCE were not reported; r squared >0.95 |
| Transformation Products | Not reported |
| Reference Substance and Reference Substance Results | Not reported; Not reported |
| Percent Recovery, Hydrolysis Rate Constant, and Half-life | Not reported; 6.32E-17 min-1; 2.1E10 years |
| Results Remarks | Measured half-lives extrapolated to pH 7 and 25°C. Chlorinated ethenes reacted only with hydroxide under severe conditions; neutral hydrolysis was not observed |

**EVALUATION**

| Domain | Metric | Rating | Comments |
|---|---|---|---|
| Domain 1: Test Substance | | | |
| Metric 1: | Test Substance Identity | High | The test substance was identified by chemical name and CASRN. |
| Metric 2: | Test Substance Purity | Medium | The source and purity of the test substance were stated in a general manner relating to all materials in the study. |
| 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 limited but this did not limit the interpretation of the results. |
| Domain 3: Test Conditions | | | |

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|---|---|
| **Study Citation:** | Jeffers, P. M., Ward, L. M., Woytowitch, L. M., Wolfe, N. L. (1989). Homogeneous hydrolysis rate constants for selected chlorinated methanes, ethanes, ethenes, and propanes. Environmental Science & Technology 23(8):965-969. |
| **OECD Harmonized Template:** | Hydrolysis |
| **HERO ID:** | 661098 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 5: | Test Method Suitability | High | The method was suitable for the substance; test substance concentration was no higher than 10% of its water solubility limit. |
| | Metric 6: | Testing Conditions | Medium | Details regarding this metric were general but this did not limit the interpretation of the results. |
| | Metric 7: | Testing Consistency | Medium | Details regarding this metric were general but this did not limit the interpretation of the results. |
| | 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 | This metric met the criteria for high confidence as expected for this type of study. |
| | Metric 12: | Test Substance Purity | Medium | Details regarding this metric were not reported but this did not limit the interpretation of the 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 | N/A | The metric is not applicable to this study type. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Low | Details regarding the analytical procedure were very general; this may limit meaningful/precise interpretation of the 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

* Related References: ECHA rating: 2

| | |
|---|---|
| **Study Citation:** | Getoff, N. (1991). Radiation- and photoinduced degradation of pollutants in water. A comparative study. International Journal of Radiation Applications and Instrumentation. Part C. Radiation Physics and Chemistry 37(5-6):673-680. |
| **OECD Harmonized Template:** | Photolysis in Water |
| **HERO ID:** | 5434138 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-Dichloroethylene |
| Confidentiality, Type, Guideline | None; Experimental; EPA OTS 796.3700 (Direct Photolysis Rate in Water by Sunlight): Photodegradation in neutral aqueous solution in the presence of air |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; Merck; NR; NR |
| Duration and Test Temperature | Not reported; 30±1°C |
| Light Source, Intensity, and additional light details | low pressure mercury lamp: Osram HNS 10W OZ with quartz cover; 5.1E16 quanta/ml min (ozone formation used to determine intensity); at 184.9 nm E = 6.71 eV/hr; at 253.7 nm E = 4.89 eV/hr |
| Source Wavelength Lower and Upper | 184.9 nm; 253.7 nm |
| Test Details and Control | Gammacell 220 used for steady-state irradiations in aerated aqueous solutions (0.25E-3 mol/dm3 O2) at pH = ca. 6.7.; Not reported |
| Initial Concentration and Reference Compound | 1E-4 mol/dm3; Not reported |
| Substance Wavelength Lower and Upper | Not reported; 199 nm |
| Direct Quantum Yield Results, Direct Half Life by Loss Lower and Upper | initial quantum yield (Qi-value) = 6.1; Not reported; Not reported |
| Indirect Rate Constant Lower and Upper | OH radical rate constant: 3.9E9 dm3/mol second; Not reported |
| Method Details Results and Products | formation of Cl ions used as an indicator of decomposition; Cl ion yields expressed as G-values; G-value = number of decomposed or produced molecules per 100 eV absorbed energy; Not reported |
| Details Results | |
| Parameter Value and Parameter Results | 'photochemical' G-value (Gph) = 91; Photolysis/radiolysis; to equalize terms for comparison, Qi values were multiplied by a conversion factor (f) to obtain 'photochemical' G-value (Gph): f = 14.9 (184.9 nm) and 20.45 (253.7) |
| Reference Compound, Reference Substance Results, Percent Degradation Results and Standard Deviation Results | Not reported; 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 identified by name. |
| Metric 2: | Test Substance Purity | Medium | The test substance source was reported; purity was not reported. |
| Domain 2: Test Design | | | |
| Metric 3: | Study Controls | Low | Controls or reference substance were not explicitly included. |
| Metric 4: | Test Substance Stability | Medium | Test substance preparation was reported, storage conditions were not reported. |
| Domain 3: Test Conditions | | | |

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|---|---|
| **Study Citation:** | Getoff, N. (1991). Radiation- and photoinduced degradation of pollutants in water. A comparative study. International Journal of Radiation Applications and Instrumentation. Part C. Radiation Physics and Chemistry 37(5-6):673-680. |
| **OECD Harmonized Template:** | Photolysis in Water |
| **HERO ID:** | 5434138 |

| | | | 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 | Test conditions were reported. |
| | Metric 7: | Testing Consistency | High | Test conditions were consistent across study groups. |
| | Metric 8: | System Type and Design | High | The system 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 | Medium | The outcome assessment methodology addressed the dataset; however, degradation rates and half-lives were not reported. |
| | Metric 12: | Test Substance Purity | Low | Sampling methods were not reported. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Other loss processes were not discussed; no controls were reported. |
| | 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 | The analytical method was not reported. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | Statistical methods and kinetic calculations were not applied/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 the study type. |

## Overall Quality Determination — Medium

| | |
|---|---|
| **Study Citation:** | Brungard, K. L., Munakata-Marr, J., Johnson, C. A., Mandernack, K. W. (2003). Stable carbon isotope fractionation of trans-1,2-dichloroethylene during co-metabolic degradation by methanotrophic bacteria. Chemical Geology 195(1-4):59-67. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1956828 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | not reported; trans-1,2-dichloroethylene |
| Confidentiality, EndPoint, Type, Guideline | no; other; experimental; other: non-guideline: closed-bottle - pure culture co-metabolic degradation |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR Notes: t-DCE |
| Blank and Control | Controls with methanotrophic media and no culture included; previous sterile controls indicated no change in t-DCE concentrations; not reported |
| Oxygen and Inoculum | aerobic; other:: Pure cultures of Methylomonas methanica, Oak Ridge (type I methanotroph; membrane bound enzyme which degrade via co-metabolic process) and Methylosinus trichosporium OB3b (type II methanotroph; membrane and cytoplasmic enzymes which degrade via co-metabolic processes) |
| Duration, Parameter, System, and Sampling Frequency | 48 hours (degradation ended at 48 hrs due to cell death); test met., and radiochem. measure; isotopic fractionation: serum bottles; 0, 6, 12, 24, and 48 hours |
| pH Adjusted and pH | not reported; not reported |
| Concentration | ca. 15 - ca. 17 mg/L |
| Composition and Test Temperature | 20 µL test substance added; 80 ml of methanotrophic nutrient medium; 10 ml of methane injected into the headspace of serum bottles; bottles shaken at 95 rpm; 20°C |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | not reported; not reported; not reported; bottles were inverted to prevent leakage of test material |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | test mat.: GC with ECD; isotopic composition: Finnigan MAT 251 or 252 isotope ratio mass spectrometer; Stable carbon isotopic measurements were used to monitor biodegradation based on increases in the carbon isotope ratio ($\delta$-13C) of the residual solvent as its degraded.; not reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | not reported; not reported; not reported; $\delta$-13C of the t-DCE stock solution was -22.0±0.1‰ |
| Results Remarks and Results Details | Isotopic fractionation was indicated under the conditions based on residual t-DCE enrichment in 13C; biological fractionation, $\varepsilon$, measured for type I culture = -3.5% and type II culture = -6.7%; results based on standard $\delta$ notation relative to the Peedee Belemnite (PDB) carbonate standard $\delta$(‰) = (Rx/Rstd - 1) x 1000. Extent of biodegradation: M. methanica and M. trichosporium OB3b reduced t-DCE concentrations from ca. 17 to 5 mg/L and ca. 15 to 7 mg/L, respectively. A degradation product, which was observed to increase at a constant rate during the experiment, was postulated to be an epoxide based on GC-MS.; First-order rate constants: type I culture 0.65/day (r-squared = 0.96) and type II culture 0.39/day (r-squared = 0.98) |
| 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 | Low | The source and purity of the test substance were not reported. |

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|---|---|
| **Study Citation:** | Brungard, K. L., Munakata-Marr, J., Johnson, C. A., Mandernack, K. W. (2003). Stable carbon isotope fractionation of trans-1,2-dichloroethylene during co-metabolic degradation by methanotrophic bacteria. Chemical Geology 195(1-4):59-67. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1956828 |

| | | EVALUATION | | |
|---|---|---|---|---|
| Domain | Metric | | Rating | Comments |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Medium | Controls were appropriate for test validity; killed controls and abiotic (no culture) controls were conducted previously, results were noted as no change in concentrations, data was not shown. |
| | Metric 4: | Test Substance Stability | High | The test substance stability and storage conditions were acceptable. |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | High | The test method was suitable. |
| | Metric 6: | Testing Conditions | Low | Limited detail regarding testing conditions. |
| | Metric 7: | Testing Consistency | High | Temperature and media were consistent across study groups. |
| | Metric 8: | System Type and Design | High | The system type and design was appropriate. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Low | Pure cultures were used. |
| | Metric 10: | Sampling Methods | N/A | The metric is not applicable to the study type. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Medium | Non-standard assessment of biodegradation evaluated (isotope fractionation); however, the outcome assessment methodology addressed the intended outcome of interest. |
| | Metric 12: | Test Substance Purity | High | Sampling intervals were appropriate. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Sources of variability and uncertainty in the measurements were not reported. |
| | 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 | Analytical details were omitted; extraction efficiency, percent recovery, or mass balance were not measured or reported. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | High | 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 the study type. |

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|---|---|
| **Study Citation:** | Brungard, K. L., Munakata-Marr, J., Johnson, C. A., Mandernack, K. W. (2003). Stable carbon isotope fractionation of trans-1,2-dichloroethylene during co-metabolic degradation by methanotrophic bacteria. Chemical Geology 195(1-4):59-67. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1956828 |

**EVALUATION**

| Domain | Metric | Rating | Comments |
|---|---|---|---|
| **Overall Quality Determination** | | **Medium** | |

| | |
|---|---|
| **Study Citation:** | Chang, H. L., Alvarez-Cohen, L. (1996). Biodegradation of individual and multiple chlorinated aliphatic hydrocarbons by methane-oxidizing cultures. Applied and Environmental Microbiology 62(9):3371-3377. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1024038 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | Not reported; Not Reported |
| Confidentiality, EndPoint, Type, Guideline | No; Biodegradation; Experimental; other: Degradation using methane-oxidizing cultures |
| Solvent, Reactivity, Storage, Stability | de-ionized water; NR; A stock solution was prepared, in a glass vial, from the pure compound and de-ionized water, sealed and then settled for 24hr before use; NR |
| Radiolabel, Source, State, Purity | NR; Aldrich Chemical Co., Milwaukee, Wis; liquid; ≥97% Notes: NR |
| Blank and Control | Medium controls in the presence of formate included; Not applicable |
| Oxygen and Inoculum | not specified; Not Reported: Mixed methane-oxidizing culture grown under chemostat conditions; seeded with soil from a defunct landfill in Berkeley, CA |
| Duration, Parameter, System, and Sampling Frequency | 4 days; test material: Not reported; 24, 48, and 72h after initial injection |
| pH Adjusted and pH | No; 6.9-7.0 |
| Concentration | > 50 - < 1000 µg; specific test concentrations for individual test materials not reported |
| Composition and Test Temperature | nitrate mineral salts (NMS) medium; 20°C |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not reported; Not reported; Test material transferred from stock solutions using gas-tight syringes into test vials. |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Headspace analysis via GC-MS with flame ionization detector; mean Tc (transformation capacity of cells) µmol/mg; Not reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | 5.9 µmol/mg; ±0.25; Not reported; Formate |
| Results Remarks and Results Details | Tc = amount of test substance degraded divided by amount of cells inactivated; 1,2-DCA may have supplied carbon and/or energy to cells during the reaction possible allowing some cell growth or repair prior to inactivation. This indicates Tc may not represent an accurate measurement of product toxicity. Abiotic uptake = 0.02 µmol/mg.; Cell activity after 4 h of exposure = 5%; Degradation kinetics not reported for this test material |
| 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 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. |

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|---|---|
| **Study Citation:** | Chang, H. L., Alvarez-Cohen, L. (1996). Biodegradation of individual and multiple chlorinated aliphatic hydrocarbons by methane-oxidizing cultures. Applied and Environmental Microbiology 62(9):3371-3377. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1024038 |

| | | EVALUATION | | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 4: | Test Substance Stability | High | The test substance preparation and storage conditions were reported. |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | Low | Applied target chemical concentrations were not explicitly stated; non-guideline/non-standard method |
| | Metric 6: | Testing Conditions | Medium | Some testing conditions were reported. |
| | Metric 7: | Testing Consistency | High | Test conditions were consistent. |
| | Metric 8: | System Type and Design | N/A | This metric is not applicable to this study. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | High | The test inoculum 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 | Low | The outcome assessment methodology does not specifically address biodegradation. |
| | Metric 12: | Test Substance Purity | High | Sampling was appropriate. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Sources of variability and uncertainty were addressed; mass transfer between gas and liquid phase may limit overall degradation rates; all experiments were conducted in highly agitated batch reactors in order to avoid mass transfer limitations. |
| | 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 details and test concentrations 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 | 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:** | Chang, H. L., Alvarez-Cohen, L. (1996). Biodegradation of individual and multiple chlorinated aliphatic hydrocarbons by methane-oxidizing cultures. Applied and Environmental Microbiology 62(9):3371-3377. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1024038 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | Not reported; Not Reported |
| Confidentiality, EndPoint, Type, Guideline | No; Biodegradation; Experimental; other: Degradation using methane-oxidizing cultures |
| Solvent, Reactivity, Storage, Stability | de-ionized water; NR; A stock solution was prepared, in a glass vial, from the pure compound and de-ionized water, sealed and then settled for 24hr before use; NR |
| Radiolabel, Source, State, Purity | NR; Aldrich Chemical Co., Milwaukee, Wis; liquid; ≥97% Notes: NR |
| Blank and Control | Medium controls in the presence of formate included; Not applicable |
| Oxygen and Inoculum | not specified; Not Reported: Mixed methane-oxidizing culture grown under batch conditions; seeded from chemostat-grown culture (seeded from a defunct landfill in Berkeley, CA) |
| Duration, Parameter, System, and Sampling Frequency | 4 days; test material: Not reported; 24, 48, and 72h after initial injection |
| pH Adjusted and pH | No; 6.9-7.0 |
| Concentration | > 50 - < 1000 µg; specific test concentrations for individual test materials not reported |
| Composition and Test Temperature | nitrate mineral salts (NMS) medium; 20°C |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not reported; Not reported; Test material transferred from stock solutions using gas-tight syringes into test vials. |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Headspace analysis via GC-MS with flame ionization detector; mean Tc (transformation capacity of cells) µmol/mg; Not reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | 4.3 µmol/mg; ±1.1; Not reported; Formate |
| Results Remarks and Results Details | Tc = amount of test substance degraded divided by amount of cells inactivated; 1,2-DCA may have supplied carbon and/or energy to cells during the reaction possible allowing some cell growth or repair prior to inactivation. This indicates Tc may not represent an accurate measurement of product toxicity. Abiotic uptake = 0.02 µmol/mg.; Cell activity after 4 h of exposure = 5%; Degradation kinetics not reported for this test material |
| 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 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 | High | The test substance preparation and storage conditions were reported. |

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|---|---|
| **Study Citation:** | Chang, H. L., Alvarez-Cohen, L. (1996). Biodegradation of individual and multiple chlorinated aliphatic hydrocarbons by methane-oxidizing cultures. Applied and Environmental Microbiology 62(9):3371-3377. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1024038 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | Low | Applied target chemical concentrations were not explicitly stated; non-guideline/non-standard method |
| | Metric 6: | Testing Conditions | Medium | Some testing conditions were reported. |
| | Metric 7: | Testing Consistency | High | Test conditions were consistent. |
| | Metric 8: | System Type and Design | Medium | Limited detail regarding this metric; however, this was not likely to have a substantial impact on study results. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | High | The test inoculum 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 | Low | The outcome assessment methodology does not specifically address biodegradation. |
| | Metric 12: | Test Substance Purity | High | Sampling was appropriate. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Sources of variability and uncertainty were addressed; mass transfer between gas and liquid phase may limit overall degradation rates; all experiments were conducted in highly agitated batch reactors in order to avoid mass transfer limitations. |
| | 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 details and test concentrations 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 | 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:** | Dow Chemical, (2000). Introductory study of the biodegradation of the chlorinated methane, ethane and ethene compounds: Progress report CR806890-01 coop agreement. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 4215582 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-Dichloroethene |
| Confidentiality, EndPoint, Type, Guideline | None; anaerobic biodegradation; Experimental; other: Primary anaerobic biodegradation of trans-1,2-dichloroethene in muck sample |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; 200 µg sample contained 0.8 µg trichloroethylene, 0.5 µg of cis-1,2-dichloroethene, 0.03 µg tetrachloroethylene, 0.3 µg of methylene chloride and/or vinylidene chloride. |
| Blank and Control | Sterilized autoclaved control was used.; Not reported |
| Oxygen and Inoculum | anaerobic; natural water / sediment: Everglades muck and water collected on Feb 12, 1979 |
| Duration, Parameter, System, and Sampling Frequency | 20 days; test mat.: 60 ml septum vial; Days 0, 4, 13, and 20 |
| pH Adjusted and pH | Not Reported; Not reported |
| Concentration | 188 |
| Composition and Test Temperature | Anaerobic and microaerophilic system muck (screened) with muck water and a few mLs of methanol.; Not reported |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not reported; Not Reported; Anaerobic conditions assumed. 188 µg (200 µg nominal). High oxygen demand (value not recorded); TOC 25-45 ppm |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Purge and Trap method using Tenax GC- and Carbopac C (0.1% SP-1000).; trans-1,2-dichloroethene concentration; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | No decay of the test substance was observed after 20 days.; Not reported; Not reported; Not reported |
| Results Remarks and Results Details | Main degradation product is 1,2-dichloroethane.; Not reported |
| Results Mean Total Recovery and Results per Recovery | Yes; Averaged 88% over series of experiments |

**EVALUATION**

| Domain | Metric | | Rating | Comments |
|---|---|---|---|---|
| Domain 1: Test Substance | | | | |
| | Metric 1: | Test Substance Identity | High | The test substance was identified using common nomenclature. |
| | Metric 2: | Test Substance Purity | Low | The test substance contained impurities; however, the impurities are unlikely to have a substantial impact on the study results. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | High | Appropriate controls were used. |
| | 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. |

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| | |
|---|---|
| **Study Citation:** | Dow Chemical, (2000). Introductory study of the biodegradation of the chlorinated methane, ethane and ethene compounds: Progress report CR806890-01 coop agreement. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 4215582 |

| | | EVALUATION | |
|---|---|---|---|
| Domain | Metric | Rating | Comments |
| Domain 3: Test Conditions | | | |
| Metric 5: | Test Method Suitability | High | The test method was suitable for the test substance. |
| Metric 6: | Testing Conditions | Medium | Some of the testing conditions were not reported; however, the omissions are unlikely to have a substantial impact on the study results. |
| Metric 7: | Testing Consistency | Medium | There were no reported changes in the testing conditions between the sampling 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 details regarding the inoculum were not reported but 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 | Medium | The sampling methods were reported and appropriate. |
| Domain 6: Confounding/Variable Control | | | |
| Metric 13: | Confounding Variables | Low | Uncertainty in the concentration measurements was not reported but the omission is unlikely to have a substantial impact on the study results. |
| Metric 14: | Health Outcomes Unrelated to Exposure | N/A | The metric is not applicable to the study type. |
| Domain 7: Data Presentation and Analysis | | | |
| Metric 15: | Data Reporting | High | The target chemical concentrations were reported and the analytical method was suitable. |
| Metric 16: | Statistical Methods and Kinetic Calculations | Low | Statistical analysis was not reported but the omission is unlikely to have a substantial impact on the study results. |
| Domain 8: Other | | | |
| Metric 17: | Verification or Plausibility of Results | Low | The study results are reasonable. |
| Metric 18: | QSAR Models | N/A | The metric is not applicable to the study type. |

## Overall Quality Determination — Medium

| | |
|---|---|
| **Study Citation:** | Hopkins, G. D., Mccarty, P. L. (1995). Field evaluation of in situ aerobic cometabolism of trichloroethylene and three dichloroethylene isomers using phenol and toluene as the primary substrates. Environmental Science & Technology 29(6):1628-1637. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1740070 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; trans 1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; screening test; Experimental; other: in situ treatment and evaluation of removal through cometabolism via injection of chemically augmented groundwater into an aquifer |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR |
| Blank and Control | Not reported; Not reported |
| Oxygen and Inoculum | other; natural water / sediment: South-southeast well leg of groundwater aquifer located in Moffett Field Naval Air; Aquifer is silt, sand, and gravel alluvial deposit 1.4 m thick and 5 m below ground surfaceStation, Mountain View, Calif. |
| Duration, Parameter, System, and Sampling Frequency | t-DCE injection occurred over 191 hours (1465-1656h); test mat.: in situ treatment in an aquifer and cometabolism of t-DCE with TCE and toluene as the primary substrate; Not reported |
| pH Adjusted and pH | Not Reported; Not reported |
| Concentration | 81 µg/L |
| Composition and Test Temperature | water is slightly saline, total dissolved solids=1460 mg/L with some chlorinated aliphatic hydrocarbon contamination (not including t-DCE); specific details on groundwater chemical composition is cited; Ambient; not specified |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not applicable; yes; t-DCE was injected during the time period 1465-1656h (TCE was added continuously 0-2000h, toluene added 980-2000h; steady state reached between CAH augmentations); the measured concentration was observed in the wells for evaluation of removal |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Quantification via GC; detection limit=1.0 µg/L; % removal; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | 75; Not reported; Not reported; In previous studies, at the same site, t-DCE removal with methane and phenol as primary substrates reached 90% and 73%, respectively. |
| Results Remarks and Results Details | t-DCE removal was considered relatively moderate. Dilution monitored with bromide tracer. Previous studies on Moffett Field site support statement that removals are result of biological degradation.; 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 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 | Controls were not included; however, the omission does not hinder the interpretation of the results. |

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| | |
|---|---|
| **Study Citation:** | Hopkins, G. D., Mccarty, P. L. (1995). Field evaluation of in situ aerobic cometabolism of trichloroethylene and three dichloroethylene isomers using phenol and toluene as the primary substrates. Environmental Science & Technology 29(6):1628-1637. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1740070 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 4: | Test Substance Stability | Low | The test substance stability, preparation and storage conditions were not reported. |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | High | This metric met the criteria for high confidence as expected for this type of study. |
| | Metric 6: | Testing Conditions | Medium | Some testing condition details were not reported; however, details on additional site characteristics were cited. |
| | Metric 7: | Testing Consistency | High | Test conditions were consistent from the data provided. |
| | Metric 8: | System Type and Design | High | The system was appropriate. |
| 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 | This outcome assessment addressed the dataset. |
| | Metric 12: | Test Substance Purity | Low | Information regarding this metric was not reported. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Limited information was presented regarding this metric; variability and uncertainty in the measurements 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 detail, mass balance 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 | Due to limited information on analytical methods, sampling, and confounding variables, 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:** | Hunkeler, D., Aravena, R., Cox, E. (2002). Carbon isotopes as a tool to evaluate the origin and fate of vinyl chloride: Laboratory experiments and modeling of isotope evolution. Environmental Science & Technology 36(15):3378-3384. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 659065 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | Not reported; trans-1,2-dichloroethene |
| Confidentiality, EndPoint, Type, Guideline | None; other - screening test and carbon isotope fractionation; Experimental; other: Microcosm |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR Notes: NR |
| Blank and Control | Autoclaved and killed (mercuric chloride) controls included; one control microcosm was amended with 1,2-DCA and 1,1,2-TCA, the other with 1,1-DCE, trans-1,2-DCE, and cis-1,2-DCE. No significant changes were observed in the control indicating abiotic transformation was negligible; variation of 13C was <0.8% and changes in concentrations were <15% for all compounds.; Not reported |
| Oxygen and Inoculum | anaerobic; natural water / sediment: Microcosms were prepared using aquifer material and groundwater from a site in Louisiana previously used for the disposal of liquid chlorinated hydrocarbons (soil and groundwater collected 180 m downgradient from the former impoundments). |
| Duration, Parameter, System, and Sampling Frequency | Up to 250 days; radiochem. measure, test mat.: 250 mL sterile glass bottles, with 60 g homogenized aquifer material and 150 mL groundwater; Not reported |
| pH Adjusted and pH | Not reported; Not reported |
| Concentration | 68.3 ppm |
| Composition and Test Temperature | Methanol, ethanol, acetate, and lactate (50 mg/L each) mixture was added as electron donor to all microcosms including controls each time chlorinated compounds were added.; Not reported |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not reported; Not reported; Microcosms in July 1999, were amended with a mixture of PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and VC at a concentration of 10 ppm each; beginning May 2000, microcosms were purged for 3 h with 5% CO2/95% N2 and amended with a mixture of cis-1,2-DCE, trans-1,2-DCE, and 1,1-DCE (40 ppm each). Final concentration of trans-1,2-DCE in the aqueous phase: 68.3 ppm. |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Headspace analysis via GC-FID. Detection limits were between 6 and 200 ppb depending on the Henry's coefficient of the compound. The standard uncertainty of the method was 6% for chlorinated hydrocarbons.; Degradation of test material; Not reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | Complete dechlorination of trans-DCE was observed within 90 days.; Not reported; Not reported (2-5 days based on the figures); <15% changes in concentration |
| Results Remarks and Results Details | Maximum concentrations of vinyl chloride accounted for about 50% of the initial t-DCE.; 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 | Low | The source and purity of the test substance were not reported or verified by analytical means. |

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|---|---|
| **Study Citation:** | Hunkeler, D., Aravena, R., Cox, E. (2002). Carbon isotopes as a tool to evaluate the origin and fate of vinyl chloride: Laboratory experiments and modeling of isotope evolution. Environmental Science & Technology 36(15):3378-3384. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 659065 |

| | | EVALUATION | | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | High | Appropriate controls were included. |
| | Metric 4: | Test Substance Stability | Medium | The test substance stability, homogeneity, preparation or storage conditions were not reported; however, these factors were not likely to influence the test substance or were not likely to have a substantial impact on study results. |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | High | The test method was suitable for the test substance. |
| | Metric 6: | Testing Conditions | Low | Limited detail regarding the test conditions (missing temperature and pH). |
| | Metric 7: | Testing Consistency | High | Test was consistent across study groups. |
| | Metric 8: | System Type and Design | High | The system type and design was 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 the 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 (i.e. biodegradation rate not reported). |
| | Metric 12: | Test Substance Purity | Medium | Limited detail regarding sampling methods. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | Sources of variability and uncertainty in the measurements and statistical techniques were reported in the study and the differences in the measurements between study groups 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. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Medium | Some analytical detail 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 | High | The study results were reasonable. |
| | Metric 18: | QSAR Models | N/A | The metric is not applicable to this study. |

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|---|---|
| **Study Citation:** | Hunkeler, D., Aravena, R., Cox, E. (2002). Carbon isotopes as a tool to evaluate the origin and fate of vinyl chloride: Laboratory experiments and modeling of isotope evolution. Environmental Science & Technology 36(15):3378-3384. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 659065 |

**EVALUATION**

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

| | |
|---|---|
| **Study Citation:** | Leeson, A., Bouwer, E. J. (1989). Transformation kinetics of halogenated aliphatic compounds under aerobic conditions. :670-679. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5475937 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | not reported; trans-1,2-dichloroethylene |
| Confidentiality, EndPoint, Type, Guideline | no; screening test; experimental; other: non-guideline: biotransformation in batch reactors using a methanotrophic inoculum |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR Notes: NR |
| Blank and Control | non-inoculated control included; autoclaved control included; no biotransformation was observed |
| Oxygen and Inoculum | aerobic; other:: enrichment culture of a methanotrophs |
| Duration, Parameter, System, and Sampling Frequency | 4 weeks; test mat.: batch reactors; not reported |
| pH Adjusted and pH | not reported; not reported |
| Concentration | = 20 - = 50 ppb |
| Composition and Test Temperature | mineral salts solution; not reported |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | not reported; not reported; not reported; headspace air contained 15% methane in oxygen as carbon source |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | GC-ECD; % removal; not reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | 85%; not reported; 4 weeks; not reported |
| Results Remarks and Results Details | trans-1,2-dichloroethylene was degraded under the test conditions; transformation product identified: 1,2-dichloroethanal (proposed pathway: trans-1,2-dichloroethylene -> [1,2-dichloroethane epoxide] -> 1,2-dichloroethanal -> [1, 1-dichloroethanal] -> CO2; rate of degradability (k/ks) = 5.2 L/g·day; half life = 13 days (estimated based on a constant cell population of 10^7 cells/ml (10 mg/L)) |
| 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 | Uninformative | The test substance was not identified clearly; details for degradation products of relate to trans-1,2-dichloroethylene. TCE is defined as trichloroethylene in the body of the paper. |
| | Metric 2: Test Substance Purity | Low | Details regarding the test substance source and purity were not reported. |
| Domain 2: Test Design | | | |
| | Metric 3: Study Controls | Medium | Controls were included; results not reported. |
| | Metric 4: Test Substance Stability | Medium | The test substance preparation and storage conditions details were not reported. |

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|---|---|
| **Study Citation:** | Leeson, A., Bouwer, E. J. (1989). Transformation kinetics of halogenated aliphatic compounds under aerobic conditions. :670-679. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5475937 |

| | | **EVALUATION** | |
|---|---|---|---|
| Domain | Metric | Rating | Comments |
| Domain 3: Test Conditions | | | |
| Metric 5: | Test Method Suitability | High | The test method was suitable for the test substance. |
| Metric 6: | Testing Conditions | Medium | Some test condition details were not reported. |
| Metric 7: | Testing Consistency | Medium | Limited details regarding testing consistency were reported; however, the omissions were not likely to have had a substantial impact on the interpretation of the study results. |
| Metric 8: | System Type and Design | Medium | Limited details regarding test system design were reported; however, the omissions were not likely to have had a substantial impact on the interpretation of the study results. |
| Domain 4: Test Organisms | | | |
| Metric 9: | Outcome Assessment Methodology | Low | The test inoculum sources was not reported, enrichment cultures are not routinely used. |
| 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 | Low | Details regarding sampling methods of the outcome were not fully reported. |
| Domain 6: Confounding/Variable Control | | | |
| Metric 13: | Confounding Variables | Low | Sources of variability and uncertainty in the measurements and statistical techniques and between study groups (if applicable) 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 | Several experimental details, including analytical details, were not reported and the mass balance not fully reported; these omissions may have a substantial impact on the study results. |
| Metric 16: | Statistical Methods and Kinetic Calculations | High | Kinetics calculations were reported. |
| Domain 8: Other | | | |
| Metric 17: | Verification or Plausibility of Results | Low | Analytical detail and control groups missing. |
| Metric 18: | QSAR Models | N/A | The metric is not applicable to the study type. |

## Overall Quality Determination — Uninformative

| | |
|---|---|
| **Study Citation:** | Lesage, S., Mcbride, R. A., Cureton, P. M., Brown, S. (1993). Fate of organic solvents in landfill leachates under simulated field conditions and in anaerobic microcosms. Waste Management & Research 11(3):215-226. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1742586 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | not reported; trans-1,2-dichlorethene |
| Confidentiality, EndPoint, Type, Guideline | No; other; Non-guideline: field study; other: Fate in municipal solid waste landfill leachates |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; Municipal solid waste landfill leachates from Ontario, Canada; NR; NR Notes: NR |
| Blank and Control | not reported; not reported |
| Oxygen and Inoculum | anaerobic; other:: Field study: Municipal solid waste landfill leachates collected in May 1988 and 1989 from sites in Ontario Canada, with different contamination profiles: Guelph leachate (1989), Guelph leachate (1989), and Muskoka leachate (1989) |
| Duration, Parameter, System, and Sampling Frequency | up to 90 days 2 study periods in 1989 and 1999; test mat.: 200L holding tanks in tandem with bottom-draining lysimeter; 0, 2, 6, 14, 28, 42, 66, and 90 days |
| pH Adjusted and pH | not reported; not reported |
| Concentration | not reported not reported - not reported not reported not reported |
| Composition and Test Temperature | not reported; Ambient temp |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | not reported; not reported; not reported; Samples stored in environmentally-controlled chamber at 20Â°C. |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | GC/MS; EPA method 624 used for analysis of VOCs; precision ranged from 15-50% RSD for all analytes; not reported; not reported |
| 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 | trans-1,2-dichlorethene was present in Guelph leachate (1989) = 4 Âµg/L; trans-1,2-dichlorethene was detected in Lysimeter effluent samples: Guelph leachate (1989) = 2 - 4 Âµg/L. Concentrations of trans-1,2-dichlorethene in Guelph leachate (1990) over a 90-day period: initial: ca. 300 Âµg/L, peak ca. 900 Âµg/L (28 days), final ca. 200 Âµg/L (90 days).; 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 | N/A | The metric is not applicable to this study type. Field study; 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:** | Lesage, S., Mcbride, R. A., Cureton, P. M., Brown, S. (1993). Fate of organic solvents in landfill leachates under simulated field conditions and in anaerobic microcosms. Waste Management & Research 11(3):215-226. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1742586 |

| | | 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 | Low | Field study with variable leachates; multiple lysimeters sampling locations not clearly described. |
| | Metric 6: | Testing Conditions | Medium | Some testing conditions were reported including temperature, anaerobic conditions, and sampling times |
| | Metric 7: | Testing Consistency | Medium | Reported testing conditions, although limited appeared to be consistent across the different sampling sites. |
| | Metric 8: | System Type and Design | High | The system and design were reported. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | Microbial viability not tested/reported. Field study under anaerobic conditions. |
| | 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 assessment methodology did not address or report the outcome of interest. |
| | Metric 12: | Test Substance Purity | Medium | Details regarding sampling methods of the outcome were not reported. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Low | Sources of uncertainty and variability in measurements and techniques were not well 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 | Insufficient evidence to to confirm that disappearance was due to some other process. Specific transformation products, percent recovery, or mass balance were not measured or reported. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | The metric is not applicable 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; outcome of interest was not reported. |
| | Metric 18: | QSAR Models | N/A | The metric is not applicable to this study type. |

## Overall Quality Determination — Medium

| | |
|---|---|
| **Study Citation:** | Mudder, T. I. (1981). Development of empirical structure - Biodegradability relationships and testing protocol for slightly soluble and volatile priority pollutants. Dissertation Abstracts International, B: The Sciences and Engineering Doctoral Dissertation:216. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5258494 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; Trans-1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; Not Reported; Experimental; other: Modified shake-flask method |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; Chem Service, Inc., West Chester, PA; NR; 99% |
| Blank and Control | Sterile control; Volatile loss control |
| Oxygen and Inoculum | aerobic; natural water / sediment: Microbial inoculum from secondary effluent, Iowa River water, and Iowa farm soil |
| Duration, Parameter, System, and Sampling Frequency | 24 days; test mat.: 1L vacuum filter flask, two borosilicate screw caps vials fitted side-by-side to the neck of the flask. Flasks were sealed with Supelco Mininert Teflon values.; 0, 3, 12, 24 d |
| pH Adjusted and pH | Not Reported; > 6.5 |
| Concentration | 5.5 mg/L |
| Composition and Test Temperature | Not reported; 25±1°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 Direct Quantum Yield Results | Varian model 3700 GC with dial FID detectors. Method allowed quantitation to the nearest 0.1 mg/L; Target compound; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | Negligible; Not reported; 24 days; Negligible losses after 100 hr; No chemical or physical degradation observed, 1.0% adsorption onto biological floc; |
| Results Remarks and Results Details | Test substance (mg/L): 5.5±0.1/0d, 5.1± 1/3d, 5.5±0.1/12d, 5.5±0.1 /24d; 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 source and purity was reported. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | High | Negative controls were included and tested valid. |
| | Metric 4: | Test Substance Stability | High | Test substance preparation and storage before analysis were reported and appropriate for the substance. |
| Domain 3: Test Conditions | | | | |

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|---|---|
| **Study Citation:** | Mudder, T. I. (1981). Development of empirical structure - Biodegradability relationships and testing protocol for slightly soluble and volatile priority pollutants. Dissertation Abstracts International, B: The Sciences and Engineering Doctoral Dissertation:216. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5258494 |

| | | | **EVALUATION** | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 5: | Test Method Suitability | High | The test method was suitable for the test substance. |
| | Metric 6: | Testing Conditions | High | The majority of the appropriate test conditions were 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 | N/A | Not applicable |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | Limited inoculum information was reported, several pages potentially having this information are missing from the pdf. |
| | 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 | The study used sampling methods that address the outcomes of interest and used widely accepted methods for the chemical and media being analyzed. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | Variability and uncertainty were accounted for in the measurements and between study groups. |
| | 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 | Target chemical concentrations were reported and sufficient evidence was presented to confirm that the parent compound disappearance was not due to some other process. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | N/A | Not applicable |
| 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

* Related References: Mudder TI; Diss Abstr Int B 42: 1804 (1981), HSDB

| | |
|---|---|
| **Study Citation:** | Mudder, T. I. (1981). Development of empirical structure - Biodegradability relationships and testing protocol for slightly soluble and volatile priority pollutants. Dissertation Abstracts International, B: The Sciences and Engineering Doctoral Dissertation:216. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5258494 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; Trans-1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; Not Reported; Experimental; other: Modified shake-flask method |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; Chem Service, Inc., West Chester, PA; NR; 99% |
| Blank and Control | Sterile control; Volatile loss control |
| Oxygen and Inoculum | aerobic; natural water / sediment: Microbial inoculum from secondary effluent, Iowa River water, and Iowa farm soil |
| Duration, Parameter, System, and Sampling Frequency | 21 days(acclimation); 9 days; test mat.: 1L vacuum filter flask, two borosilicate screw caps vials fitted side-by-side to the neck of the flask. Flasks were sealed with Supelco Mininert Teflon values.; 0, 20, 144, and 216 hr |
| pH Adjusted and pH | Not Reported; $>$ 6.5 |
| Concentration | 25.0 mg/L |
| Composition and Test Temperature | Not reported; 25$\pm$1°C |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not reported; yes; Adaptive transfers every 72 hours with initial 25 mg/L lactose and initial 20 mg/L oxygen |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Varian model 3700 GC with dial FID detectors. Method allowed quantitation to the nearest 0.1 mg/L; Target compound; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | Negligible; Not reported; 216 hours; Negligible losses after 100 hr; No chemical or physical degradation observed, 1.0% adsorption onto biological floc; |
| Results Remarks and Results Details | Test substance (mg/L): 25.0$\pm$ 0.1/ 0hr, 24.8$\pm$ 1/20 hr, 25.0$\pm$0.1/144 hr, 24.9$\pm$0.1/216 hr; 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 source and purity was reported. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | High | Negative controls were included and tested valid. |
| | Metric 4: | Test Substance Stability | High | Test substance preparation and storage before analysis were reported and appropriate for the substance. |
| 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:** | Mudder, T. I. (1981). Development of empirical structure - Biodegradability relationships and testing protocol for slightly soluble and volatile priority pollutants. Dissertation Abstracts International, B: The Sciences and Engineering Doctoral Dissertation:216. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5258494 |

| | | **EVALUATION** | | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 6: | Testing Conditions | High | The majority of the appropriate test conditions were 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 | N/A | Not applicable |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | Limited inoculum information was reported, several pages potentially having this information are missing from the pdf. |
| | 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 | The study used sampling methods that address the outcomes of interest and used widely accepted methods for the chemical and media being analyzed. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | Variability and uncertainty were accounted for in the measurements and between study groups. |
| | 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 | Target chemical concentrations were reported and sufficient evidence was presented to confirm that the parent compound disappearance was not due to some other process. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | N/A | Not applicable |
| 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

* Related References: Mudder TI; Diss Abstr Int B 42: 1804 (1981), HSDB

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|---|---|
| **Study Citation:** | Mudder, T. I. (1981). Development of empirical structure - Biodegradability relationships and testing protocol for slightly soluble and volatile priority pollutants. Dissertation Abstracts International, B: The Sciences and Engineering Doctoral Dissertation:216. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5258494 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; Trans-1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; Not Reported; Experimental; other: Modified shake-flask method |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; Chem Service, Inc., West Chester, PA; NR; 99% |
| Blank and Control | Sterile control; Volatile loss control |
| Oxygen and Inoculum | aerobic; natural water / sediment: Microbial inoculum from secondary effluent, Iowa River water, and Iowa farm soil |
| Duration, Parameter, System, and Sampling Frequency | 21 days(acclimation); 5 days; test mat.: 1L vacuum filter flask, two borosilicate screw caps vials fitted side-by-side to the neck of the flask. Flasks were sealed with Supelco Mininert Teflon values.; 0, 1, 2, 3, 4, 5 d |
| pH Adjusted and pH | Not Reported; $>$ 6.5 |
| Concentration | 0.90 mg/L |
| Composition and Test Temperature | Not reported; 25$\pm$1°C |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not reported; yes; Adaptive transfers every 72 hours with initial 100 mg/L lactose and initial 20 mg/L oxygen |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Varian model 3700 GC with dial FID detectors. Method allowed quantitation to the nearest 0.1 mg/L; Target compound; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | Negligible; Not reported; 5 days; Negligible losses after 100 hr; No chemical or physical degradation observed, 1.0% adsorption onto biological floc; |
| Results Remarks and Results Details | Test substance (mg/L): 0.90$\pm$0.1/0d, 0.90$\pm$1/1d, 0.90$\pm$0.1/2d, 0.90$\pm$0.1/3d, 1.0$\pm$0.1/4d, 0.95$\pm$0.1/5d; 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 source and purity was reported. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | High | Negative controls were included and tested valid. |
| | Metric 4: | Test Substance Stability | High | Test substance preparation and storage before analysis were reported and appropriate for the substance. |
| 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:** | Mudder, T. I. (1981). Development of empirical structure - Biodegradability relationships and testing protocol for slightly soluble and volatile priority pollutants. Dissertation Abstracts International, B: The Sciences and Engineering Doctoral Dissertation:216. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5258494 |

| | | **EVALUATION** | | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 6: | Testing Conditions | High | The majority of the appropriate test conditions were 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 | N/A | Not applicable |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | Limited inoculum information was reported, several pages potentially having this information are missing from the pdf. |
| | 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 | The study used sampling methods that address the outcomes of interest and used widely accepted methods for the chemical and media being analyzed. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | Variability and uncertainty were accounted for in the measurements and between study groups. |
| | 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 | Target chemical concentrations were reported and sufficient evidence was presented to confirm that the parent compound disappearance was not due to some other process. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | N/A | Not applicable |
| 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

* Related References: Mudder TI; Diss Abstr Int B 42: 1804 (1981), HSDB

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|---|---|
| **Study Citation:** | Mudder, T. I. (1981). Development of empirical structure - Biodegradability relationships and testing protocol for slightly soluble and volatile priority pollutants. Dissertation Abstracts International, B: The Sciences and Engineering Doctoral Dissertation:216. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5258494 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; Trans-1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; Not Reported; Experimental; other: Modified river die-away |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; Chem Service, Inc., West Chester, PA; NR; 99% |
| Blank and Control | Sterile control; Volatile loss control |
| Oxygen and Inoculum | aerobic; natural water / sediment: Raw river water collected from University of Iowa water treatment plant |
| Duration, Parameter, System, and Sampling Frequency | 21 days (acclimation); 100 hours; test mat.: 1L vacuum filter flask, two borosilicate screw caps vials fitted side-by-side to the neck of the flask. Flasks were sealed with Supelco Mininert Teflon values.; 0, 24, 75, and 108 hr |
| pH Adjusted and pH | Not Reported; $>$ 6.5 |
| Concentration | 19.3 mg/L |
| Composition and Test Temperature | Not reported; 25$\pm$1°C |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not reported; yes; Adaptive transfers were made every 72 hours after an initial 120 hr acclimation period |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Varian model 3700 GC with dial FID detectors. Method allowed quantitation to the nearest 0.1 mg/L; Target compound; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | Negligible; Not reported; 108 hours; Negligible losses after 100 hr; No chemical or physical degradation observed, 1.0% adsorption onto biological floc; |
| Results Remarks and Results Details | Test substance (mg/L): 19.3$\pm$0.1/ 0 hr, 19.7$\pm$1/24 hr, 19.5$\pm$0.1/75 hr, 19.7$\pm$0.1/108 hr; 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 source and purity was reported. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | High | Negative controls were included and tested valid. |
| | Metric 4: | Test Substance Stability | High | Test substance preparation and storage before analysis were reported and appropriate for the substance. |
| 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:** | Mudder, T. I. (1981). Development of empirical structure - Biodegradability relationships and testing protocol for slightly soluble and volatile priority pollutants. Dissertation Abstracts International, B: The Sciences and Engineering Doctoral Dissertation:216. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5258494 |

| | | **EVALUATION** | | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 6: | Testing Conditions | High | The majority of the appropriate test conditions were 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 | N/A | Not applicable |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | Limited inoculum information was reported, several pages potentially having this information are missing from the pdf. |
| | 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 | The study used sampling methods that address the outcomes of interest and used widely accepted methods for the chemical and media being analyzed. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | Variability and uncertainty were accounted for in the measurements and between study groups. |
| | 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 | Target chemical concentrations were reported and sufficient evidence was presented to confirm that the parent compound disappearance was not due to some other process. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | N/A | Not applicable |
| 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

* Related References: Mudder TI; Diss Abstr Int B 42: 1804 (1981), HSDB

| | |
|---|---|
| **Study Citation:** | NCBI, (2020). PubChem database: compound summary: trans-1,2-Dichloroethylene. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 6629394 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; ready biodegradability; Experimental; OECD Guideline 301 C (Ready Biodegradability: Modified MITI Test (I)): OECD Guideline 301C |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR Notes: NA |
| Blank and Control | Not reported; Not reported |
| Oxygen and Inoculum | aerobic; activated sludge (adaptation not specified): 1 drop/L |
| Duration, Parameter, System, and Sampling Frequency | 4 weeks; ThOD: Not reported; Not reported |
| pH Adjusted and pH | Not reported; Not reported |
| Concentration | 2.32 mg/L |
| Composition and Test Temperature | NR; Not reported |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not reported; Not reported; Not reported |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Not reported; theoretical BOD; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | 0%; Not reported; Not reported; Not reported |
| Results Remarks and Results Details | Not reported; Not reported |
| Results Mean Total Recovery and Results per Recovery | Not reported; Not reported |

**EVALUATION**

| Domain | Metric | | Rating | Comments |
|---|---|---|---|---|
| Domain 1: Test Substance | | | | |
| | Metric 1: | Test Substance Identity | High | The test substance was identified by name. |
| | Metric 2: | Test Substance Purity | Medium | Not reported in this secondary source; the primary source likely contains more detail. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 4: | Test Substance Stability | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| Domain 3: Test Conditions | | | | |

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|---|---|
| **Study Citation:** | NCBI, (2020). PubChem database: compound summary: trans-1,2-Dichloroethylene. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 6629394 |

| Domain | | Metric | EVALUATION Rating | Comments |
|---|---|---|---|---|
| | Metric 5: | Test Method Suitability | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 6: | Testing Conditions | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 7: | Testing Consistency | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 8: | System Type and Design | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | Details regarding this metric were limited; however, additional information may be included in the primary source. |
| | Metric 10: | Sampling Methods | N/A | The metric is not applicable to the study type. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Medium | Not reported in this secondary source; the primary source likely contains more detail. |
| | Metric 12: | Test Substance Purity | Medium | Not reported in this secondary source; the primary source likely contains more detail. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Not reported in this secondary source; the primary source likely contains more 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 | High | The outcome of interest was reported clearly. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | Not reported in this secondary source; the primary source likely contains more detail. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Medium | Due to limited information in the secondary source, the plausibility of the study results cannot be determined. |
| | Metric 18: | QSAR Models | N/A | This metric is not applicable to this type of study. |

## Overall Quality Determination — Medium

* Related References: NITE; Chemical Risk Information Platform (CHRIP). Biodegradation and Bioconcentration. Tokyo, Japan: Natl Inst Tech Eval.; HSDB

| | |
|---|---|
| **Study Citation:** | NCBI, (2020). PubChem database: compound summary: trans-1,2-Dichloroethylene. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 6629394 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; inherent biodegradability; Experimental; other: Modified Shake flask method to accommodate volatile chemicals and River die away test |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR |
| Blank and Control | Not reported; Not reported |
| Oxygen and Inoculum | aerobic; not specified: Not reported |
| Duration, Parameter, System, and Sampling Frequency | 21 day acclimation period; no additional detail; not specified: Shake flask; Not reported |
| pH Adjusted and pH | Not Reported; Not reported |
| Concentration | 0.8 - 25 mg/L |
| Composition and Test Temperature | Not reported; Not reported |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not reported; Not Reported; Not reported |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Not reported; Not reported; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | no biodegradation occurred; Not reported; Not reported; Not reported |
| Results Remarks and Results Details | Recalcitrant with 21 day acclimation period and lactose addition; 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 | Not reported in this secondary source; the primary source likely contains more detail. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 4: | Test Substance Stability | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary sources. |

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|---|---|
| **Study Citation:** | NCBI, (2020). PubChem database: compound summary: trans-1,2-Dichloroethylene. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 6629394 |

| Domain | | Metric | EVALUATION Rating | Comments |
|---|---|---|---|---|
| | Metric 6: | Testing Conditions | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 7: | Testing Consistency | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 8: | System Type and Design | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary sources. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary sources. |
| | Metric 10: | Sampling Methods | N/A | The metric is not applicable to the study type. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Medium | Details regarding this metric were limited; however, additional information may be included in the primary source. |
| | Metric 12: | Test Substance Purity | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary sources. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Not reported in this secondary source; the primary source 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 | High | The outcome of interest was reported clearly. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | Not reported in this secondary source; the primary source likely contains more detail. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Medium | Due to limited information in the secondary source, the plausibility of the study results cannot be determined. |
| | Metric 18: | QSAR Models | N/A | This metric is not applicable to this type of study. |

## Overall Quality Determination — Medium

* Related References: Mudder TI, Musterman JL; PP. 52-3 in Preprints. Div Environ Chem Amer Chem Soc, Sept. Kansas City, MO (1982); Mudder TI; Diss Abstr Int B 42: 1804 (1981) HERO ID: 5258494

| | |
|---|---|
| **Study Citation:** | Olaniran, A. O., Pillay, D., Pillay, B. (2006). Biostimulation and bioaugmentation enhances aerobic biodegradation of dichloroethenes. Chemosphere 63(4):600-608. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 3571750 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; trans 1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; other; Experimental; other: Not reported; biodegradation in wastewater |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR |
| Blank and Control | Autoclaved water, and amended with HgCl2; Not reported |
| Oxygen and Inoculum | aerobic; other:: Wastewater from clarification tank of Northern WWTP in Durban, KwaZulu-Natal, South Africa |
| Duration, Parameter, System, and Sampling Frequency | 4 weeks; test mat.: Microcosms constructed in laminar flow cabinet in 250 mL serum bottles, crimp-sealed with Teflon-faced butyl rubbers; 0, 1, 2, 3, 4 wk |
| pH Adjusted and pH | Not Reported; 6.98 |
| Concentration | 0.5 mM |
| Composition and Test Temperature | Natural wastewater contained calcium (16.4 ug/mL), magnesium (6.60 ug/mL), sodium (62.5 ug/mL), potassium (15.1 ug/mL), iron (0.33 ug/mL), soluble nitrate and nitrite (18.2 and $<$ 0.05 ug/mL), and phosphate (4.2 ug/mL); 25°C |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not reported; Not Reported; Total heterotrophic bacterial population: 13.25±1.25 cfu/g x 10^5 |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Varian model 3700 gas chromatograph with flame ionization detector; Headspace analyzed, 100 uL samples collected with gas-tight syringe; % test substance degradation; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | Approx. 46%; Not reported; 4 week; Not reported |
| Results Remarks and Results Details | Test substance remaining: 100%/0wk, 83%/1 wk, 80%/2 wk, 60.16%/3wk, 54%/4wk Values reported graphically and are approximate, except for at 3 wk which was reported in text.; Biodegradation rate constant: 0.182±0.0481/wk |
| Results Mean Total Recovery and Results per Recovery | Not applicable; Not reported |

**EVALUATION**

| Domain | Metric | | Rating | Comments |
|---|---|---|---|---|
| Domain 1: Test Substance | | | | |
| | Metric 1: | Test Substance Identity | High | The test substance was identified definitively by name. |
| | Metric 2: | Test Substance Purity | Medium | The test substance source and purity were not reported. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Medium | A sterile control was included, however the results were not reported. |
| | Metric 4: | Test Substance Stability | Medium | Test substance initial concentration was reported, other preparation details were not included. |

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|---|---|
| **Study Citation:** | Olaniran, A. O., Pillay, D., Pillay, B. (2006). Biostimulation and bioaugmentation enhances aerobic biodegradation of dichloroethenes. Chemosphere 63(4):600-608. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 3571750 |

| | | **EVALUATION** | |
|---|---|---|---|
| Domain | Metric | Rating | Comments |
| Domain 3: Test Conditions | | | |
| Metric 5: | Test Method Suitability | High | The test method was suitable for the test substance. |
| Metric 6: | Testing Conditions | High | Appropriate test conditions and soil details were reported. |
| Metric 7: | Testing Consistency | High | Test conditions were consistent across samples and study groups. |
| Metric 8: | System Type and Design | N/A | Not applicable. |
| Domain 4: Test Organisms | | | |
| Metric 9: | Outcome Assessment Methodology | High | Inoculum source reported and appropriate for the study. |
| 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 and frequency were appropriate. |
| Domain 6: Confounding/Variable Control | | | |
| Metric 13: | Confounding Variables | High | Variability was addressed by statistical techniques, no apparent sources of uncertainty 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 | The analytical method was appropriate however mass balance, recovery, and limits of detection were not reported. |
| Metric 16: | Statistical Methods and Kinetic Calculations | Medium | Kinetic calculations were described elsewhere, in LaGrega, M.D., Buckingham, P.L., Evans, J.C., 1994. Growthkinetics. In: Clark, B.J., Morris, J.M. (Eds.), HazardousWaste Management. McGraw Hill Inc. Publishers,p. 581. |
| 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:** | Olaniran, A. O., Pillay, D., Pillay, B. (2006). Biostimulation and bioaugmentation enhances aerobic biodegradation of dichloroethenes. Chemosphere 63(4):600-608. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 3571750 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; trans 1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; other; Experimental; other: Not reported; biodegradation in wastewater |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR |
| Blank and Control | Autoclaved water, and amended with HgCl2; Not reported |
| Oxygen and Inoculum | aerobic; other:: Wastewater from clarification tank of New Germany WWTP in Durban, KwaZulu-Natal, South Africa |
| Duration, Parameter, System, and Sampling Frequency | 4 weeks; test mat.: Microcosms constructed in laminar flow cabinet in 250 mL serum bottles, crimp-sealed with Teflon-faced butyl rubbers; 0, 1, 2, 3, 4 wk |
| pH Adjusted and pH | Not Reported; 6.94 |
| Concentration | 0.5 mM |
| Composition and Test Temperature | Natural wastewater contained calcium (25.9 ug/mL), magnesium (5.55 ug/mL), sodium (93.0 ug/mL), potassium (11.6 ug/mL), iron (0.10 ug/mL), soluble nitrate and nitrite (15.0 and 0.39 ug/mL), and phosphate (4.86 ug/mL); 25°C |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | Not reported; Not reported; Not Reported; Total heterotrophic bacterial population: 3.40±0.70 cfu/g x 10^5 |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | Varian model 3700 gas chromatograph with flame ionization detector; Headspace analyzed, 100 uL samples collected with gas-tight syringe; % test substance degradation; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | Approx. 42%; Not reported; 4 week; Not reported |
| Results Remarks and Results Details | Test substance remaining: 100%/0wk, 89%/1 wk, 69%/2 wk, 59.09%/3wk, 58%/4wk Values reported graphically and are approximate, except for at 3 wk which was reported in text.; Biodegradation rate constant: 0.185±0.00603/wk |
| Results Mean Total Recovery and Results per Recovery | Not applicable; Not reported |

**EVALUATION**

| Domain | Metric | Rating | Comments |
|---|---|---|---|
| Domain 1: Test Substance | | | |
| Metric 1: | Test Substance Identity | High | The test substance was identified definitively by name. |
| Metric 2: | Test Substance Purity | Medium | The test substance source and purity were not reported. |
| Domain 2: Test Design | | | |
| Metric 3: | Study Controls | Medium | A sterile control was included, however the results were not reported. |
| Metric 4: | Test Substance Stability | Medium | Test substance initial concentration was reported, other preparation details were not included. |
| Domain 3: Test Conditions | | | |

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|---|---|
| **Study Citation:** | Olaniran, A. O., Pillay, D., Pillay, B. (2006). Biostimulation and bioaugmentation enhances aerobic biodegradation of dichloroethenes. Chemosphere 63(4):600-608. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 3571750 |

| | | | 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 test conditions and soil details were reported. |
| | Metric 7: | Testing Consistency | High | Test conditions were consistent across samples and study groups. |
| | Metric 8: | System Type and Design | N/A | Not applicable. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | High | Inoculum source reported and appropriate for the study. |
| | 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 and frequency were appropriate. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | Variability was addressed by statistical techniques, no apparent sources of uncertainty 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 | The analytical method was appropriate however mass balance, recovery, and limits of detection were not reported. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | Kinetic calculations were described elsewhere, in LaGrega, M.D., Buckingham, P.L., Evans, J.C., 1994. Growthkinetics. In: Clark, B.J., Morris, J.M. (Eds.), HazardousWaste Management. McGraw Hill Inc. Publishers,p. 581. |
| 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:** | Semprini, L., Hopkins, G. D., Roberts, P. V., Grbic-Galic, D., Mccarty, P. L. (1991). A Field Evaluation of In-Situ Biodegradation of Chlorinated Ethenes: Part 3, Studies of Competitive Inhibition. Groundwater 29(2):239-250. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1741914 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | not reported; trans-1,2-dichloroethylene |
| Confidentiality, EndPoint, Type, Guideline | none; other; experimental; other: Field experiment: In-situ biotransformation of trans-1,2-DCE in a series of stimulus-response tests. |
| Solvent, Reactivity, Storage, Stability | injection fluid; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR Notes: Added as dissolved component of the injection fluid. |
| Blank and Control | Not reported; Control not reported. Ground water chemistry is aquifer was not toxic to indigenous microorganisms. |
| Oxygen and Inoculum | aerobic; Not Reported: Methanotrophic bacteria; stimulation via addition of dissolved methane and oxygen under steady state conditions. S1 well: Methane 2 mg/L and DO 10 mg/L; S2 well: Methane 0.1 mg/L and DO 4.0 mg/L. |
| Duration, Parameter, System, and Sampling Frequency | mean normalized concentrations were calculated over 200 hours.; test mat.: Experiments performed in a shallow confined aquifer.; Data acquisition was performed every 45 minutes; ca. 6 samples per day were obtained at each of 5 monitoring locations. |
| pH Adjusted and pH | no; not reported |
| Concentration | <= 150 µg/L |
| Composition and Test Temperature | Aquifer consisted of sands and gravel; bounded above and below with clay and silt layers.; ambient |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | not reported; not reported; not reported; t-DCE was not previously detected in the native ground waters. |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | not reported; Disappearance of test material; not reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | disappearance (transformation) of t-DCE was not observed; not reported; 820 hours; Biostimulation with methane resulted in 83-89% disappearance of t-DCE; biostimulation with formate resulted in 94% disappearance of t-DCE |
| Results Remarks and Results Details | Biostimulation experiment TEST 1 (DO and methane; end of methane addition, evaluation period 270-330 hours):S1 well: rapid decline of 40% was observed over the first 24 hours. S2 well: Decrease in normalized concentration of t-DCE (C/Co): 1.0 (t=0 hrs) to ca. 0.18 (t=200 hrs); rapid decline was observed over the first 50-80 hours.S3 well: Decrease in normalized concentration of t-DCE (C/Co): 0.85 (t=0 hrs) to ca. 0.1 (t=200 hrs)Without biostimulation TEST 5 (No electron donor addition, methane addition terminated at 775h; evaluation period 790-820 hours)S1 well: Increase in normalized concentration of t-DCE (C/Co): ca. 0.07 (t=790 hours) to ca. 0.39 (t=820 hours); percent transformation estimated from: (1-C/Co)*100% |
| 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 | The test substance source was not reported. |
| Domain 2: Test Design | | | | |

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|---|---|
| **Study Citation:** | Semprini, L., Hopkins, G. D., Roberts, P. V., Grbic-Galic, D., Mccarty, P. L. (1991). A Field Evaluation of In-Situ Biodegradation of Chlorinated Ethenes: Part 3, Studies of Competitive Inhibition. Groundwater 29(2):239-250. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1741914 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 3: | Study Controls | Medium | 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 | | | | |
| | Metric 5: | Test Method Suitability | High | The test method was suitable for the test substance. |
| | Metric 6: | Testing Conditions | Low | Field conditions and characteristics were cited to previous papers. |
| | Metric 7: | Testing Consistency | High | Testing was consistent. |
| | Metric 8: | System Type and Design | High | The system type and design was appropriate. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | High | Field study (methanotrophic bacteria). |
| | 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 | Sampling methods were appropriate. |
| 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 | Low | Analytical details were omitted. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | High | Statistical methods was 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 the study type. |

## Overall Quality Determination — High

| | |
|---|---|
| **Study Citation:** | Semprini, L., Roberts, P. V., Hopkins, G. D., Mccarty, P. L. (1990). A field evaluation of in situ biodegradation of chlorinated ethenes: Part 2. Results of biostimulation and biotransformation experiments. Groundwater 28(5):715-727. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1741676 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | Not Reported; trans-1,2-Dichloroethene |
| Confidentiality, EndPoint, Type, Guideline | none; other; experimental; other: Non-guideline: field study |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR Notes: NR |
| Blank and Control | not reported; not reported |
| Oxygen and Inoculum | aerobic; natural water / sediment: freshwater: Indigenous methane-oxidizing bacteria collected from a saturated, semi-confined aquifer. Target chemicals were not previously detected in site groundwater. |
| Duration, Parameter, System, and Sampling Frequency | 600 hours; test mat.: Well field site located at the Moffett Naval Air Station, Mountain View, CA; experiments performed under induced-gradient conditions created via continuous injection and extraction of groundwater and measured concentrations of test chemical.; not reported |
| pH Adjusted and pH | not reported; not reported |
| Concentration | = 50 (average) - <= 112 µg/L |
| Composition and Test Temperature | Test zone contains sands and gravels, and is highly permeable with suitable ground-water chemistry and methanotrophic bacteria.; not reported |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | not reported; not reported; not reported; Stimulus for degradation was the continuous injection of test chemicals; response was evaluating the concentration history in groundwater at monitoring and extraction wells. The initial 'First season' was conducted by introducing methane and oxygen to initiate biostimulation of the indigenous bacteria, followed by introduction of TCE. The second season introduced additional halogenated carbons (cis-DCE, trans-DCE) and a bromide tracer. |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | not reported; comparison with bromide fractional breakthroughs; comparison with fractional breakthrough before biostimulation (%biotransformed = (1-C sub forg/C sub fbr)x100% where C sub forg is normalized breakthrough of organic solute after biostimulation and C sub fbr is the mean normalized breakthrough of bromide tracer; not reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | Second season with biostimulation: 61-76%; 55-72%. Third season with biostimulation: 83-97%; 81-94%; 95% CI reported; values collected during first 200 hours; not reported |
| Results Remarks and Results Details | Biostimulation of methane-utilizing bacteria appears to be required for the biotransformation of trans-1,2-CDE. trans-DCE epoxide identified as an intermediate formed; however, formation was not observed when methane addition was stopped. Partial transformation of 80-90% was observed over 1-2 meters with fluid residence times of 1-2 days.; not reported |
| Results Mean Total Recovery and Results per Recovery | Second season: ND; Third season: 64-76%; 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 | The source and purity of the test substance were not reported. |
| Domain 2: Test Design | | | |

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|---|---|
| **Study Citation:** | Semprini, L., Roberts, P. V., Hopkins, G. D., Mccarty, P. L. (1990). A field evaluation of in situ biodegradation of chlorinated ethenes: Part 2. Results of biostimulation and biotransformation experiments. Groundwater 28(5):715-727. |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 1741676 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 3: | Study Controls | N/A | The metric is not applicable to this type of study. |
| | Metric 4: | Test Substance Stability | Medium | The test substance stability, homogeneity, 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 | Low | Limited detail regarding this metric. |
| | Metric 7: | Testing Consistency | N/A | The metric is not applicable to this type of study. |
| | Metric 8: | System Type and Design | High | Steady-state or quasi-steady-state conditions established. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | High | The test organism information was reported. |
| | 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 | Low | Biodegradation rate without biostimulation was not reported; however, a degradation product was reported. |
| | Metric 12: | Test Substance Purity | Medium | Limited detail regarding this metric. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Limited detail regarding this metric. |
| | 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 methodology was omitted. |
| | 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 type of study. |

## Overall Quality Determination — Medium

| | |
|---|---|
| **Study Citation:** | U.S. EPA, (2015). Screening level hazard characterization: Sponsored chemical trans-1,2-dichloroethylene (CASRN 156-60-5). |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5113342 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; Trans 1,2-Dichloroethylene |
| 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 | NR; NR; NR; NR |
| Blank and Control | NR; NR |
| Oxygen and Inoculum | aerobic; not specified |
| Duration, Parameter, System, and Sampling Frequency | 28 days; NR: NR; NR |
| pH Adjusted and pH | NR; NR |
| Concentration | 6 - mg/L |
| Composition and Test Temperature | NR; NR |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | NR; NR; NR; Not Reported |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | NR; BOD; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | 8; Not Reported; 28 days; NR |
| Results Remarks and Results Details | Not Reported; NR |
| Results Mean Total Recovery and Results per Recovery | NR; NR |

**EVALUATION**

| Domain | Metric | | Rating | Comments |
|---|---|---|---|---|
| Domain 1: Test Substance | | | | |
| | Metric 1: | Test Substance Identity | High | The test substance was identified by name. |
| | Metric 2: | Test Substance Purity | Medium | The test substance source and purity were not reported in the secondary source. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Medium | Concurrent control group details were not reported in the secondary source. |
| | Metric 4: | Test Substance Stability | Medium | Test substance stability, homogeneity, preparation, and storage conditions were not reported in the secondary source. |
| Domain 3: Test Conditions | | | | |

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|---|---|
| **Study Citation:** | U.S. EPA, (2015). Screening level hazard characterization: Sponsored chemical trans-1,2-dichloroethylene (CASRN 156-60-5). |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5113342 |

| Domain | | Metric | EVALUATION Rating | Comments |
|---|---|---|---|---|
| | Metric 5: | Test Method Suitability | Medium | Test method details were not reported in the secondary source however there is no indication that the methodology for producing the information was biased towards a particular outcome. |
| | Metric 6: | Testing Conditions | Medium | Testing conditions are unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognize d database or other secondary source. |
| | Metric 7: | Testing Consistency | Medium | Testing consistency is unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 8: | System Type and Design | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | The inoculum is unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 10: | Sampling Methods | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Medium | The outcome assessment methodology is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 12: | Test Substance Purity | Medium | Sampling methodology is unknown is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Sources of variability and uncertainty were not reported in the secondary source. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | 14.Rating of this factor is not applicable to this kind of information. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Medium | Limited data is reported in the secondary source but study data are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | N/A | No statistical methods or kinetic calculations were reported in the secondary source. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Medium | The results are reasonable based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 18: | QSAR Models | N/A | Rating of this factor is not applicable to this kind of information. |

## Overall Quality Determination Medium

* Related References: Grey lit value; No citation reported.

| | |
|---|---|
| **Study Citation:** | U.S. EPA, (2015). Screening level hazard characterization: Sponsored chemical trans-1,2-dichloroethylene (CASRN 156-60-5). |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5113342 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; Not Reported |
| 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 | NR; NR; NR; NR |
| Blank and Control | NR; NR |
| Oxygen and Inoculum | aerobic; not specified |
| Duration, Parameter, System, and Sampling Frequency | 28 days; NR: NR; NR |
| pH Adjusted and pH | NR; NR |
| Concentration | 2.32 - 6.06 mg/L |
| Composition and Test Temperature | NR; NR |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | NR; NR; NR; Not Reported |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | NR; BOD; Not Reported |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | 0; Not Reported; 28 days; NR |
| Results Remarks and Results Details | Not Reported; NR |
| Results Mean Total Recovery and Results per Recovery | NR; NR |

**EVALUATION**

| Domain | Metric | | Rating | Comments |
|---|---|---|---|---|
| Domain 1: Test Substance | | | | |
| | Metric 1: | Test Substance Identity | High | The test substance was identified by name. |
| | Metric 2: | Test Substance Purity | Medium | The test substance source and purity were not reported in the secondary source. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Medium | Concurrent control group details were not reported in the secondary source. |
| | Metric 4: | Test Substance Stability | Medium | Test substance stability, homogeneity, preparation, and storage conditions were not reported in the secondary source. |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | Medium | Test method details were not reported in the secondary source however there is no indication that the methodology for producing the information was biased towards a particular outcome. |

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|---|---|
| **Study Citation:** | U.S. EPA, (2015). Screening level hazard characterization: Sponsored chemical trans-1,2-dichloroethylene (CASRN 156-60-5). |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5113342 |

| | | **EVALUATION** | | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 6: | Testing Conditions | Medium | Testing conditions are unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 7: | Testing Consistency | Medium | Testing consistency is unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 8: | System Type and Design | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | The inoculum source is unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognize d database or other secondary source. |
| | Metric 10: | Sampling Methods | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Medium | The outcome assessment methodology is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 12: | Test Substance Purity | Medium | Sampling methodology is unknown is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Sources of variability and uncertainty were not reported in the secondary source. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Medium | Limited data is reported in the secondary source but study data are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | N/A | No statistical methods or kinetic calculations were reported in the secondary source. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Medium | The results are reasonable based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 18: | QSAR Models | N/A | Rating of this factor is not applicable to this kind of information |

## Overall Quality Determination Medium

* Related References: Cited reference: National Institute of Technology and Evaluation. 2002. Biodegradation and Bioaccumulation of the Existing Chemical Substances under the Chemical Substances Control Law. Available online at http://www.nite.go.jp/en/chem/qsar/cscl_data.html. Extracted under HEROID: 6629394

| | |
|---|---|
| **Study Citation:** | U.S. EPA, (2015). Screening level hazard characterization: Sponsored chemical trans-1,2-dichloroethylene (CASRN 156-60-5). |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5113342 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 150-60-5; trans 1,2-dichloroethylene |
| Confidentiality, EndPoint, Type, Guideline | None; NR; Experimental; other: NR |
| 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 | aerobic; other:: Settled sewage sludge amended with yeast extracts |
| Duration, Parameter, System, and Sampling Frequency | 28 days; NR: NR; NR |
| pH Adjusted and pH | NR; NR |
| Concentration | NR NR - NR NR NR |
| Composition and Test Temperature | NR; NR |
| CEC, Water Aeration Dilution, Continuous Darkness, and Other Design | NR; NR; NR; NR |
| Results Details Method, Results per Degradation Parameter, and Direct Quantum Yield Results | NR; Test substance loss; NR |
| Results Value, Results Standard Deviation, Results Sample Time, and Results Reference Substance Compartments | 93-95%; Not Reported; 28 days; Not Reported |
| Results Remarks and Results Details | 26-33% loss due to volatilization; NR |
| Results Mean Total Recovery and Results per Recovery | NR; NR |

**EVALUATION**

| Domain | Metric | Rating | Comments |
|---|---|---|---|
| Domain 1: Test Substance | | | |
| Metric 1: | Test Substance Identity | High | The test substance was identified by name. |
| Metric 2: | Test Substance Purity | Medium | The test substance source and purity were not reported in the secondary source. |
| Domain 2: Test Design | | | |
| Metric 3: | Study Controls | Medium | Concurrent control group details were not reported in the secondary source. |
| Metric 4: | Test Substance Stability | Medium | Test substance stability, homogeneity, preparation, and storage conditions were not reported in the secondary source. |
| Domain 3: Test Conditions | | | |
| Metric 5: | Test Method Suitability | Medium | Test method details were not reported in the secondary source however there is no indication that the methodology for producing the information was biased towards a particular outcome. |

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|---|---|
| **Study Citation:** | U.S. EPA, (2015). Screening level hazard characterization: Sponsored chemical trans-1,2-dichloroethylene (CASRN 156-60-5). |
| **OECD Harmonized Template:** | Biodegradation in Water |
| **HERO ID:** | 5113342 |

| | | **EVALUATION** | | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 6: | Testing Conditions | Medium | Testing conditions are unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 7: | Testing Consistency | Medium | Testing consistency is unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 8: | System Type and Design | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | The inoculum source is unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognize d database or other secondary source. |
| | Metric 10: | Sampling Methods | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Medium | The outcome assessment methodology is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 12: | Test Substance Purity | Medium | Sampling methodology is unknown is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Sources of variability and uncertainty were not reported in the secondary source. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Medium | Limited data is reported in the secondary source but study data are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | N/A | No statistical methods or kinetic calculations were reported in the secondary source. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Medium | The results are reasonable based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 18: | QSAR Models | N/A | Rating of this factor is not applicable to this kind of information. |

## Overall Quality Determination Medium

* Related References: No citation given. Value reported under HERO ID: 9861

| | |
|---|---|
| **Study Citation:** | Barrio-Lage, G., Parsons, F. Z., Nassar, R. S., Lorenzo, P. A. (1986). Sequential dehalogenation of chlorinated ethenes. Environmental Science & Technology 20(1):96-99. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 66083 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; 1,2-Dichloroethene |
| Confidentiality, EndPoint, Type, Guideline | None; inherent biodegradability; Experimental; other: Anaerobic grab sample microcosms |
| Solvent, Reactivity, Storage, Stability | Water; NR; Vials wrapped in aluminum foil; 4°C; NR |
| Radiolabel, Source, State, Purity | NA; Aldrich Chemical Co, Milwaukee, WI; trans-; 98% |
| Oxygen and Inoculum | anaerobic; natural sediment: freshwater: Shallow canal A: bottom sediment B: near surface sediment. Used in natural state; water from site added |
| Duration, Parameter, System, and Sampling Frequency | 6 mo; other; microcosm; Not reported |
| Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH | dedicated microcosm for each test period; sediment; Not applicable; Not applicable; Not reported; 7.0±0.5 |
| Control Dark, Control, and Blank | yes; Nitrogen-purged control; autoclaved control, no spike and distilled water |
| Concentration | 2180 µg/L |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | GC/MS; Product formation; Redox potential; 9 |
| Results Remarks | Sample A: 1,2-DCE depleted to 560 ug/L after 6 mos; formation of vinyl chloride was 5 ug/L after 6 mos (based on figure). |
| Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results | Not reported; Not reported; Not applicable; Not applicable |
| Results Details | Slow rate of dehalogenation; nearly constant concentration after 2 weeks |
| Mean Total Recovery Results and Results Per Recovery | Not reported; Dechlorination did not occur in sterilized microcosms. Vinyl chloride was not detected in controls (no-spike and sterile). |
| Results Value, Direct Quantum Yield Results, and Transformation Products | first order rate constants: A) 1.97X10-4/hr; B) 2.19X10-4/hr; Not Reported; vinyl chloride |

**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 substance was reported. |
| Domain 2: Test Design | | | |
| Metric 3: | Study Controls | High | Concurrent blank and toxicity controls were included. |
| Metric 4: | Test Substance Stability | High | Test substance stability, homogeneity, preparation and storage conditions were reported. |
| Domain 3: Test Conditions | | | |

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|---|---|
| **Study Citation:** | Barrio-Lage, G., Parsons, F. Z., Nassar, R. S., Lorenzo, P. A. (1986). Sequential dehalogenation of chlorinated ethenes. Environmental Science & Technology 20(1):96-99. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 66083 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | Metric | | Rating | Comments |
| | Metric 5: | Test Method Suitability | High | 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 study groups. The conditions of the exposure were documented. |
| | 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 | High | The inoculum source was reported and routinely used for similar study types and appropriate for the study route. |
| | Metric 10: | Sampling Methods | N/A | The metric is not applicable to this study type. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | High | The outcome assessment methodology addressed 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 for the chemical and media being analyzed. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | Sources of variability and uncertainty in the measurements, and statistical techniques were considered and accounted for in data evaluation. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | The metric is not applicable to this study type. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | High | The target chemical and transformation product concentrations, and extraction efficiency were reported; analytical methods used were suitable for detection and quantification of the target chemical and transformation product. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | High | Statistical methods or kinetic calculations were clearly described and address the dataset. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | High | Reported values were consistent with related physical and chemical properties. |
| | Metric 18: | QSAR Models | N/A | The metric is not applicable to this study type. |

## Overall Quality Determination High

* Related References: HSDB

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|---|---|
| **Study Citation:** | Bradley, P. M. (2007). Dichloroethene and vinyl chloride degradation potential in wetland sediments at twin lakes and pen branch, savannah river national laboratory, South Carolina. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 5436670 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; 1,2-Dichloroethene |
| Confidentiality, EndPoint, Type, Guideline | None; other; Experimental; other: degradation in wetland sediments using laboratory microcosm evaluations |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | uniformly labeled [1,2-14C] DCE; 4 µCi/µ mole; Moravek Biochemicals, Brea, CA; NR; radiochemical purity >98% by GC |
| Oxygen and Inoculum | aerobic/anaerobic; natural water / sediment: freshwater: wetland sediments from the DOE Savannah River National Laboratory, collected in Sept 2004. Inoculum pre-adaption likely, but not explicit in paper. Wells with CMP prefix were identified as downgradient of "potential discharge of chloroethene-contaminated ground water". CMP is not defined in this paper, but likely stands for Chemicals, Metals, and Pesticides, a monitored RCRA site. Monitoring in 2020 found PERC, TCE, and cis-1,2-DCE in wells (CMP-39, 40, 41) where the sediment was collected. C-BRP may stand for C-area Burning/Rubble Pit, and is also likely a chloroethene-contaminated/preadapted. |
| Duration, Parameter, System, and Sampling Frequency | 60 days; measured test material; 10 mL serum vials; Not reported |
| Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH | Not reported; Not reported; 10±0.5 g saturated sediment; Not reported; Not reported; Not reported |
| Control Dark, Control, and Blank | yes; Not reported; duplicate autoclaved controls |
| Concentration | 280 µg/L |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | Headspace analysis via GC with sequential radiometric detection and thermal conductivity detection; Not Reported; 2 |
| Results Remarks | Oxic: 50±2%, 52±6%, 35±3% and 54±12% ThCO2 (sediments from CRP-42, CRP-45, CRP-46 and CRP-49 wells, respectively) and 58±11%, 60±3% and 46±4% (sediments from CMP-39, CMP-40 and CMP-41, respectively) after 60 days; Anoxic: 19±10%, 40±8%, 20±6% and 36±6% ThCO2 (sediments from CRP-42, CRP-45, CRP-46 and CRP-49, respectively) and 20±2%, 18±2% and 16±2% (sediments from CMP-39, CMP-40 and CMP-41, respectively) after 60 days |
| Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results | Not reported; See value; Controls; no significant 14C-product accumulation was observed in autoclaved control or sediment-free control microcosms |
| Results Details | CRP-42 organic silt/clay, 10±0% organic content; CRP-45 organic silt/clay, 23±1% organic content; CRP-46: organic silt/clay, 21±1% organic content; CRP-49 sand, 0.2±0.1% organic content; CMP-39 sand/gravel, 0.1±0.0% organic content; CMP-40 organic sand, 2±1% organic content; CMP-41 organic silty/clay, 15±1% organic content |
| Mean Total Recovery Results and Results Per Recovery | Not reported; Not reported |
| Results Value, Direct Quantum Yield Results, and Transformation Products | Oxic: degradation ranged from 35±3 to 60±3% ThCO2 after 60 days; Anoxic: degradation ranged from 16±2 to 40±8% ThCO2 after 60 days; Not Reported; mineralization products 14CO2 and 14CH4; in anoxic conditions 14C-vinyl chloride was a major transformation product, 14C-ethene was detected under anoxic conditions in 4 sediments CRP-42, 45, 46, and 49 |

**EVALUATION**

| Domain | Metric | Rating | Comments |
|---|---|---|---|
| Domain 1: Test Substance | | | |

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|---|---|
| **Study Citation:** | Bradley, P. M. (2007). Dichloroethene and vinyl chloride degradation potential in wetland sediments at twin lakes and pen branch, savannah river national laboratory, South Carolina. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 5436670 |

| | | **EVALUATION** | | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 1: | Test Substance Identity | Low | No CASRN was supplied, and while the name dichloroethene or DCE are used throughout, implying a racemic mixture, the abstract refers to cis-DCE and the abbreviations table on page 6 of the PDF say DCE means ”cis-dichloroethene”. Thus there is uncertainty and perhaps conflicting information as to the stereoisomer or stereo isomers used. |
| | 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. |
| | Metric 4: | Test Substance Stability | Medium | Test substance preparation and stock solution stability 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 | Low | Test conditions and some sediment characteristics were not 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 | Low | The natural sediment source was reported but was likely pre-adapted to the test substance and other chloroethenes. |
| | 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 reported. |
| | Metric 12: | Test Substance Purity | Low | Sampling methods not 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 | Medium | Analytical method had limited detail. |
| | 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 | Reported values were within expected range as defined by reference substance(s). |

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|---|---|
| **Study Citation:** | Bradley, P. M. (2007). Dichloroethene and vinyl chloride degradation potential in wetland sediments at twin lakes and pen branch, savannah river national laboratory, South Carolina. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 5436670 |

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

## Overall Quality Determination Medium

| | |
|---|---|
| **Study Citation:** | Janssen, D. B., Grobben, G., Hoekstra, R., Oldenhuis, R., Witholt, B. (1988). DEGRADATION OF TRANS-1 2 DICHLOROETHENE BY MIXED AND PURE CULTURES OF METHANOTROPHIC BACTERIA. Applied Microbiology and Biotechnology 29(4):392-399. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 2310675 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | not reported; trans-1,2-Dichloroethene |
| Confidentiality, EndPoint, Type, Guideline | none; other; experimental; other: Non-guideline: cometabolic degradation using mixed cultures of methanotrophic bacteria |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; Janssen Chimica, Beerse, Belgium; NR; ≥97% Notes: NR |
| Oxygen and Inoculum | not specified; other: The mixed methanotrophic culture was isolated from freshwater lake sediment near Groningen (Paterswoldsemeer); organisms were obtained from late exponential growth cultures, washed with and suspended in 10mM potassium phosphate buffer pH 7.0, and used for oxygen consumption experiments. |
| Duration, Parameter, System, and Sampling Frequency | 4 days; O2 consumption; biological oxygen monitor; not specified |
| Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH | not specified; not reported; not reported; Mineral medium; Cultures incubated in the presence of methane; not reported; not specified |
| Control Dark, Control, and Blank | not specified; toxicity was assessed by incubation with methanol (no toxicity observed at 0.1 mmol/L medium) or methane (no toxicity observed at 0.1 mmol/L medium) at 30°C; not specified |
| Concentration | = 0.1 - = 1.0 other: mmol/L of culture volume |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | GC with authentic standards, H-NMR for intermediate analysis, ion-selective electrode or colorimetry assays for chloride; not reported; test mat. |
| Results Remarks | Rapid cometabolic degradation was observed at concentrations up to 0.25 mmol/L. Bacterial growth was inhibited at concentrations that exceeded 0.7 mmol/L culture. Primary degradation to the intermediate, trans-2,3-dichlorooxirane, was observed with levels of t-1,2-DCE below the detection limit after 20 hours. Degradation of the intermediate proceeded via chemical transformation (based on similar results in poisoned control) with a half-life of 31 hours. |
| Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results | Intermediate half-life = 31 hours (abiotic); not reported; A specific reference substance (positive control) was not reported; additional chlorinated aliphatic hydrocarbons were evaluated; No degradation was observed for other chlorinated substances tested. |
| Results Details | Degradation rate: 0.4 µmol/mg protien·hour |
| 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; A slightly volatile, polar metabolite was observed and identified as the intermediate trans-2,3-dichlorooxirane; chemical conversion to inorganic chloride with a half-life = 31 hours |

**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 | High | The source and purity of the test substance were reported. |

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|---|---|
| **Study Citation:** | Janssen, D. B., Grobben, G., Hoekstra, R., Oldenhuis, R., Witholt, B. (1988). DEGRADATION OF TRANS-1 2 DICHLOROETHENE BY MIXED AND PURE CULTURES OF METHANOTROPHIC BACTERIA. Applied Microbiology and Biotechnology 29(4):392-399. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 2310675 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Medium | Some concurrent control group details were not reported (abiotic control details omitted); 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 | Low | The test method was suitable for the test substance with minor deviations; concentrations were reported as "lower because of partitioning between gas and liquid phases", and concentration data was not specifically corrected for this behavior. |
| | Metric 6: | Testing Conditions | Medium | Limited detail regarding this metric. |
| | Metric 7: | Testing Consistency | High | Reported test conditions were consistent. |
| | Metric 8: | System Type and Design | Medium | Limited detail regarding this metric. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | High | The test organism information 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 were minor differences between the assessment methodology and the intended outcome assessment; however, primary biodegradation rate was reported, and an intermediate degradation product was identified. |
| | Metric 12: | Test Substance Purity | Low | Details regarding sampling methods of the outcome were not fully reported. |
| 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 | Low | Concentrations of the target chemical and transformation product, extraction efficiency, percent recovery, or mass balance were not fully reported, preventing meaningful interpretation of quantitative results. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Low | Limited detail regarding this metric. |

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|---|---|
| **Study Citation:** | Janssen, D. B., Grobben, G., Hoekstra, R., Oldenhuis, R., Witholt, B. (1988). DEGRADATION OF TRANS-1 2 DICHLOROETHENE BY MIXED AND PURE CULTURES OF METHANOTROPHIC BACTERIA. Applied Microbiology and Biotechnology 29(4):392-399. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 2310675 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| 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:** | Lorah, M. M., Olsen, L. D. (1998). Anaerobic and aerobic biodegradation of chlorinated solvents in a freshwater wetland. :27-32. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 1964413 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-Dichloroethylene |
| Confidentiality, EndPoint, Type, Guideline | None; other; Experimental; other: Biodegradation in freshwater wetland; aerobic microcosms |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR |
| Oxygen and Inoculum | aerobic; natural sediment: freshwater: sediment and ground water from a freshwater wetland at Aberdeen; 3:2 volumetric ratio of ground water to sedimentProving Ground, Maryland |
| Duration, Parameter, System, and Sampling Frequency | 48 days; other; sealed serum bottles; select time intervals |
| Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH | Not reported; headspace analysis; Not reported; Not reported; Not reported; Not reported |
| Control Dark, Control, and Blank | yes; Not reported; Sterile control using 1% by volume formaldehyde and control using dimethyl, a specific inhibitor of methanotrophic activity |
| Concentration | 1000 µg/L |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | GC/MS (VOCs) and GC/FID (methane); Not reported; Not Reported |
| Results Remarks | difficult to establish aerobic conditions in themicrocosms; methane concentrations increased during the first 18 to 25 days of incubation |
| Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results | 5.3-7.7 days; Not reported; Controls; If abiotic losses of greater than 5% were observed in the sterile controls, calculations were adjusted to include only the losses due to biodegradation. |
| Results Details | Aerobic degradation rates ranged from 0.13 to 0.09 day-1 (corresponding to half-life of 5.3 to 7.7 days); First order kinetics rate constant determined from slope of linear regression of the natural logarithm of the fraction of the initial concentration remaining in the nonsterile microcosms against time of incubation |
| 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; 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. |

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|---|---|
| **Study Citation:** | Lorah, M. M., Olsen, L. D. (1998). Anaerobic and aerobic biodegradation of chlorinated solvents in a freshwater wetland. :27-32. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 1964413 |

**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 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 appropriate. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | Inoculum source was reported; microbial activity was not assesses/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 | High | Sampling methods were appropriate. |
| 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 the analytical methods. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | Statistical analysis was not 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

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|---|---|
| **Study Citation:** | NCBI, (2020). PubChem database: compound summary: trans-1,2-Dichloroethylene. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 6629394 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; other; Experimental; other |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR |
| Oxygen and Inoculum | anaerobic; other: methanogenic aquifer material obtained adjacent to a landfill site |
| Duration, Parameter, System, and Sampling Frequency | 40 weeks; test mat.; serum bottle at 17 deg C; Not reported |
| 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 | Not Reported; Not reported; Autoclaved controls included |
| Concentration | Not Reported |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | Not reported; Not reported; test material |
| Results Remarks | The average concentration of the trans-isomer was reduced to 18% of controls after 40 weeks. |
| Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results | Not reported; Not reported; Not reported; Not reported |
| Results Details | 16 weeks of incubation passed before disappearance began relative to autoclaved controls. |
| 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; vinyl chloride was identified after 1-2 wks; no degradation products were found after 40 wks |

**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 | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| Domain 2: Test Design | | | |
| Metric 3: | Study Controls | High | Controls were included with limited detail reported in source; however, additional information may be included in the primary source. |
| Metric 4: | Test Substance Stability | Medium | Detail regarding this metric were not reported; however, additional information may be included in the primary source. |

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**Study Citation:** NCBI, (2020). PubChem database: compound summary: trans-1,2-Dichloroethylene.
**OECD Harmonized Template:** Biodegradation in Sediment
**HERO ID:** 6629394

| Domain | Metric | | EVALUATION Rating | Comments |
|---|---|---|---|---|
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | Medium | Detail regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 6: | Testing Conditions | Medium | Detail regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 7: | Testing Consistency | Medium | Detail regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 8: | System Type and Design | Medium | Detail regarding this metric were not reported; however, additional information may be included in the primary source. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | Detail regarding this metric were limited; however, additional information may be included in the primary source. |
| | Metric 10: | Sampling Methods | N/A | The metric is not applicable to this study type. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Medium | Detail regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 12: | Test Substance Purity | Medium | Detail regarding this metric were not reported; however, additional information may be included in the primary source. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Detail regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | This metric is not applicable to this type of study. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Medium | Detail regarding this metric were limited; however, additional information may be included in the primary source. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | Detail regarding this metric were not reported; however, additional information may be included in the primary source. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Medium | Due to limited information, evaluation of the reasonableness of the study results was not possible; however, additional information may be included in the primary source. |
| | Metric 18: | QSAR Models | N/A | This metric is not applicable to this type of study. |

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|---|---|
| **Study Citation:** | NCBI, (2020). PubChem database: compound summary: trans-1,2-Dichloroethylene. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 6629394 |

**EVALUATION**

| Domain | Metric | Rating | Comments |
|---|---|---|---|
| **Overall Quality Determination** | | **Medium** | |

* Related References: Wilson BH et al; Environ Sci Technol 20: 997-1002 (1986), HSDB

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|---|---|
| **Study Citation:** | NCBI, (2020). PubChem database: compound summary: trans-1,2-Dichloroethylene. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 6629394 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; other; Experimental; other: Anaerobic microcosms |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR |
| Oxygen and Inoculum | anaerobic; natural sediment: uncontaminated organic sediment from the Everglades |
| Duration, Parameter, System, and Sampling Frequency | 6 months; not specified; Not reported; Not reported |
| 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 | Not Reported; Not reported; Not reported |
| Concentration | Not Reported |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | Not reported; Not reported; test material |
| Results Remarks | Not reported |
| Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results | Not reported; test mat. analysis; 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 | 73%; Not Reported; vinyl chloride |

**EVALUATION**

| Domain | Metric | Rating | Comments |
|---|---|---|---|
| Domain 1: Test Substance | | | |
| | Metric 1: Test Substance Identity | Medium | The test substance was identified by name, but the isomer was not specified. Results are reported for both isomers therefore, it's unclear if the test was conducted with each specifically or a mixture. |
| | Metric 2: Test Substance Purity | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| Domain 2: Test Design | | | |
| | Metric 3: Study Controls | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 4: Test Substance Stability | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |

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|---|---|
| **Study Citation:** | NCBI, (2020). PubChem database: compound summary: trans-1,2-Dichloroethylene. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 6629394 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 6: | Testing Conditions | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 7: | Testing Consistency | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 8: | System Type and Design | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | 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 regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 12: | Test Substance Purity | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | This metric is not applicable to this type of study. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Medium | Degradation parameter not reported; however, additional information may be included in the primary source. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | Details regarding this metric were not reported; however, additional information may be included in the primary source. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Medium | Due to limited information, evaluation of the reasonableness of the study results was not possible; however, additional information may be included in the primary source. |
| | Metric 18: | QSAR Models | N/A | This metric is not applicable to this type of study. |

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|---|---|
| **Study Citation:** | NCBI, (2020). PubChem database: compound summary: trans-1,2-Dichloroethylene. |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 6629394 |

| | | **EVALUATION** | |
|---|---|---|---|
| Domain | Metric | Rating | Comments |
| **Overall Quality Determination** | | **Medium** | |

* Related References: Barrio-Lage G et al; Environ Sci Technol 20: 96-9 (1986), HSDB HEROID:66083

| | |
|---|---|
| **Study Citation:** | U.S. EPA IRIS, (2009). Toxicological Review of cis-1,2-Dichloroethylene and trans-1,2-Dichloroethylene (CAS Nos. cis: 156-592-2: trans- 156-60-5: mixture: 540-59-0). In Support of Summary Information on the Integrated Risk Information System (IRIS). |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 5427406 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; Not Reported |
| Confidentiality, EndPoint, Type, Guideline | Not Reported; anaerobic biodegradation; Not Reported; 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 |
| Oxygen and Inoculum | anaerobic; Not Reported |
| Duration, Parameter, System, and Sampling Frequency | Not Reported; Not Reported; Not Reported; Not Reported |
| 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 | Not Reported; Not Reported; Not Reported |
| Concentration | Not Reported |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | Not Reported; Not Reported; Not Reported |
| Results Remarks | The cis-isomer is degraded more readily than the trans-isomer. The rates of degradation of both isomers are dependent on the availability of an electron donor and the presence of active anaerobes. |
| 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; trans-1,2-dichloroethylene biodegraded to only vinyl chloride |

**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 in the secondary source. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Medium | Concurrent control group details were not reported in the secondary source. |
| | Metric 4: | Test Substance Stability | Medium | Test substance stability, homogeneity, preparation, and storage conditions were not reported in the secondary source. |

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|---|---|
| **Study Citation:** | U.S. EPA IRIS, (2009). Toxicological Review of cis-1,2-Dichloroethylene and trans-1,2-Dichloroethylene (CAS Nos. cis: 156-592-2: trans- 156-60-5: mixture: 540-59-0). In Support of Summary Information on the Integrated Risk Information System (IRIS). |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 5427406 |

| | | | **EVALUATION** | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | Medium | Test method details were not reported in the secondary source however there is no indication that the methodology for producing the information was biased towards a particular outcome. |
| | Metric 6: | Testing Conditions | Medium | Testing conditions are unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 7: | Testing Consistency | Medium | Testing consistency is unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 8: | System Type and Design | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | The inoculum source is unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognize d database or other secondary source. |
| | Metric 10: | Sampling Methods | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Medium | The outcome assessment methodology is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 12: | Test Substance Purity | Medium | Sampling methodology is unknown is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Sources of variability and uncertainty were not reported in the secondary source. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Medium | Limited data is reported in the secondary source but study data are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | No statistical methods or kinetic calculations were reported in the secondary source. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Medium | The results are reasonable based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 18: | QSAR Models | N/A | Rating of this factor is not applicable to this kind of information. |

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|---|---|
| **Study Citation:** | U.S. EPA IRIS, (2009). Toxicological Review of cis-1,2-Dichloroethylene and trans-1,2-Dichloroethylene (CAS Nos. cis: 156-592-2: trans- 156-60-5: mixture: 540-59-0). In Support of Summary Information on the Integrated Risk Information System (IRIS). |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 5427406 |

| | | **EVALUATION** | |
|---|---|---|---|
| Domain | Metric | Rating | Comments |
| **Overall Quality Determination** | | **Medium** | |

* Related References: Value reported under HERO ID 66083

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|---|---|
| **Study Citation:** | U.S. EPA, (2015). Screening level hazard characterization: Sponsored chemical trans-1,2-dichloroethylene (CASRN 156-60-5). |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 5113342 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; Not Reported |
| Confidentiality, EndPoint, Type, Guideline | None; Other; Experimental; other: NR |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR |
| Oxygen and Inoculum | anaerobic; sediment (not specified): organic sediment from the Florida Everglades |
| Duration, Parameter, System, and Sampling Frequency | NR; Not Reported; NR; NR |
| Results Sample Time, Compartment, Sludge Compartment, Water Compartment, CEC, and pH | 6 months; Not Reported; Sediment from the Florida Everglades; Not Reported; NR; NR |
| Control Dark, Control, and Blank | NR; NR; NR |
| Concentration | Not Reported |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | NR; Not Reported; Test substance loss |
| Results Remarks | Not Reported |
| Halflife, Standard Deviation Results, Reference Substance Results, and Reference Substance Compartment Results | NR; Not Reported; NR; NR |
| Results Details | Not Reported |
| Mean Total Recovery Results and Results Per Recovery | NR; NR |
| Results Value, Direct Quantum Yield Results, and Transformation Products | 73; Not Reported; Vinyl chloride |

**EVALUATION**

| Domain | Metric | Rating | Comments |
|---|---|---|---|
| Domain 1: Test Substance | | | |
| Metric 1: | Test Substance Identity | High | Substance was identified by name. |
| Metric 2: | Test Substance Purity | Medium | The test substance source and purity were not reported in the secondary source. |
| Domain 2: Test Design | | | |
| Metric 3: | Study Controls | Medium | Concurrent control group details were not reported in the secondary source. |
| Metric 4: | Test Substance Stability | Medium | Test substance stability, homogeneity, preparation, and storage conditions were not reported in the secondary source. |
| Domain 3: Test Conditions | | | |

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|---|---|
| **Study Citation:** | U.S. EPA, (2015). Screening level hazard characterization: Sponsored chemical trans-1,2-dichloroethylene (CASRN 156-60-5). |
| **OECD Harmonized Template:** | Biodegradation in Sediment |
| **HERO ID:** | 5113342 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 5: | Test Method Suitability | Medium | Test method details were not reported in the secondary source however there is no indication that the methodology for producing the information was biased towards a particular outcome. |
| | Metric 6: | Testing Conditions | Medium | Testing conditions are unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 7: | Testing Consistency | Medium | Testing consistency is unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 8: | System Type and Design | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | The inoculum source is unknown but are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognize d database or other secondary source. |
| | Metric 10: | Sampling Methods | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Medium | The outcome assessment methodology is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 12: | Test Substance Purity | Medium | Sampling methodology is unknown is unknown but is likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Sources of variability and uncertainty were not reported in the secondary source. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | Rating of this factor is not applicable to this kind of information. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Medium | Limited data is reported in the secondary source but study data are likely to be appropriate based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | N/A | No statistical methods or kinetic calculations were reported in the secondary source. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Medium | The results are reasonable based on the data's inclusion in a peer- reviewed/recognized database or other secondary source. |
| | Metric 18: | QSAR Models | N/A | Rating of this factor is not applicable to this kind of information |

## Overall Quality Determination — Medium

* Related References: Citation: Hazardous Substance Databank. 2011. trans 1,2-Dichloroethylene (CASRN 156-60-5). Available online at http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB as of December 13, 2011. Previously extracted under HEROID 6629394

| | |
|---|---|
| **Study Citation:** | Henson, J. M., Yates, M. V., Cochran, J. W., Shackleford, D. L. (1988). Microbial removal of halogenated methanes ethanes and ethylenes in an aerobic soil exposed to methane. FEMS Microbiology Ecology 54(3-4):193-201. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 1742839 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; t-1,2-DCE |
| Confidentiality, EndPoint, Type, Guideline | None; other; Experimental; other: Not reported |
| Solvent, Reactivity, Storage, Stability | Sterile deionized water; NR; 160 mL serum bottles sealed with sterile Teflon-lined silicone septum with aluminum crimp and covered with aluminum foil; NR |
| Radiolabel, Source, State, Purity | NR; Aldrich Chemical Company (Milwaukee, WI) or chemical reference kit by Chem Service, Inc. (West Chester, PA); NR; >99% |
| Oxygen, pH, and CEC | other; 6.8 (buffered with minimal salt solution); Not reported |
| Test Type, Test Temperature, and Test Details | laboratory; 25°C; 10 g soil amended with 10 mL sterile medium and aqueous test solution; 12% v/v methane injected into headspace; test systems shaken in the dark |
| Soil Type, Clay Silts and Organic Carbon, and Bulk Density | sand; TOC 0.299±0.010; Not reported |
| Soil Classification, Microbial Biomass, and Humidity | Lincoln fine sand (mixed, thermic, typic Ustifluvent); Number of bacteria present: 3.8E10 g-1 (control sand) 2.4E11 g-1 (methane amended sand): Not reported |
| Duration, Parameter, System, and Sampling Frequency | 6 d; test mat.; 27 mL serum tubes sealed with Teflon-lined silicone septa with aluminum crimps; 0, 3, 6 d |
| Control and Blank | Test systems without methane headspace; Autoclaved soil |
| Concentration | 160 - 165 µg/L |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | Purge-and-trap capillary gas chromatography; Aqueous supernatant analyzed; Test substance disappearance |
| Results Remarks | Not Reported |
| Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results | 58; 8.0; 6 d; Autoclaved soil; No significant loss |
| Results Details | Replicate 1: Approx. 0%/0d, 38%/3d, 59%/6dReplicate 2: Approx. 0%/0d, 52%/3d, 60%/6d |
| Mean Total Recovery Results and Results Per Recovery | Not reported; Not reported |

**EVALUATION**

| Domain | | Metric | Rating | Comments |
|---|---|---|---|---|
| Domain 1: Test Substance | | | | |
| | Metric 1: | Test Substance Identity | High | The test substance was identified by name. |
| | Metric 2: | Test Substance Purity | High | The source and purity of the test substance was reported. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | High | Autoclaved controls were included and no significant loss was observed. |
| | Metric 4: | Test Substance Stability | High | Test substance preparation and storage conditions were reported. |

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|---|---|
| **Study Citation:** | Henson, J. M., Yates, M. V., Cochran, J. W., Shackleford, D. L. (1988). Microbial removal of halogenated methanes ethanes and ethylenes in an aerobic soil exposed to methane. FEMS Microbiology Ecology 54(3-4):193-201. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 1742839 |

| | | | **EVALUATION** | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | High | The test method was suitable for the test substance. |
| | Metric 6: | Testing Conditions | Medium | Some soil characteristics were not reported (percent sand, clay, silt). |
| | Metric 7: | Testing Consistency | High | Test conditions were consistent across samples and study groups. |
| | Metric 8: | System Type and Design | N/A | This metric is not applicable to the study type. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | High | The inoculum source was reported and is commonly used for similar study types. |
| | 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 was appropriate for determining biodegradation loss. |
| | Metric 12: | Test Substance Purity | High | Sampling methods were appropriate and samples were collected at an acceptable frequency. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | No significant sources of uncertainty were identified. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | This metric is not applicable to the study type. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Medium | The analytical method was appropriate; extraction efficiency and limits of detection were not reported. Degradation kinetics reported graphically. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | High | Statistical methods were described and applied appropriately. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | High | The results were reasonable based on the method. |
| | Metric 18: | QSAR Models | N/A | This metric is not applicable to the study type. |

## Overall Quality Determination — High

| | |
|---|---|
| **Study Citation:** | Klier, N. J., West, R. J., Donberg, P. A. (1999). Aerobic biodegradation of dichloroethylenes in surface and subsurface soils. Chemosphere 38(5):1175-1188. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 1740117 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-Dichloroethylene |
| Confidentiality, EndPoint, Type, Guideline | None; other; Experimental; other: Biodegradation in an aquifer microcosm |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | 1,2-14C-trans-1,2-dichloroethylene (55 mCi/mmol) synthesized by Moravek Biochemicals, Inc., Brea, CA purity: >98% by HPLC; Aldrich Chemical Company, Milwaukee, WI; NR; 99+% |
| Oxygen, pH, and CEC | aerobic; Londo soil: 7.7; Oklahoma sand: 8.6; Londo soil: 9.7 meq/100g; Oklahoma sand: 7.6 meq/100g |
| Test Type, Test Temperature, and Test Details | laboratory; 25C; 40 g of soil and 30 mL of water; microcosm using Londo surface soil and synthetic groundwater; microcosm using Oklahoma sand and groundwater; reactions were gently mixed at 1 rpm |
| Soil Type, Clay Silts and Organic Carbon, and Bulk Density | sandy loam; Londo soil: OC=4.2%, 72% sand, 18% silt, 10% clay; Oklahoma sand: OC=0.26%, 94% sand, 4% silt, 2% clay; Not reported |
| Soil Classification, Microbial Biomass, and Humidity | Londo surface soil (sandy loam) and subsurface aquifer material (Oklahoma sand); Londo surface soil: naturally occurring microorganisms not quantified; Oklahoma sand produced ca. 1E5 CFUs per gram dw: Not reported |
| Duration, Parameter, System, and Sampling Frequency | up to 330 days; CO2 evolution; Serum bottles; periodically |
| Control and Blank | Not reported; biologically inhibited controls included for abiotic loss assessment |
| Concentration | 1 - 10 ppm |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | HPLC-UV and LSC; MDL not reported; disappearance of test substance; CO2 recovery |
| Results Remarks | Readily degraded in Londo soil; Oklahoma sand (data not fully presented) demonstrated slower rate of biodegradation, 15-30% after 280 days with 3-10% CO2 recovered. |
| Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results | 50% loss; 30% CO2 at 1 ppm; In Londo soil at 10 ppm trans-DCE exhibited 51% loss and 44% loss in controls at 330 days.; Not reported; 4 weeks for loss; 35 days for CO2; Controls; Viable and control microcosms for trans-DCE exhibited losses of 55 and 20%, respectively (35% net biodegradation loss) after 35 days. |
| 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 name. |
| | Metric 2: | Test Substance Purity | High | The test substance source and purity were not reported. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | High | Controls were not explicitly reported. |

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|---|---|
| **Study Citation:** | Klier, N. J., West, R. J., Donberg, P. A. (1999). Aerobic biodegradation of dichloroethylenes in surface and subsurface soils. Chemosphere 38(5):1175-1188. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 1740117 |

| | | | **EVALUATION** | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 4: | Test Substance Stability | High | Test substance preparation 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 | Test conditions and soil characteristics were reported. |
| | Metric 7: | Testing Consistency | High | Test conditions were consistent across samples and study groups. |
| | Metric 8: | System Type and Design | N/A | This metric is not applicable to the study type. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | High | Inoculum sources and microbial activity were reported. |
| | 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 | Sampling methods addressed the outcomes of interest and used widely accepted approaches. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | Variability between samples was addressed graphically. |
| | 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 | Raw data reported graphically, extraction efficiency and limits of detection not reported. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Low | Statistical methods were not reported. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | High | The results were reasonable. |
| | Metric 18: | QSAR Models | N/A | This metric is not applicable to the study type. |

## Overall Quality Determination — High

| | |
|---|---|
| **Study Citation:** | Lu, X., Li, G., Tao, S., Dijk, J. A., Bosma, T. N. P., Gerritse, J. (2002). Role of electron acceptors and donors in the breakdown of chlorinated hydrocarbons. IAHS Publication, no. 275 (275):175-179. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 4699092 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | not reported; 1,2-Dichloroethene |
| Confidentiality, EndPoint, Type, Guideline | none; other; experimental; other: Anaerobic degradation in soil columns |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR Notes: test material added as a mixture containing vinyl chloride (10 $\mu$M ), trans-1,2-dichloroethene (100 $\mu$M), cis,-DCE (100 $\mu$M), 1,2-DCA (100 $\mu$M), 1,1,1-trichloroethane (10 $\mu$M), trichloroethene (50 $\mu$M) and MCB (10 $\mu$M) |
| Oxygen, pH, and CEC | anaerobic; not reported; not reported |
| Test Type, Test Temperature, and Test Details | laboratory; 20°C; Columns packed with a mixture of sediments from 4 contaminated sites of the Netherlands plus a mineral medium |
| 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 | 200 days; test mat.; glass columns in an anaerobic glove box; not reported |
| Control and Blank | not reported; not reported |
| Concentration | 100 µmol/L |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | not reported; not reported; disappearance of test material |
| Results Remarks | removal of 1,2-DCA from columns was mainly due to microbial degradation based on outlet/inlet ratios of other chlorinated compounds; significant concentrations of ethene and ethane were not detected, suggesting removal via anaerobic oxidative pathways |
| Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results | <20%; not reported; 200 days (6 months); 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 definitively. |
| | Metric 2: | Test Substance Purity | Low | The source and purity of the test substance were not reported. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Low | Control groups were not included. |
| | Metric 4: | Test Substance Stability | Medium | The test substance was prepared and tested as a mixture. |

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|---|---|
| **Study Citation:** | Lu, X., Li, G., Tao, S., Dijk, J. A., Bosma, T. N. P., Gerritse, J. (2002). Role of electron acceptors and donors in the breakdown of chlorinated hydrocarbons. IAHS Publication, no. 275 (275):175-179. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 4699092 |

| | | **EVALUATION** | |
|---|---|---|---|
| Domain | Metric | Rating | Comments |
| Domain 3: Test Conditions | | | |
| Metric 5: | Test Method Suitability | High | The test method was suitable for the test substance. |
| Metric 6: | Testing Conditions | High | Testing conditions were reported. |
| Metric 7: | Testing Consistency | N/A | The metric is not applicable to this study. |
| Metric 8: | System Type and Design | Medium | The system type and design were appropriate. |
| Domain 4: Test Organisms | | | |
| Metric 9: | Outcome Assessment Methodology | High | The inoculum source was reported; previous contamination ambiguous, sterile control not included. |
| 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 of interest. |
| Metric 12: | Test Substance Purity | Low | Details regarding sampling methods of the outcome were not fully reported. |
| Domain 6: Confounding/Variable Control | | | |
| Metric 13: | Confounding Variables | Low | Sources of variability and uncertainty in the measurements were not addressed. |
| 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 | Medium | The study results were reasonable. |
| Metric 18: | QSAR Models | N/A | The metric is not applicable to this study. |

## Overall Quality Determination — Medium

| | |
|---|---|
| **Study Citation:** | Moore, A. T., Vira, A., Fogel, S. (1989). BIODEGRADATION OF TRANS-1 2 DICHLOROETHYLENE BY METHANE-UTILIZING BACTERIA IN AN AQUIFER SIMULATOR. Environmental Science & Technology 23(4):403-406. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 1743885 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | not reported; trans-1,2-dichloroethylene |
| Confidentiality, EndPoint, Type, Guideline | No; inherent biodegradability; experimental; other: Biodegradation in an aquifer simulator |
| Solvent, Reactivity, Storage, Stability | tap water; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; aqueous solution; NR Notes: Authentic standard and analytical standard used for analysis; no additional detail reported |
| Oxygen, pH, and CEC | aerobic; pH7±0.2; not reported |
| Test Type, Test Temperature, and Test Details | laboratory; not reported; Methanotrophic bacteria were added to a saturated soil (sand and pea stone) reactor and stimulated by amending the recirculating water with aqueous solution of mineral nutrients, oxygen, and methane. Aquifer water (simulating contaminated groundwater: 27L tap water, 1 mg/L t-1,2-DCE) was recirculated through the aquifer simulator at a liquid hydraulic retention time = 27L/day. Once the initial t-1,2-DCE degraded the system was spiked 3x with additional t-1,2-DCE. Headspace gas was maintained at 10-20% methane and 10-20% oxygen; during methane starvation only oxygen was added and methane was below 0.3%. |
| Soil Type, Clay Silts and Organic Carbon, and Bulk Density | sand; sand and pea stone; no additional details; not reported |
| Soil Classification, Microbial Biomass, and Humidity | not reported; Mixed culture of methanotrophic bacteria capable of degrading chlorinated solvents was isolated and cultured for the experiment.: not reported |
| Duration, Parameter, System, and Sampling Frequency | up to 190 hours; test mat.; Aquifer simulator with saturated soil (sand and pea stone) reactor; At selected intervals aqueous samples were collected from a three-way sampling valve |
| Control and Blank | not reported; not reported |
| Concentration | ca. 200 µg/L |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | GC/MS; EPA method 601 used for VOC analysis; t-1,2-DCE was compared to an authentic standard and quantified using an internal standard.; test material disappearance |
| Results Remarks | Biodegradation intermediate: dichloroethylene oxide appeared transiently and disappeared: data reported for test with methane addition was concurrent (initial addition at 143 hrs): t-1,2-DCE concentrations initial = 200 µg/L (0 hrs), final â‰¥ 1 Âµg/L(ca. 500 hrs), dichloroethylene oxide concentrations = initial â‰f0.1 Âµg/L (initially observed at ca. 150 hrs), peak = ca. 55 µg/L (ca. 210 hrs), final â‰¥5 Âµg/L (500 hrs). Transformation product: carbon dioxide also reported. Initial loss prior to addition of methane or methanotrophs was attributed to soil adsorption and volatilization and possible diffusion through the plexiglass cover. |
| Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results | Methane previously added: t-1,2-DCE concentrations = 190 Âµg/L (initial, 0 hrs), = ca. 60 Âµg/L (final, ca. 125 hrs). Methane added concurrently (n=2): t-1,2-DCE concentrations = 85 Âµg/L and 170 85 Âµg/L (initial, 0 hrs), â‰¥ 5 Âµg/L and â‰¥ 8 Âµg/L, respectively (final, ca. 85 hrs).; not reported; ca. 85 to 190 hours; no reference reported; test without methane addition; No methane in system: t-1,2-DCE concentrations = 200 µg/L (initial, 0 hrs), = ca. 85 µg/L (final, ca. 140 hrs). |
| Results Details | not reported |
| Mean Total Recovery Results and Results Per Recovery | not reported; aqueous concentrations of t-1,2-DCE monitored for 2 wks to observe the effect of volatilization and soil adsorption |

**EVALUATION**

| Domain | Metric | Rating | Comments |
|---|---|---|---|
| Domain 1: Test Substance | | | |

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|---|---|
| **Study Citation:** | Moore, A. T., Vira, A., Fogel, S. (1989). BIODEGRADATION OF TRANS-1 2 DICHLOROETHYLENE BY METHANE-UTILIZING BACTERIA IN AN AQUIFER SIMULATOR. Environmental Science & Technology 23(4):403-406. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 1743885 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 1: | Test Substance Identity | High | The test substance was identified. |
| | Metric 2: | Test Substance Purity | Medium | The source and purity of the test substance were not reported; however, analysis methods indicated standards were used. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Low | Some concurrent control group details were not included; qualitative data were reported regarding abiotic loss consideration. |
| | Metric 4: | Test Substance Stability | Low | Limited detail regarding this metric. |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | Medium | Non-standard method for outcome of interest. |
| | Metric 6: | Testing Conditions | Medium | There were omissions in testing conditions and aquifer soil characteristics. |
| | Metric 7: | Testing Consistency | Medium | Limited detail regarding this metric; several experiments were conducted with changing variables. |
| | Metric 8: | System Type and Design | Low | Loss resulting from diffusion through system cover was noted as a possibility but not quantified or controlled. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | Medium | Limited detail regarding the test inoculum; bacteria specifically chosen based on its capability to degrade chlorinated hydrocarbons is 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 | Medium | There were minor differences between the assessment methodology and the intended outcome assessment (i.e. biodegradation rate not reported; however, degradation products were reported). |
| | Metric 12: | Test Substance Purity | High | Sampling methods were reported. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Low | Issues with the control variables; the effect of volatilization and soil adsorption was noted but not quantified or further controlled for in additional test. |
| | 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 target chemical concentrations and transformation product concentrations were estimated from a line graph; analytical detail, extraction efficiency, percent recovery, and mass balance were not reported; there was insufficient evidence presented to confirm that parent compound disappearance was not likely due to some other process. |

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|---|---|
| **Study Citation:** | Moore, A. T., Vira, A., Fogel, S. (1989). BIODEGRADATION OF TRANS-1 2 DICHLOROETHYLENE BY METHANE-UTILIZING BACTERIA IN AN AQUIFER SIMULATOR. Environmental Science & Technology 23(4):403-406. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 1743885 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | 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, loss due to abiotic processes not quantified. |
| | Metric 18: | QSAR Models | N/A | The metric is not applicable to this study type. |

## Overall Quality Determination Medium

| | |
|---|---|
| **Study Citation:** | Olaniran, A. O., Pillay, D., Pillay, B. (2006). Biostimulation and bioaugmentation enhances aerobic biodegradation of dichloroethenes. Chemosphere 63(4):600-608. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 3571750 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; trans 1,2-DCE |
| 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; NR |
| Oxygen, pH, and CEC | aerobic; 4.92 (soil); 7.8 (water); Not reported |
| Test Type, Test Temperature, and Test Details | laboratory; 25°C; 100 g of soil collected from contaminated site in South Africa, 75 mL synthetic groundwater, and test substance added to test system, incubated on rotary shaker at 150 rpm for 2 h before initial concentration measurement, incubated without shaking after |
| Soil Type, Clay Silts and Organic Carbon, and Bulk Density | sandy clay; 26.5±1.29% clay; 21.5±2.08% silt; 52.0±0.82% sand; 662 ug/g total organic carbon; Not reported |
| Soil Classification, Microbial Biomass, and Humidity | Not reported; 6.50±1.15 cfu/g x 10^5: Not reported |
| Duration, Parameter, System, and Sampling Frequency | 4 wk; test mat.; Microcosms constructed in laminar flow cabinet in 250 mL serum bottles, crimp-sealed with Teflon-faced butyl rubbers; 0, 1, 2, 4 wk |
| Control and Blank | Not reported; Autoclaved soil and water, and amended with HgCl2 |
| Concentration | 0.5 mM |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | Varian model 3700 gas chromatograph with flame ionization detector; Headspace analyzed, 100 uL samples collected with gas-tight syringe; % test substance degradation |
| Results Remarks | Test substance remaining: 100%/0wk, 85%/1 wk, 63.27%/2 wk, 55%/4wk Values reported graphically and are approximate, except for at 2 wk which was reported in text. |
| Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results | Approx. 45%; Not reported; 4 wk; Autoclaved sterile soil; Not reported |
| Results Details | Biodegradation rate constant: 0.229±0.015/wk |
| Mean Total Recovery Results and Results Per Recovery | Not applicable; Not reported |

**EVALUATION**

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

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|---|---|
| **Study Citation:** | Olaniran, A. O., Pillay, D., Pillay, B. (2006). Biostimulation and bioaugmentation enhances aerobic biodegradation of dichloroethenes. Chemosphere 63(4):600-608. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 3571750 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 4: | Test Substance Stability | Medium | Test substance initial concentration was reported, other preparation details were not included. |
| 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 and soil details were reported. |
| | Metric 7: | Testing Consistency | High | Test conditions were consistent across samples and study groups. |
| | Metric 8: | System Type and Design | N/A | This metric is not applicable to the study type. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | High | Inoculum source reported vaguely (contaminated site in South Africa) but it appropriate for the study. |
| | Metric 10: | Sampling Methods | N/A | This metric is not applicable to the study type. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | High | The outcome assessment methodology addressed the outcomes of interest. |
| | Metric 12: | Test Substance Purity | High | Sampling methods and frequency were appropriate. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | Variability was addressed by statistical techniques, no apparent sources of uncertainty were noted. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | This metric is not applicable to the study type. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Low | The analytical method was appropriate however mass balance, recovery, and limits of detection were not reported. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | Kinetic calculations were described elsewhere, in LaGrega, M.D., Buckingham, P.L., Evans, J.C., 1994. Growthkinetics. In: Clark, B.J., Morris, J.M. (Eds.), HazardousWaste Management. McGraw Hill Inc. Publishers,p. 581. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | High | The results were reasonable. |
| | Metric 18: | QSAR Models | N/A | This metric is not applicable to the study type. |

## Overall Quality Determination High

* Related References: HSDB; HERO ID 6629394

| | |
|---|---|
| **Study Citation:** | Olaniran, A. O., Pillay, D., Pillay, B. (2006). Biostimulation and bioaugmentation enhances aerobic biodegradation of dichloroethenes. Chemosphere 63(4):600-608. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 3571750 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; trans 1,2-DCE |
| 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; NR |
| Oxygen, pH, and CEC | aerobic; 5.02 (soil); 7.8 (water); Not reported |
| Test Type, Test Temperature, and Test Details | laboratory; 25°C; 100 g of soil collected from contaminated site in South Africa, 75 mL synthetic groundwater, and test substance added to test system, incubated on rotary shaker at 150 rpm for 2 h before initial concentration measurement, incubated without shaking after |
| Soil Type, Clay Silts and Organic Carbon, and Bulk Density | sand; 8.25±0.50% clay; 11.5±0.58% silt; 80.25±0.50% sand; 2960 ug/g total organic carbon; Not reported |
| Soil Classification, Microbial Biomass, and Humidity | Not reported; 3.0±0.88 cfu/g x 10^5: Not reported |
| Duration, Parameter, System, and Sampling Frequency | 4 wk; test mat.; Microcosms constructed in laminar flow cabinet in 250 mL serum bottles, crimp-sealed with Teflon-faced butyl rubbers; 0, 1, 2, 4 wk |
| Control and Blank | Not reported; Autoclaved soil and water, and amended with HgCl2 |
| Concentration | 0.5 mM |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | Varian model 3700 gas chromatograph with flame ionization detector; Headspace analyzed, 100 uL samples collected with gas-tight syringe; % test substance degradation |
| Results Remarks | Test substance remaining: 100%/0wk, 78%/1 wk, 65.04%/2 wk, 52%/4wk Values reported graphically and are approximate, except for at 2 wk which was reported in text. |
| Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results | Approx. 48%; Not reported; 4 wk; Autoclaved sterile soil; Not reported |
| Results Details | Biodegradation rate constant: 0.215±0.0104/wk |
| Mean Total Recovery Results and Results Per Recovery | Not applicable; Not reported |

**EVALUATION**

| Domain | | Metric | Rating | Comments |
|---|---|---|---|---|
| Domain 1: Test Substance | | | | |
| | Metric 1: | Test Substance Identity | High | The test substance was identified definitively by name. |
| | Metric 2: | Test Substance Purity | Medium | The test substance source and purity were not reported. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Medium | A sterile control was included, however the results were not reported. |
| | Metric 4: | Test Substance Stability | Medium | Test substance initial concentration was reported, other preparation details were not included. |

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|---|---|
| **Study Citation:** | Olaniran, A. O., Pillay, D., Pillay, B. (2006). Biostimulation and bioaugmentation enhances aerobic biodegradation of dichloroethenes. Chemosphere 63(4):600-608. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 3571750 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | High | The test method was suitable for the test substance. |
| | Metric 6: | Testing Conditions | High | Appropriate test conditions and soil details were reported. |
| | Metric 7: | Testing Consistency | High | Test conditions were consistent across samples and study groups. |
| | Metric 8: | System Type and Design | N/A | This metric is not applicable to the study type. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | High | Inoculum source reported vaguely (contaminated site in South Africa) but it appropriate for the study. |
| | Metric 10: | Sampling Methods | N/A | This metric is not applicable to the study type. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | High | The outcome assessment methodology addressed the outcomes of interest. |
| | Metric 12: | Test Substance Purity | High | Sampling methods and frequency were appropriate. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | Variability was addressed by statistical techniques, no apparent sources of uncertainty were noted. |
| | Metric 14: | Health Outcomes Unrelated to Exposure | N/A | This metric is not applicable to the study type. |
| Domain 7: Data Presentation and Analysis | | | | |
| | Metric 15: | Data Reporting | Low | The analytical method was appropriate however mass balance, recovery, and limits of detection were not reported. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | Kinetic calculations were described elsewhere, in LaGrega, M.D., Buckingham, P.L., Evans, J.C., 1994. Growthkinetics. In: Clark, B.J., Morris, J.M. (Eds.), HazardousWaste Management. McGraw Hill Inc. Publishers,p. 581. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | High | The results were reasonable. |
| | Metric 18: | QSAR Models | N/A | This metric is not applicable to the study type. |

## Overall Quality Determination High

* Related References: HSDB; HERO ID 6629394

| | |
|---|---|
| **Study Citation:** | Scheutz, C., Mosbaek, H., Kjeldsen, P. (2004). Attenuation of methane and volatile organic compounds in landfill soil covers. Journal of Environmental Quality 33(1):61-71. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 2773700 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; rans-1,2-dichloroethylene |
| Confidentiality, EndPoint, Type, Guideline | No; screening test; Experimental; Not Reported |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NA; Aldrich (Steinheim, Germany); NR; 'high purity' |
| Oxygen, pH, and CEC | aerobic; 6.9; NR |
| Test Type, Test Temperature, and Test Details | laboratory; 22°C; Not Reported |
| Soil Type, Clay Silts and Organic Carbon, and Bulk Density | loamy sand; 5.7% silt, 88.1% sand, 5.3% gravel, 3.2% ww organic carbon; 1.55 |
| Soil Classification, Microbial Biomass, and Humidity | loamy sand per USDA classification; from soil 15-20 cm below the surface: 25% w/w |
| Duration, Parameter, System, and Sampling Frequency | 12 hours; test material; soil microcosm; intermittently over study; about 1 time per hour |
| Control and Blank | Not Reported; chemically sterilized soil |
| Concentration | 300 - ug/L |
| Analytical Method, Analytical Details, and Results Per Degredation Parameter | gas chromatograph with a flame ionization detector and an electron capture detector; gas samples (10–500 uL) were taken directly from reaction bottles; Degradation rate integrated over the depth |
| Results Remarks | Oxidation rate = 1.119 ug/g soil/hour; K0, trace (Degradation rate integrated over the depth) = 12,890 mg m-2 d-1 |
| Results Value, Standard Deviation Results, Sample Time Results, Reference Substance Results, and Referencs Substance Compartment Results | Not Reported; NR; 12 times per study (approx); 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 definitively. |
| | Metric 2: | Test Substance Purity | High | The source or purity of the test substance was reported. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | High | A concurrent negative control, or blank group, were included. |
| | Metric 4: | Test Substance Stability | Medium | Some details regarding the test substance storage conditions were not reported; however, the omissions are unlikely impact on the study results. |

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|---|---|
| **Study Citation:** | Scheutz, C., Mosbaek, H., Kjeldsen, P. (2004). Attenuation of methane and volatile organic compounds in landfill soil covers. Journal of Environmental Quality 33(1):61-71. |
| **OECD Harmonized Template:** | Biodegradation in Soil |
| **HERO ID:** | 2773700 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | High | The test method was suitable for the test substance. |
| | Metric 6: | Testing Conditions | High | Testing conditions were monitored, reported, and appropriate for the method. |
| | Metric 7: | Testing Consistency | High | Test conditions were consistent across samples or study groups. |
| | Metric 8: | System Type and Design | Medium | Some details regarding the system type and design were not reported; however, the omissions are unlikely to have a substantial impact on the study results. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | High | The inoculum was described 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 | Medium | Some details regarding the sampling methods were not reported; however, the omissions are unlikely to have a substantial impact on the study results. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | High | Uncertainty in the test substance and degradation product concentrations 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 reported and appropriate. Test substance and degradation product concentrations were reported graphically. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | High | Statistical methods or kinetic calculations were clearly described and address the dataset(s). |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | High | 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:** | IDEM, (1998). Tier I human health noncancer criteria: Trans-1,2-dichloroethylene. |
| **OECD Harmonized Template:** | Aquatic Bioconcentration |
| **HERO ID:** | 9102527 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-dichloroethylene |
| Confidentiality, Type, and Guideline | None; calculation; other: predicted bioaccumulation factor |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | None; NR; NR; NR |
| Test Organism and Test Organism Details | not applicable; not applicable |
| Lipid Content, Test Temperature, pH, and Depuration Time | not applicable; not applicable; not applicable; not applicable |
| Media Type, TOC, and Salinity | not applicable; not applicable; not applicable |
| Dissolved Oxygen, Conductivity, and Hardness | not applicable; not applicable; not applicable |
| Exposure Route, Elimination, and Nominal Measurements | not applicable; not applicable; not applicable |
| Test Type, Test Temperature, and Test Condition Comments | calculation; not applicable; BAF predicted based on Log Kow: Log Kow = 1.514 (CLOGP program), Kow = 32.659 Trophic level 3 FCM = 1.0; trophic level 4 FCM = 1.0; Baseline BAF = (FCM)(Kow) |
| Duration, Parameter, and Sampling Frequency | not applicable; BAF; not applicable |
| Concentration | not applicable |
| Analytical Method and Analytical Details | not applicable; Not Reported; |
| Rate Constant and Results per Recovery | Not Reported; not applicable |
| Statistics, Basis, and Calculation Basis | Not Reported; not applicable; Not Reported |
| Results Value and Results Details | baseline trophic level 3 and 4: 32.66; Used predicted log Kow of 1.514; experimentally available log Kow of 2.09 is about 3.75% higher. |
| Metabolites, Reference, and Results Reference Substance | not applicable; 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 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 | Low | Limited information was reported. |
| Metric 6: | Testing Conditions | Uninformative | Data provided were insufficient to interpret results. |
| Metric 7: | Testing Consistency | N/A | The metric is not applicable to this study type. |

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| | |
|---|---|
| **Study Citation:** | IDEM, (1998). Tier I human health noncancer criteria: Trans-1,2-dichloroethylene. |
| **OECD Harmonized Template:** | Aquatic Bioconcentration |
| **HERO ID:** | 9102527 |

| | | **EVALUATION** | | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 8: | System Type and Design | N/A | The metric is not applicable to this study type. |
| Domain 4: Test Organisms | | | | |
| | Metric 9: | Outcome Assessment Methodology | N/A | The metric is not applicable to this study type. |
| | Metric 10: | Sampling Methods | N/A | The metric is not applicable to this study type. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Low | Deficiencies in reporting were likely to have a substantial impact on results. |
| | 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 | Low | Limited information was provided. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Low | Kinetic calculations were not described clearly and the lack of information was likely to have a substantial impact on study results. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Low | Due to limited information, evaluation of the reasonableness of the study results was not possible. |
| | Metric 18: | QSAR Models | N/A | The metric is not applicable to this study type. |

## Overall Quality Determination — Uninformative

| | |
|---|---|
| **Study Citation:** | IDEM, (1998). Tier I human health noncancer criteria: Trans-1,2-dichloroethylene. |
| **OECD Harmonized Template:** | Terrestrial Bioconcentration |
| **HERO ID:** | 9102527 |

**EXTRACTION**

| Parameter | Data |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-dichloroethylene |
| Confidentiality, EndPoint, Type, Guideline | None; bioaccumulation factor; calculated; other: calculated bioaccumulation factor |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | None; NR; NR; NR |
| Test Organism and Test Organism Details | not applicable; not applicable |
| Lipid Content, Test Temperature, pH, and Depuration Time | not applicable; not applicable; not applicable; not applicable |
| Moisture, TOC, and Test Conditions Comments | not applicable; not applicable; BAF predicted based on Log Kow: Log Kow = 1.514 (CLOGP program), Kow = 32.659 Trophic level 3 FCM = 1.0; trophic level 4 FCM = 1.0; Baseline BAF = (FCM)(Kow) |
| Nominal Measured and Time Plateau | not applicable; not applicable |
| Duration, Parameter, and Sampling Frequency | not applicable; Not Reported; not applicable |
| Analytical Method and Analytical Details | not applicable; not applicable; |
| Results Value, Result Type, and Results Standard Deviation | baseline trophic level 3 and 4: 32.66; BAF; not applicable |
| Calculation Basis and Basis | Not Reported; Not Reported |
| Elimination, Metabolites, Kinetic Parameter, and Statistics | Not Reported; not applicable; 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 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 | Low | Limited information was reported. |
| Metric 6: | Testing Conditions | Uninformative | Data provided were insufficient to interpret results |
| 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 | | | |

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| | |
|---|---|
| **Study Citation:** | IDEM, (1998). Tier I human health noncancer criteria: Trans-1,2-dichloroethylene. |
| **OECD Harmonized Template:** | Terrestrial Bioconcentration |
| **HERO ID:** | 9102527 |

| | | | 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 | Low | Deficiencies in reporting were likely to have a substantial impact on results. |
| | 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 | Low | Limited information was provided. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Low | Kinetic calculations were not described clearly and the lack of information was likely to have a substantial impact on study results. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Low | Due to limited information, evaluation of the reasonableness of the study results was not possible. |
| | Metric 18: | QSAR Models | N/A | The metric is not applicable to this study type. |

## Overall Quality Determination — Uninformative

| | |
|---|---|
| **Study Citation:** | Lam, T. T. (1994). Adsorption and diffusive transport of chlorinated aliphatic solvents in unsaturated soil. |
| **OECD Harmonized Template:** | Adsorption and Desorption |
| **HERO ID:** | 5443592 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 107-06-2; trans-1,2-Dichloroethylene |
| Confidentiality, Type, Guideline | None; Experimental; other: Adsorption of chlorinated hydrocarbons under water saturated conditions via a solid-liquid equilibrium batch method |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NA; Spectrum Chemical (Gardena, CA); Liquid; reagents grade quality or better |
| Sampling Frequency, Sampling Details, and Number of Replicates | 48 hrs; Not reported; 6 for each point + 6 for control |
| pH, Test Temperature, Buffer, and Test Details | 1.5, 2.7, 7 (soil pH 6.6); 21 C; 0.005 M CaCl2; 0.3 - 8 mmol/L test material; liquid:solid ratio for the soil was 2:1. Bottles were shaken and equilibrated for 48 to 55 hours |
| Matrix, Clay Silts and Organic Carbon, and CEC | Not Reported; Sand: 25%, Clay: 25%, Silt: 50%, Organic matter: 3.5%; 12.7 meq/100 g soil |
| Bulk Density and Matrix Details | Not Reported; 3.5% organic matter content |
| Media, Recovery, and Statistics | Quakertown soil; Not Reported; < 5% error |
| Transformation Products, Equilibrium Adsorption Details, and Equilibrium Desorption Details | vinyls; Equilibrium was reached in 20 hours; Not applicable |
| Reference Substance, Reference Substance Results, and Percent Adsorption | The measured steady state diffusioncoefficients (Dg) of TCE at soil water contents of 0.5,1.6, 3.8, 7.4, and 12.6% are 0.027, 0.026,0.024, 0.014, and 0.009 cm3/s, respectively.; Blanks containing aqueous solution and no soil were set up in parallel with soil bottles to account for any solute vapor loss during the equilibration period; Kl (Modified Langmuir monolayer adsorption capacity) = 214.66 |
| Adsorption Coefficient Type, Adsorption Coefficient Results, Adsorption Coefficient Results Comments, and Adsorption Desorption Type | proportionality constant, Kp; Slope = 0.590; Calculated using the Linear Model where solid phase (Cs) is directly proportional to the solution solute concentration (Ce): Cs = Kp x Ce; 0.638 (Freundlich Model) |
| 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 definitively. |
| | Metric 2: | Test Substance Purity | High | The test substance source and purity were reported. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | High | Blank controls to measured volatilization were run concurrently. |
| | Metric 4: | Test Substance Stability | High | Steps were taken to account for non-absorption loss, such as volatilization and biodegradation. |

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| | |
|---|---|
| **Study Citation:** | Lam, T. T. (1994). Adsorption and diffusive transport of chlorinated aliphatic solvents in unsaturated soil. |
| **OECD Harmonized Template:** | Adsorption and Desorption |
| **HERO ID:** | 5443592 |

| | | | **EVALUATION** | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| 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 | 6 samples were used for each test and blanks were run in duplicate. |
| | 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 | Low | Multiple models were used to calculate adsorption, but a Koc was not calculated. |
| | 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 | Medium | Multiple models were used to calculate adsorption, but a Koc was not calculated. |
| 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:** | RIVM, (2007). Ecotoxicologically based environmental risk limits for several volatile aliphatic hydrocarbons. :217. |
| **OECD Harmonized Template:** | Adsorption and Desorption |
| **HERO ID:** | 5159900 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; 1,2-Dichloroethene |
| Confidentiality, Type, Guideline | None; Experimental; other |
| Solvent, Reactivity, Storage, Stability | Not reported; Not reported; Not reported; Not reported |
| Radiolabel, Source, State, Purity | Not reported; Not reported; Not reported; Not reported Notes: Not reported |
| 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 Desorption Type | Not reported; Not Reported; Not Reported; Not reported |
| Partition Coefficient Type and Partition Coefficient Results | Log Koc; 1.77 |
| Partition Coefficient Phase and Partition Coefficient Results | Not reported; Soil/sediment water sorption coefficient (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 by common name. |
| | Metric 2: | Test Substance Purity | Medium | The test substance purity was not reported by the secondary source; however, the omission is unlikely to have a substantial impact on the study results. |
| Domain 2: Test Design | | | | |
| | Metric 3: | Study Controls | Medium | Study controls were not reported in the secondary source; however, the omissions are unlikely to have a substantial impact on the study results. |

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| | |
|---|---|
| **Study Citation:** | RIVM, (2007). Ecotoxicologically based environmental risk limits for several volatile aliphatic hydrocarbons. :217. |
| **OECD Harmonized Template:** | Adsorption and Desorption |
| **HERO ID:** | 5159900 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 4: | Test Substance Stability | Medium | Details regarding the test substance preparation, homogeneity, and storage conditions were not reported by the secondary source; however, the omissions are unlikely to have a substantial impact on the study results. |
| Domain 3: Test Conditions | | | | |
| | Metric 5: | Test Method Suitability | Low | Details regarding the test method were not reported in the secondary report. |
| | Metric 6: | Testing Conditions | Medium | Some details regarding the testing conditions were not reported in the secondary report; however, the omissions are unlikely to have a substantial impact on the study results. |
| | Metric 7: | Testing Consistency | Medium | Some details regarding the testing conditions across study groups were not reported in the secondary report; however, the omissions are unlikely to have a substantial impact on the study results. |
| | Metric 8: | System Type and Design | Low | The system type was not clearly reported in the secondary report and the omissions may have an 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 | N/A | The metric is not applicable to the study type. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | Low | The outcome assessment was not reported in the secondary report which may have an impact on the study results. |
| | Metric 12: | Test Substance Purity | Medium | The sampling methods were not described in the secondary report; however, the omissions are unlikely to have a substantial impact on the study results. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Medium | Sources of variability and uncertainty in the measurements were not reported in the secondary report. |
| | 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 | Details regarding the sampling type were not reported in the secondary report. |
| | Metric 16: | Statistical Methods and Kinetic Calculations | Medium | Statistical methods were not reported in the secondary reported. |
| Domain 8: Other | | | | |
| | Metric 17: | Verification or Plausibility of Results | Medium | A reference substance was not reported; however, the study results are reasonable. |
| | Metric 18: | QSAR Models | N/A | The metric is not applicable to the study type. |

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|---|---|
| **Study Citation:** | RIVM, (2007). Ecotoxicologically based environmental risk limits for several volatile aliphatic hydrocarbons. :217. |
| **OECD Harmonized Template:** | Adsorption and Desorption |
| **HERO ID:** | 5159900 |

**EVALUATION**

| Domain | Metric | Rating | Comments |
|---|---|---|---|
| **Overall Quality Determination** | | **Medium** | |

* Related References: Tao, S., Piao, H., Dawson, R., Lu, X. and Hu, H. 1999. Estimation of organic carbon normalized sorption coefficient (Koc) for soils using the fragment constant method. Environ. Sci. Technol. 33, 2719-2725.

| | |
|---|---|
| **Study Citation:** | Patten, K. O., Wuebbles, D. J. (2010). Atmospheric lifetimes and Ozone Depletion Potentials of trans-1-chloro-3,3,3-trifluoropropylene and trans-1,2-dichloroethylene in a three-dimensional model. Atmospheric Chemistry and Physics 10(22):10867-10874. |
| **OECD Harmonized Template:** | Miscellaneous |
| **HERO ID:** | 5433892 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | 156-60-5; trans-1,2-Dichloroethene |
| Confidentiality, Type, Guideline | None; calculation; calculation |
| Solvent, Reactivity, Storage, Stability | NR; NR; Stored in dark bottles over molecular sieves.; NR |
| Radiolabel, Source, State, Purity | No; Aldrich; Liquid; 98 mol% |
| Test Method Details, Test Condition Details, and Test Consistency Details | MOZART (Model for Ozone and Related Tracers) version 3 estimation.; MOZART is a three-dimensional, global atmospheric chemical transport model. The model has been compared to aircraft and satellite based observations.; Not Reported |
| System Type Design | Not Reported |
| Sampling Frequency and Sampling Details | Not Reported; Not Reported |
| Test Temperature | Not Reported |
| Results Details | Atmospheric lifetime: 12.7 days. Hydroxyl reaction rate: 1.01*10^-12 exp((250 K)/T) cm3/molecule seconds where T is temp in Kelvin |
| 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 using common nomenclature. |
| | 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. |
| | 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 | N/A | The metric is not applicable to the study type. |
| | Metric 6: | Testing Conditions | N/A | The metric is not applicable to the study type. |
| | Metric 7: | Testing Consistency | N/A | The metric is not applicable to the study type. |
| | 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. |

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|---|---|
| **Study Citation:** | Patten, K. O., Wuebbles, D. J. (2010). Atmospheric lifetimes and Ozone Depletion Potentials of trans-1-chloro-3,3,3-trifluoropropylene and trans-1,2-dichloroethylene in a three-dimensional model. Atmospheric Chemistry and Physics 10(22):10867-10874. |
| **OECD Harmonized Template:** | Miscellaneous |
| **HERO ID:** | 5433892 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | Metric 10: | Sampling Methods | N/A | The metric is not applicable to the study type. |
| Domain 5: Outcome Assessment | | | | |
| | Metric 11: | Test Substance Identity | N/A | The metric is not applicable to the study type. |
| | 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 | N/A | The metric is not applicable to the study type. |
| | 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 | Low | The accuracy of the modeled data could not be verified. |
| | Metric 18: | QSAR Models | N/A | The metric is not applicable to the study type. |

## Overall Quality Determination Medium

| | |
|---|---|
| **Study Citation:** | Semprini, L., Hopkins, G. D., Roberts, P. V., Grbic-Galic, D., Mccarty, P. L. (1991). A Field Evaluation of In-Situ Biodegradation of Chlorinated Ethenes: Part 3, Studies of Competitive Inhibition. Groundwater 29(2):239-250. |
| **OECD Harmonized Template:** | Miscellaneous |
| **HERO ID:** | 1741914 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | not reported; 1,2-Dichloroethene |
| Confidentiality, Type, Guideline | None; transport; transport |
| Solvent, Reactivity, Storage, Stability | injection fluid; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR Notes: Added as dissolved component of the injection fluid. |
| Test Method Details, Test Condition Details, and Test Consistency Details | Two tracer experiments were performed to evaluate transport within a shallow aquifer; one experiment was run using cis-DEC, TCE, and trans-DCE, continuous inject for 900 hours, bromide injection was for 270 hours; the second experiment also included vinyl chloride.; Experiments performed in a shallow confined aquifer.; Not Reported |
| System Type Design | Aquifer consisted of sands and gravel; bounded above and below with clay and silt layers. |
| Sampling Frequency and Sampling Details | Data acquisition was performed every 45 minutes.; ca. 6 samples per day were obtained at each of 5 monitoring locations |
| Test Temperature | ambient |
| Results Details | Delayed breakthrough resulted from sorption onto aquifer solids; estimated retardation factor = 12 (based on 50% breakthrough time of normalized concentrations of chlorinated compounds compared to the bromide tracer). Spreading was greater compared to the bromide tracer. At the end of the second experiment fractional breakthrough of the chlorinated compounds reached 90-95%. |
| Analytical Method and Analytical Details | Not specified; Not specified |
| Transformation Products, Statistics, and Kinetics | Minimal transformation was observed.; Not specified; Not specified |
| Reference Substance and Reference Substance Results | Bromide tracer; 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. |
| 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 | Medium | Details of field experiments were cited to earlier papers. |
| | Metric 6: | Testing Conditions | Medium | Details of field characteristics were cited to earlier papers. |
| | Metric 7: | Testing Consistency | High | Test conditions were consistent. |
| | Metric 8: | System Type and Design | N/A | Field experiments. |

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|---|---|
| **Study Citation:** | Semprini, L., Hopkins, G. D., Roberts, P. V., Grbic-Galic, D., Mccarty, P. L. (1991). A Field Evaluation of In-Situ Biodegradation of Chlorinated Ethenes: Part 3, Studies of Competitive Inhibition. Groundwater 29(2):239-250. |
| **OECD Harmonized Template:** | Miscellaneous |
| **HERO ID:** | 1741914 |

| | | | **EVALUATION** | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| 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 | Medium | There was incomplete reporting of outcome assessment methods; however, retardation factor was 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 the study. |
| | 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 | 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 | Medium | The study results were reasonable. |
| | Metric 18: | QSAR Models | N/A | The metric is not applicable to the 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 | 156-60-5; 1,2-Dichloroethene |
| Confidentiality, Type, Guideline | None; Experimental; Experimental |
| Solvent, Reactivity, Storage, Stability | NR; NR; NR; NR |
| Radiolabel, Source, State, Purity | NR; NR; NR; NR Notes: 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 DCE in influent ca. 2.5 µg/L and effluent ca. 0.4 µg/L and based on modeling the predicted effluent was ca. 0.2 µg/L. Relative magnitude of emissions predicted from aerator > 1,000 µg/s, clarifier > 1,000 µg/s, and weir > 1,000 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 | High | The test substance was identified by name. |
| 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:** | ENSR, (1990). Subsurface investigation chlorinated solvents in groundwater: AT&T Information Systems Skokie Works with attachments, cover sheet and letter dated 020690. |
| **OECD Harmonized Template:** | Other Properties |
| **HERO ID:** | 1745629 |

**EXTRACTION**

| **Parameter** | **Data** |
|---|---|
| CASRN and Test Material | NR; trans-1,2-dichloroethylene |
| Confidentiality, Type, Guideline | None; experimental; None, monitoring study |
| Solvent, Reactivity, Storage, Stability | NA; NA; NA; NA |
| Radiolabel, Source, State, Purity | NA; Contaminated subsurface soil; NR; NA Notes: 1,1-dichloroethane, trans-1,2-DCE and vinyl chloride detected in groundwater downgradient from tanks however, the plant did not use these solvents (a tank with 1,1,1-trichloroethane and trichloroethene was nearby) 1,1,2-TCE not detected in any samples |
| Results Value | Subsurface transport and likely degradation |
| Results Details | Aerobic and anaerobic biodegradation studies using the soils suggest the chlorinated solvents are recalcitrant without nutrients. |
| Results Remarks | 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 of the test material was reported. |
| Domain 2: Test Design | | | |
| Metric 3: | Study Controls | N/A | The study did not require concurrent control groups. |
| Metric 4: | Test Substance Stability | 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. |
| Metric 6: | Testing Conditions | Low | The study used monitoring data and unknown deviations in test conditions may have a substantial impact on the results. |
| Metric 7: | Testing Consistency | Low | There were possible inconsistencies in test conditions across samples or study groups that are likely to have a substantial impact on 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 | High | Inoculum sources (contaminated soil) were reported. |
| Metric 10: | Sampling Methods | N/A | The metric is not applicable to this study type. |
| Domain 5: Outcome Assessment | | | |

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|---|---|
| **Study Citation:** | ENSR, (1990). Subsurface investigation chlorinated solvents in groundwater: AT&T Information Systems Skokie Works with attachments, cover sheet and letter dated 020690. |
| **OECD Harmonized Template:** | Other Properties |
| **HERO ID:** | 1745629 |

| | | | EVALUATION | |
|---|---|---|---|---|
| Domain | | Metric | Rating | Comments |
| | 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 | No notable uncertainties or limitations in sampling methods were expected to influence results. |
| Domain 6: Confounding/Variable Control | | | | |
| | Metric 13: | Confounding Variables | Low | There is concern that variability or uncertainty was likely to have a substantial impact on the 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 | Uninformative | Quantitative concentrations of the target chemical, 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 | No statistical analyses were conducted; however, sufficient data were provided to conduct an independent statistical analysis. |
| 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

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

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

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| Term | Definition |
|---|---|
| nm | Nanometers |
| NR | Not Reported |
| OECD | Organisation for Economic Co-operation and Development |
| · OH | Hydroxyl radical |
| OPE | Organophosphate Ester |
| pg/L | Picograms per Liter |
| ppm | parts per million |
| QSAR | Quantatative Structure Activity Relationship |
| RSD | Relative Standard Deviation |
| SI | Supplemental Information |
| SIM | Selected Ion Monitoring |
| SPE | Solid Phase Extraction |
| STP | Sewage Treatment Plant |
| TMF | Trophic Magnification Factor |
| TOC | Total Organic Carbon |
| TOF | Time of Flight |
| $\mu$g/L or $\mu$g/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 |