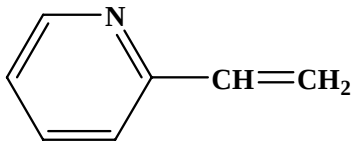
1 2	CAS No.: 100-69-6	Substance: 2-vinylpyridine

Chemical Substances Control Law Reference No.: 5-716

PRTR Law Cabinet Order No.: 1-256

Molecular Formula: C_7H_7N Structural Formula:

Molecular Weight: 105.14



1. General information

The aqueous solubility of this substance is 2.75 x 10^4 mg/L (20°C), and the partition coefficient (1-octanol / water) (log Kow) is 1.54. The vapor pressure is 2.6 mmHg (= 340 Pa) (25°C, calculated value). Degradability is 0% by BOD degradation rate, and the accumulation factor is thought to be zero or very low. In addition, it does not have hydrolyzable groups.

This substance is 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 for adhesives for tire cord, and as a raw material for insecticides, germicides and so on. Domestic production in 2003 was 1,500 tons (estimated).

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2. Exposure assessment

Total release to the environment in FY2003 under the PRTR Law came to 5.8 tons, all of which was reported. Release to public water bodies accounted for a large part of the reported release. Chemical Industry accounted for high levels of release to both atmosphere and public water bodies.

Release to water bodies accounted for the greatest quantity of release to the environment. The distribution into the different media in the environment predicted by means of a multimedia model was 99.6% for water bodies.

The predicted maximum exposure concentration for inhalation exposure to human beings was approximately 0.020 μg/m^3. The predicted maximum oral exposure was estimated to be less than 1.2 μg/kg/day. As the substance is released primarily to water bodies and the distribution to water is expected to be high, a study should be conducted to determine exposure from water.

The predicted environmental concentration (PEC) that indicates exposure to aquatic organisms could not be determined.

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3. Initial assessment of health risk

Even brief exposure to this substance may result effect on the skin, and delayed onset chemical burns may also occur. It may also cause severe irritation of the eyes and respiratory tract. If inhaled or taken orally, it may cause coughing, headache, nausea, sore throat, nervousness and anorexia.

There is insufficient information regarding the carcinogenicity of the substance, and it is not possible to make a judgment as to whether it causes cancer in humans. For this reason, an initial assessment of the substance was conducted based on information of non-carcinogenic effects.

As the 'Non-toxic level' was observed, used to estimate the margin of exposure (MOE), a no observed effect level (NOEL) of 12.5 mg/kg/day (salivation and squamous cell hyperplasia of the forestomach), obtained from rat medium- and long-term toxicity testings, was obtained for oral exposure. As the test period was short, this value was divided by 10 to establish a value of 1.3 mg/kg/day. No value at 'Non-toxic level' was observed could be established

for inhalation exposure.

With regard to oral exposure, the exposure quantity from water, expected to be the largest contributor to exposure, could not be obtained, and so no predicted maximum quantity could be assessed. For this reason, the health risk could not be determined. For reference purposes, the oral exposure quantity was determined from only food data, and the predicted maximum exposure was less than 1.2 μg/kg/day. As the 'Non-toxic level' of 1.3 mg/kg/day and the predicted maximum exposure were established by animal testing, the value was divided by 10 to derive an MOE exceeding 110. There is thought to be a need to determine exposure from water in order to evaluate the health risk from oral exposure to this substance.

It was not possible to determine the health risk with regard to inhalation exposure. However, although 0.97 ton is released to the atmosphere, almost all of this quantity is predicted to be distributed in water bodies. Moreover, as a reference, if the rate of absorption is postulated to be 100% and the 'Non-toxic level' for oral exposure is converted to the 'Non-toxic level' for inhalation exposure, a value of 4.3 mg/m^3 is obtained. The MOE assessed from this value and the predicted maximum exposure concentration is 22,000. Accordingly, there is thought to be comparatively little need to gather information, etc. on inhalation exposure in order to evaluate the health risk with regard to exposure to the substance in the ambient air.

Knowledge of toxicity				Exposure assessment		Result of risk assessment			Judgment
Exposure path	Guidelines for risk assessment	Animal	Impact assessment guideline (endpoint)	Exposure medium	Predicted maximum exposure quantity and concentration				
Oral	No observed adverse effect level 1.3 mg/kg/day	Rat	Salivation and squamous hyperplasia of the forestomach	Drinking water / food	– μg/kg/day	MOE	–	×	×
				Groundwater / food	– μg/kg/day	MOE	–	×	
Inhalation	No observed adverse effect level – mg/m^3	–	–	Ambient air	0.02 μg/m^3	MOE	–	×	×
				Indoor air	– μg/m^3	MOE	–	×	×

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4. Initial assessment of ecological risk

With regard to acute toxicity, reliable information of a 72-hour EC_{50} growth inhibition value of 61,600 μg/L was found for the algae *Pseudokirchneriella subcapitata*, a 48-hour EC_{50} immobilization value of 9,480 μg/L was found for the crustacea *Daphnia magna* (water flea), and a 96-hour LC_{50} value of 6,480 μg/L was found for the fish *Oryzias latipes* (medaka). Accordingly, an assessment factor of 100 was used, and a predicted no effect concentration (PNEC) of 65 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 27,200 μg/L was found for the algae *P. subcapitata*, and a 21-day NOEC reproduction value of 901 μg/L was found for the crustacea *D. magna*. Accordingly, an assessment factor of 100 was used, and a PNEC value of 9 μg/L was obtained based on the chronic toxicity values. As the PNEC for the substance, a value of 9 μg/L obtained from the chronic toxicity for the crustacea was used.

At the present time, no data have been obtained regarding concentrations in the environment, so the ecological risk could not be determined. A study is needed to implement measurement, etc. of concentrations of this substance in the environment.

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	Chronic	NOEC reproduction	100	9	Freshwater	–	–	×
					Seawater	–	–	

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5. Conclusions

	Conclusions		Judgment
Health risk	Oral exposure	Risk could not be determined. There is a need to determine exposure from water in order to evaluate the health risk.	×
	Oral exposure	Risk cannot be determined. However, there is thought to be comparatively little need to collect information, etc.	×
Ecological risk	Impossible of risk characterization. A study is needed to implement measurement, etc. of concentrations of this substance in the environment.		×

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