

3	CAS No.: 156-59-2	Substance: cis-1,2-Dichloroethylene
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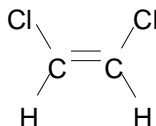
Chemical Substances Control Law Reference No.: 2-103 (as dichloroethylene)

PRTR Law Cabinet Order No.: 1-118

Structural Formula:

Molecular Formula: C₂H₂Cl₂

Molecular Weight: 96.94



1. General information

The aqueous solubility of this substance is 3.50×10^3 mg/1000g (25°C) and the partition coefficient (1-octanol / water) (log Kow) is 1.83. The vapor pressure is 201 mmHg ($= 2.68 \times 10^4$ Pa) (25°C, extrapolated value). Degradability (aerobic degradation) in terms of BOD-based degradation percentage is estimated to be 0%. This substance does not have hydrolyzable groups. This substance is determined to be no or little bioaccumulative.

This substance is controlled under the Environmental Standards (quality of water, soil, groundwater) and under the under the target value for water quality standards in tap water. It is also a Type 2 Monitoring Chemical Substance under the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances and a Class 1 Designated Chemical Substance under the Law concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (PRTR Law). It is used primarily as a raw material of synthetic chloride-line solvent, a solvent of low-temperature extraction (*cis*- and *trans*-forms) of dyes, perfume, resin, etc. Production of this substance in FY1998 was 44 tons.

2. Exposure assessment

Total release to the environment in FY2004 under the PRTR Law came to approximately 5.0 tons, all of which was reported. Release to the public water bodies accounted for a large part of the reported release. The industries which reported release of large quantities of this substance were Chemical Industry for the atmosphere, and the sewerage works for the public water bodies. However, the release quantity from the sewerage works may be over estimated.

The distribution into each environmental medium predicted by means of a multimedia model was 54.6% for the atmosphere and 45.0% for water bodies in the case of the region where the release quantity to the environment and the public water bodies was considered to be the maximum. In the case of the region where the release quantity to the atmosphere was considered to be the maximum, the distributions were 65.8% for the atmosphere, and 34.1% for water bodies.

The predicted environmental concentration (PEC) that indicates exposure to aquatic organisms was estimated to be 8 µg/L for freshwater and less than 4 µg/L for seawater public water bodies.

3. Initial assessment of ecological risk

With regard to acute toxicity, reliable information of a 72-hour EC₅₀ growth inhibition value exceeding 73,600 µg/L was found for the algae *Pseudokirchneriella subcapitata*, a 48-hour EC₅₀ immobilization value of 40,200 µg/L was found for the crustacea *Daphnia magna* (water flea), and a 96-hour LC₅₀ value of 67,200 µg/L was found for the fish *Oryzias latipes* (medaka). Accordingly, an assessment factor of 100 was used, a predicted no effect concentration (PNEC) of 402 µg/L was obtained based on the acute toxicity values. With regard to chronic toxicity, reliable information of a 72-hour no observed effect concentration (NOEC) growth inhibition value of 73,600 µg/L was found for the algae *P. subcapitata*, and a 21-day NOEC reproduction value of 4,510 µg/L was found for the crustacea *D. magna*. So an assessment factor of 100 was used, and a PNEC value of 45 µg/L was obtained based on the chronic toxicity values. As the PNEC for the substance, a value of 45 µg/L obtained from the chronic toxicity for the crustacea was used.

The PEC/PNEC ratio was 0.2 for freshwater bodies, and less than 0.09 for seawater bodies. Accordingly, there is thought to need the effort of collection of information about this substance. This substance is controlled under the Environmental Standards. Accordingly, there is thought to be need for the monitoring of the environmental concentration, considering the area detected a high concentration and PRTR release quantity, etc.

Hazard assessment (basis for PNEC)			Assessment factor	Predicted no effect concentration PNEC (µg/L)	Exposure assessment		PEC/PNEC ratio	Result of assessment
Species	Acute / chronic	Endpoint			Water body	Predicted environmental concentration PEC (µg/L)		
Crustacea (water flea)	Chronic	NOEC reproduction	100	45	Freshwater	8	0.2	▲
					Seawater	< 4	< 0.09	

4. Conclusions

	Conclusions	Judgment
Ecological risk	Requiring information collection. There is thought to be need for the monitoring of the environmental concentration, considering the area detected a high concentration and PRTR release quantity.	▲

[Risk judgments] ○: No need of further work ▲: Requiring information collection
 ■: Candidates for further work ×: Impossible of risk characterization