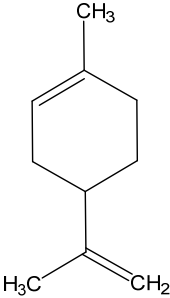


1	CAS No.: 5989-27-5	Substance: ( <i>R</i> )-4-Isopropenyl-1-methylcyclohexa-1-ene
<p>Chemical Substances Control Law Reference No.: 3-2245 (Limonene), 7-988 (Dipentene), 8-498 (<i>dl</i>-Limonene)  PRTR Law Cabinet Order No.:</p> <p>Molecular Formula: C<sub>10</sub>H<sub>16</sub>  Molecular Weight: 136.23</p> <p>Structural Formula:</p> 		
<p><b>1.General information</b></p> <p>The aqueous solubility of this substance is 20 mg/1,000 g (25°C), the partition coefficient (1-octanol/water) (log K<sub>ow</sub>) is 4.38, and the vapor pressure is 2.08 mmHg (=277 Pa) (25°C). The biodegradability (aerobic degradation) is characterized by a BOD degradation rate of 73% and biodegradability is judged to be good. In addition, this substance does not possess any hydrolyzable groups and hydrolysis does not occur under ambient environmental conditions.</p> <p>The main use of this substance is as a food additive (flavoring agent). It is also used as an herbicide (on trees etc. and on management of housing estates, parks, parking lots, sports grounds, etc.) in the form of 10% and 70% emulsions. The production and import quantity of in fiscal 2015 was 582 t. In agricultural chemical year 2018 (October to September), 1.18 kL of agricultural chemical was shipped.</p> <p>-----</p> <p><b>2.Exposure assessment</b></p> <p>Because this substance is not classified as a Class 1 Designated Chemical Substance under the PRTR Law, release and transfer quantities could not be obtained. Predictions of proportions distributed to individual media by use of a Mackay-type level III fugacity model indicate that if equal quantities were released to the atmosphere, water bodies, and soil, the proportion distributed to soil would be largest.</p> <p>The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, was reported to be around 0.16 µg/L for public freshwater bodies and around 0.0054 µg/L for seawater.</p> <p>-----</p> <p><b>3.Initial assessment of ecological risk</b></p> <p>With regard to acute toxicity, the following reliable data were obtained: a 72-h EC<sub>50</sub> of 150 µg/L for growth inhibition in the alga <i>Raphidocelis subcapitata</i>, a 48-h EC<sub>50</sub> of 307 µg/L for swimming inhibition in the crustacean <i>Daphnia magna</i>, and a 96-h LC<sub>50</sub> of 702 µg/L for the fish species <i>Pimephales promelas</i> (fathead minnow). Accordingly, based on these acute toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) of 1.5 µg/L was obtained.</p> <p>With regard to chronic toxicity, the following reliable data were obtained: a 72-h NOEC of 50 µg/L for growth inhibition in the alga <i>R. subcapitata</i> and a 21-d NOEC of 80 µg/L for reproductive inhibition in the crustacean <i>D. magna</i>. Accordingly, based on this chronic toxicity value and an assessment factor of 100, a PNEC of 0.5 µg/L was obtained.</p> <p>The value of 0.5 µg/L obtained from the chronic toxicity to the crustacean was used as the PNEC for this substance.</p> <p>The PEC/PNEC ratio is 0.32 for freshwater bodies and 0.01 for seawater; accordingly, <u>efforts to collect data are needed for determining ecological risk. A comprehensive review of the above findings draws the same conclusion.</u></p> <p><u>Environmental concentration data need to be augmented taking into consideration major emission sources. Further, efforts to collect data regarding chronic toxicity to fish species are needed.</u></p>		

Hazard assessment (basis for PNEC)			Assessment coefficient	Predicted no effect concentration PNEC (µg/L)	Exposure assessment		PEC/PNEC ratio	Comprehensive judgment
Species	Acute/ chronic	Endpoint			Water body	Predicted environmental concentration PEC (µg/L)		
Green algae	Chronic	NOEC Growth inhibition	100	0.5	Freshwater	0.16	0.32	▲
					Seawater	0.0054	0.01	

#### 4. Conclusions

	Conclusions	Judgment
Ecological risk	Requiring information collection.	▲

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