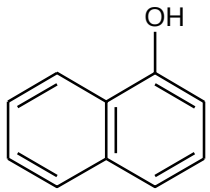
15	CAS No.: 90-15-3	Substance: 1-Naphthol

Chemical Substances Control Law Reference No.: 4-354

PRTR Law Cabinet Order No.:

Molecular Formula: $C_{10}H_8O$ Structural formula:

Molecular Weight: 144.17



1. General information

The aqueous solubility of this substance is 1.11×10^3 mg/1000 g (20°C), the partition coefficient (1-octanol/water) (log K_{ow}) is 2.84, and the vapor pressure is 2.74×10^{-4} mmHg (=0.0365 Pa) (25°C, extrapolated value). Biodegradability (aerobic degradation) is considered to be good. The substance does not possess any hydrolyzable groups in the environment.

This main use for this substance is as an intermediate for Orange-I, Naphthylamine Brown, Eriochrome Blue-Black B, and Eriochrome Black T. The production quantity in 2008 was 60 t (estimated value), and the export quantity and import quantity as naphthol and its salts were 75 t and 386 t, respectively.

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2. Exposure assessment

Because this substance is not designated as 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), 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, the proportion distributed to soil would be greater.

General environmental atmospheric and indoor air data for setting the predicted maximum exposure to humans via inhalation could not be obtained. The predicted maximum oral exposure was estimated to be around 0.00013 μg/kg/day based on calculations from data for public freshwater bodies. The risk of exposure to this substance by intake from an environmental medium via food is considered slight based on estimates of oral exposure using estimated concentrations in fish species.

The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, is around 0.0033 μg/L for public freshwater bodies and around 0.024 μg/L for seawater.

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3. Initial assessment of health risk

This substance is irritating to skin and mucous membrane, and it will cause dermatitis.

Sufficient information could not be obtained on its carcinogenicity, and its initial assessment was conducted on the basis of data on its non-carcinogenic effects.

As for its oral exposure, NOAEL of 130 mg/kg/day (for suppressed body weight increase, degeneration in gastric mucous membrane) obtained from its mid-term and long-term toxicity tests for rats was divided by 10, due to their short test periods, to provide 13 mg/kg/day as its 'non-toxic level*'. For its inhalation exposure, its 'non-toxic level*' could not be established.

As for its oral exposure, its maximum exposure was estimated to be around 0.00013 μg/kg/day, when intakes of freshwater from public water supply were assumed. Its margin of exposure (MOE) would be 10,000,000, when calculated from its 'non-toxic level*' of 13 mg/kg/day and its estimated maximum exposure, and then divided by 10 due to the fact

that the 'non-toxic level*' was obtained from animal experiments. Since its exposure through intakes of food from the environmental media would be limited, MOE will not change significantly even if this exposure is combined. No further action will be required at the moment to assess health risk from oral exposure to this substance.

As for inhalation exposure to this substance, its 'non-toxic level*' was not identified and its exposure concentration was not understood, so its health risk could not be assessed. Its half-life in the atmosphere is 1.2 to 12 hrs. When released to the atmosphere, most of it is expected to go into media other than the ambient air. Collection of information on its inhalation exposure to assess health risk associated with exposure to it in the ambient air would not be required.

Information of toxicity				Exposure assessment		Result of risk assessment			Judgment
Exposure Path	Criteria for risk assessment	Animal	Criteria for diagnoses (endpoint)	Exposure medium	Predicted maximum exposure quantity and concentration				
Oral	'Non-toxic level*' 13 mg/kg/day	Rats	suppressed body weight increase, degeneration in gastric mucous membrane	Drinking water	— μg/kg/day	MOE	—	×	○
				Freshwater	0.00013 μg/kg/day	MOE	10,000,000	○	
Inhalation	'Non-toxic level*' — mg/m^3	—	—	Ambient air	— μg/m^3	MOE	—	×	(○)
				Indoor air	— μg/m^3	MOE	—	×	×

Non-toxic level *

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

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4. Initial assessment of ecological risk

With regard to acute toxicity, the following reliable data were obtained: a 50- to 72-h median effective concentration (EC_{50}) of 14,000 μg/L for growth inhibition in the green algae *Dunaliella bioculata*; a 96-h median lethal concentration (LC_{50}) of 200μg/L for the crustacean *Americamysis bahia* of the family Mysidae; a 96-h LC_{50} of 330 μg/L for the fish species (naked catfish) *Mystus cavasius* of the family Bagridae; and a 48-h EC_{50} of 800 μg/L for developmental inhibition in the Pacific oyster *Crassostrea gigas*. Accordingly, based on these acute toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) of 2 μg/L was obtained. Reliable data for chronic toxicity values could not be obtained and for this reason, the acute toxicity value of 2 μg/L obtained for the crustacean was adopted as the PNEC of this substance.

The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, was 0.002 for freshwater bodies and 0.01 for seawater, indicating that no further work is required at present.

Hazard assessment (basis for PNEC)			Assessment factor	Predicted no effect concentration PNEC (μg/L)	Exposure assessment		PEC/PNEC ratio	Assessment result
Species	Acute/ chronic	Endpoint			Water body	Predicted environmental concentration PEC (μg/L)		
Crustacean Mysidae	Acute	LC_{50} Mortality	100	2	Freshwater	0.0033	0.002	○
					Seawater	0.024	0.01	

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5. Conclusions

	Conclusions		Judgment
Health risk	Oral exposure	No further action required.	○
	Inhalation exposure	Risk can not be assessed. Collection of information would not be required.	(○)
Ecological risk	No need of further work at present.		○

［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.