

4	CAS No.: 1321-74-0 [91-14-5 (<i>o</i> -Divinylbenzene), 108-57-6 (<i>m</i> - Divinylbenzene), 105-06-6 (<i>p</i> -Divinylbenzene)]	Substance: Divinylbenzene
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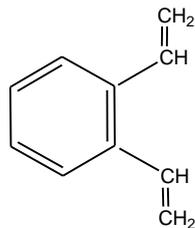
Chemical Substances Control Law Reference No.: 3-14

PRTR Law Cabinet Order No.: 2-37 (Cabinet Order No. after revision*: 1-202)

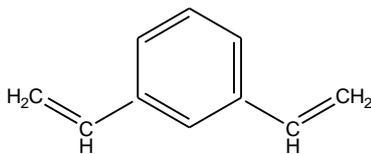
Molecular Formula: C₁₀H₁₀

Molecular Weight: 130.18

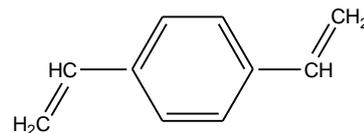
Structural Formula:



o-Divinylbenzene



m-Divinylbenzene



p-Divinylbenzene

*Note: No. according to revised order enacted on October 1, 2009.

1. General information

The aqueous solubility of this substance is 53 mg/L (*o*-, *m*-, *p*-isomers; 25°C; calculated value), the partition coefficient (1-octanol/water) (log K_{ow}) is 3.8 (*o*-isomer, *m*-isomer, *p*-isomer; calculated value), and the vapor pressure is 0.66 mmHg (=88 Pa) (*o*-isomer; 25°C; calculated value), 0.579 mmHg (=77.2 Pa) (*m*-isomer; 25°C), and 0.53 mmHg (=71 Pa) (*p*-isomer; 25°C; calculated value). The biodegradability (aerobic degradation) is characterized by a BOD degradation rate of 0%, and bioaccumulation is thought to be nonexistent or low (officially published name is *m*- (or *p*-) divinylbenzene). The substance does not have any hydrolyzable groups in the environment.

This substance was classified as a Class 2 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). However, it was removed from the Class 2 Designated Chemical Substance list as a result of the revision of substances regulated by the PRTR Law (enacted on October 1, 2009) and was newly designated as a Class 1 Designated Chemical Substance. In addition, it is designated as a Type III Monitoring Chemical Substance under the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances. It is primarily used as a cross-linking agent in ion exchange resins, synthetic rubbers, ion exchange membranes, and styrenic resins such as ABS resin, MBS resin, and unsaturated polyester resin. The production and import quantity in fiscal 2007 was 1,340 t.

2. Exposure assessment

Because this substance was not a Class 1 Designated Chemical Substance prior to revision of substances regulated by the PRTR Law, release and transfer quantities could not be obtained. Predictions of distribution by medium using a Mackay-type level III fugacity model indicated that if equal quantities were released to the atmosphere, water bodies, and soil, then for all isomers (*o*-isomer, *m*- isomer, and *p*- isomer), the proportion distributed to soil would be greater.

The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, was reported to be generally less than 0.002 µg/L for public freshwater bodies, and less than 0.002 µg/L for seawater.

3. Initial assessment of ecological risk

With regard to acute toxicity, the following reliable data were obtained: a 72-h median effective concentration (EC₅₀)

of 1,830 µg/L for growth inhibition in the green algae *Pseudokirchneriella subcapitata*; a 48-h EC₅₀ of 870 µg/L for swimming inhibition in the crustacean *Daphnia magna*; and a 96-h median lethal concentration (LC₅₀) of 4,160 µg/L for the fish species *Oryzias latipes* (medaka). Accordingly, based on these acute toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) of 18 µg/L was obtained. With regard to chronic toxicity, the following reliable data were obtained: a 72-h no observed effect concentration (NOEC) of 906 µg/L for growth inhibition in the green algae *P. subcapitata*, and a 21-d NOEC of 353 µg/L for reproductive inhibition in the crustacean *D. magna*. Accordingly, based on these chronic toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) of 3.5 µg/L was obtained. The value of 3.5 µg/L obtained from the chronic toxicity to the crustacean was used as the PNEC for this substance.

The PEC/PNEC ratio was less than 0.0006 for both freshwater bodies and seawater. Accordingly, further work is thought to be unnecessary at this time.

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)		
Crustacean (water flea)	Chronic	NOEC Reproductive inhibition	100	3.5	Freshwater	<0.002	<0.0006	○
					Seawater	<0.002		

4. Conclusions

	Conclusions	Judgment
Ecological risk	No need for further work.	○

- [Risk judgments] ○: No need for further work ▲: Requiring information collection
 ■: Candidates for further work ×: Impossibility of risk characterization
 (○) : Though a risk characterization cannot be determined, there would be little necessity of collecting information.
 (▲) : Further information collection would be required for risk characterization.