9	CAS No.: 107-19-7	Substance: 2-Propyn-1-ol
Chemical	Substances Control Law Refe	erence No.: 2-272
PRTR La	w Cabinet Order No.:	Structural formula:
Molecula	r Formula: C ₃ H ₄ O	HC
Molecula	r Weight: 56.06	NC OH
		H_2

1.General information

The aqueous solubility of this substance is 1.00×10^6 mg/L (20°C), the partition coefficient (1-octanol/water) (log K_{ow}) is -0.38 (pH unknown), and the vapor pressure is 2.08×10^3 Pa (25). The biodegradability (aerobic degradation) is characterized by a BOD degradation rate of 95% and biodegradability is judged to be good. Further, degradability screening tests indicated a residual ratio of 99% after 5 days (initial concentration: 5 µg/mL, pH: 7) for hydrolyzability.

The main uses of this substance are as a plating brightener, dissolution inhibitor in mineral acids, corrosion inhibitor, and a raw material for antimicrobials. Further, the production and import quantities in fiscal 2021 were not disclosed because the number of reporting businesses was less than two. However, less than 1,000 t was reported in fiscal 2020.

2.Exposure assessment

This substance was classified as a Class 1 Designated Chemical Substance prior to revision of substances regulated by the PRTR Law. Total release to the environment in fiscal 2021 under the PRTR Law was 0.036 t, of which 0.31 t or 86% of overall releases were notified. All notified releases were to the atmosphere. In addition, 0.005 t was transferred to sewage and 0.015 t was transferred to waste materials. Industry types with large notified releases were the agricultural chemical industry and the chemical industry. The largest release among releases to the environment including those unnotified was to the atmosphere. A multi-media model used to predict the proportions distributed to individual media in the environment indicated that in regions where the largest quantities were estimated to have been released to the environment overall or to the atmosphere in particular, the predicted proportion distributed to water bodies would be 38.8%, and the predicted proportion distributed to public water bodies, the predicted proportion distributed to public water bodies, the predicted proportion distributed to public water bodies, the predicted proportion distributed to water bodies, the predicted proportion distributed to public water bodies, the predicted proportion distributed to water bodies, the predicted proportion distributed to water bodies, the predicted proportion distributed to public water bodies, the predicted proportion distributed to public water bodies, the predicted proportion distributed to water bodies.

The maximum expected concentration of exposure to humans via inhalation could not be defined because ambient atmospheric and indoor air quality data could not be obtained. Further, the mean annual value for atmospheric concentration in fiscal 2021 was calculated by use of a plume-puff model on the basis of releases to the atmosphere reported under the PRTR Law: this model predicts a maximum level of $0.0059 \ \mu g/m^3$.

Data for potable water, ground water, public freshwater bodies, food, and soil to assess oral exposure could not be obtained. Further, while no emissions to public freshwater bodies were notified in fiscal 2021 under the PRTR Law, transfer to sewage was reported. Accordingly, when releases to public freshwater bodies estimated from the reported transfer to sewage were divided by the ordinary water discharge of the national river channel structure database, estimating the concentration in rivers by taking into consideration only dilution gave a maximum value of 0.060 μ g/L, and the oral exposure calculated thereof was 0.0024 μ g/kg/day. The exposure to this substance by intake from an environmental medium via food is considered slight, given the low bioaccumulation of the substance expected on the basis of its physicochemical properties.

Exposure to aquatic organisms based on water quality data could not be estimated. While no releases to public freshwater bodies were notified under the PRTR law in fiscal 2021, when releases to public freshwater bodies estimated from the reported transfer to sewage were divided by the ordinary water discharge of the national river channel structure database, estimating the concentration in rivers by taking into consideration only dilution gave a maximum value of 0.060 μ g/L.

3. Initial assessment of health risk

This substance irritates the eyes, the skin, and the respiratory tract. Inhalation of this substance will cause a cough and sore throat.

Contact with the skin will cause redness. Contact with the eyes will cause pain and severe deep burns.

Since not enough information was available on the carcinogenicity of the substance, the initial assessment was conducted based on information on its non-carcinogenic effects.

The LOAEL of 5 mg/kg/day for oral exposure (based on the increased relative weights of the liver and the kidney), determined from toxicity tests in rats, was divided by a factor of 10 to account for uncertainty in using a LOAEL and by another factor of 10 to account for extrapolation to chronic exposure. The calculated value of 0.05 mg/kg/day was deemed the lowest reliable dose and was identified as the 'non-toxic level' of the substance for oral exposure. The LOAEL of 4 ppm for inhalation exposure (based on respiratory epithelial hyperplasia of the nose), determined from toxicity tests in rats, was adjusted according to exposure conditions to obtain 0.71 ppm and subsequently divided by a factor of 10 to account for uncertainty in using a LOAEL and by another factor of 10 to account for extrapolation to chronic exposure. The calculated value of 0.0071 ppm (0.016 mg/m³) was deemed the lowest reliable concentration and was identified as the 'non-toxic level' of the substance for inhalation exposure.

Regarding oral exposure, due to the lack of identified exposure levels, the health risk could not be assessed. The maximum exposure level was estimated to be 0.0024 µg/kg/day according to the concentration in effluents based on the transfers to the sewage system reported in FY 2021 under the PRTR Law. The MOE for reference would be 2,100 which is calculated from the estimated maximum exposure level and the 'non-toxic level' of 0.05 mg/kg/day and subsequently divided by a factor of 10 to account for extrapolation from animals to humans. Since exposure to the substance in environmental media via food is presumed to be limited, despite the lack of exposure level via food, including it in the calculation would not change the MOE significantly. Therefore, as a comprehensive judgment, no further work would be required at present.

Regarding inhalation exposure, due to the lack of identified exposure concentrations, the health risk could not be assessed. The maximum concentration (annual mean) in ambient air was estimated to be 0.0059 μ g/m³, based on the releases to air reported in FY 2021 under the PRTR Law. The MOE for reference would be 270 which is calculated from the estimated maximum concentration (annual mean) in ambient air and the 'non-toxic level' of 0.016 mg/m³ and subsequently divided by a factor of 10 to account for extrapolation from animals to humans. Therefore, as a comprehensive judgment, the collection of further information would not be required to assess the health risk of this substance via inhalation exposure.

Toxicity				Exposi					
Exposure Path	Criteria for risk assessment		Animal	Criteria for diagnoses (endpoint)	Exposure medium	Predicted maximum exposure dose and concentration	Rest	ult of risk essment	Comprehensive judgment
	'Non-	0.05 // /1	D.	The increased relative	Drinking water	- μg/kg/day	MOE	-	0
Oral	level*'	0.05 mg/kg/day	Kats	the kidney	Groundwater	- μg/kg/day	MOE	-	U
Inhalation	'Non- toxic	0.016 mg/m^3	Rats	Respiratory epithelial	Ambient air	- μg/m ³	MOE	-	- O - O - X
minution	level*'	otorio ingini	raub	hyperplasia of the nose	Indoor air	- μg/m ³	MOE	-	×

Non-toxic level *

• When a LOAEL is available, it is divided by 10 to obtain a NOAEL-equivalent level.

• When an adverse effect level for the short-term exposure is available, it is divided by 10 to obtain a level equivalent to an adverse effect level for the long-term exposure.

4. Initial assessment of ecological risk

With regard to acute toxicity, the following reliable data were obtained: a 72-h EC_{50} exceeding 98,100 µg/L for growth inhibition in the green alga *Desmodesmus subspicatus*, a 48-h EC_{50} of 3,360 µg/L for swimming inhibition in the crustacean

Daphnia magna, a 96-h LC₅₀ of 1,440 μ g/L for the fish *Pimephales promelas* (fathead minnow), and a 96-h LC₅₀ of 3,000 μ g/L for the African clawed frog *Xenopus laevis*. Accordingly, based on the minimum acute toxicity value and an assessment factor of 100, a predicted no effect concentration (PNEC) of 14 μ g/L was obtained.

With regard to chronic toxicity, the following reliable datum was obtained: a 72-h NOEC of 10,900 μ g/L for growth inhibition in the green alga *D. subspicatus*. Accordingly, based on this chronic toxicity value and an assessment factor of 100, a predicted no effect concentration (PNEC) of 100 μ g/L was obtained.

The value of 14 g/L obtained from the acute toxicity for fish was used as the PNEC for this substance.

Data for setting the predicted environmental concentration (PEC) could not be obtained for this substance. Accordingly, an assessment of ecological risk could not be made.

While no emissions to public freshwater bodies were notified in fiscal 2021 under the PRTR Law, transfer to sewage was reported. Accordingly, when releases to public freshwater bodies estimated from the reported transfer to sewage were divided by the ordinary water discharge of the national river channel structure database, estimating the concentration in rivers by taking into consideration only dilution gave a maximum value of $0.060 \mu g/L$. The ratio of this value to PNEC was 0.004. Accordingly, based on a comprehensive review of the above findings, further work is considered unnecessary at this time.

Hazard assessment (basis for PNEC)				Predicted no effect	Expo	sure assessment	DEC/	
Species	Acute/ chronic	Endpoint	Assessment	concentration PNEC (µg/L)	Water body	Predicted environmental concentration PEC (µg/L)	PEC/ PNEC ratio	judgment
Fish Pimenhales	Acute	LC ₅₀	100	14	Freshwater	—	Ι	0
promelas	ricute	Mortality	100		Seawater	_	_	

5. Conclusions

		Conclusions	Judgment	
TT 1/1 * 1	Oral exposure	No need for further work.	0	
Health fisk	Inhalation exposure	No need for further work.	0	
Ecological risk	No need for further work.			

[Risk judgments] \bigcirc : No need for further work

▲: Requiring information collection

■: Candidates for further work

×: Impossibility of risk characterization