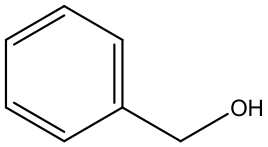
16	CAS No.: 100-51-6	Substance: Benzyl alcohol

Chemical Substances Control Law Reference No.: 3-1011

PRTR Law Cabinet Order No.:

Molecular Formula: C_7H_8O Structural Formula:

Molecular Weight: 108.14



1. General information

The aqueous solubility of this substance is 800 mg/1,000 g (20°C), the partition coefficient (1-octanol/water) (log K_{ow}) is 1.05, and the vapor pressure is 0.11 mmHg (=15 Pa) (25°C). Biodegradability (aerobic degradation) is judged to be good. The substance does not have any hydrolyzable groups

The main use of this substance is as a solvent for paint stripping and commercial floor wax removal (as a replacement for methylene chloride). The production and import quantity in fiscal 2010 was 6,000 t.

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2. Exposure assessment

Because this substance is not classified 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 proportions distributed to individual media by using a Mackay-type level III fugacity model indicated that if equal quantities are released to the atmosphere, water bodies, and soil, the proportions distributed to soil and water bodies are greater.

The maximum expected concentration of exposure to humans via inhalation, based on general environmental atmospheric data, was around 7 μg/m^3. The maximum expected oral exposure was estimated to be generally less than 0.002 μg/kg/day on the basis of 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 obtained by using estimated concentrations in fish species.

The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, was reported to be generally less than 0.05 μg/L for public freshwater bodies and less than 0.05 μg/L for seawater.

3.Initial assessment of health risk

This substance may cause irritation to eyes and skin, and it may possibly affect the central nervous system. Inhalation exposure to this substance may cause coughing, dizziness and headache, while its oral exposure may cause abdominal pain, diarrhea, lethargy, nausea and vomiting. Its contact with skin or eyes may make them red.

As for carcinogenic potential of the substance, an initial assessment was conducted on the basis of information on its non-carcinogenic effects.

With regard to oral exposure to the substance, a NOAEL of no less than 400 mg/kg/day obtained from its mid-term and long-term toxicity tests on rats was adjusted for their durations for intermittent to continuous exposure. Outcome of 290 mg/kg/day was identified to be the reliable lowest dose of the substance as its ‘non-toxic level*’. With regard to its inhalation exposure, its ‘non-toxic level*’ could not be identified.

As for oral exposure to the substance, its maximum exposure concentration would be below 0.002 μg/kg/day, when intakes of freshwater from public water bodies were assumed. The MOE would be above 15,000,000 when calculated from its ‘non-toxic level*’ of 290 mg/kg/day and its maximum exposure concentration predicted from animal experiments, and divided by a factor of 10 to convert animal data to human. As exposure to the substance

in the environment through food intakes would be limited, the MOE would not change significantly even when this exposure was included. Therefore, no further action would be required at this moment to assess health risk from its oral exposure.

With regard to inhalation exposure to the substance, as its 'non-toxic level*' could not be identified, its health risk also could not be assessed. For reference, however, if 100 % absorption were assumed, a 'non-toxic level*' for its oral exposure could be converted to 967 mg/m^3 for its inhalation exposure. The MOE would be 14,000 when calculated from this hypothetical 'non-toxic level*' of 967 mg/m^3 and its predicted maximum exposure concentration. Therefore, collection of further information would not be required at this moment to assess health risk from its inhalation exposure in the ambient air.

Toxicity				Exposure assessment		Result of risk assessment			Judgment
Exposure Path	Criteria for risk assessment	Animal	Criteria for diagnoses (endpoint)	Exposure medium	Predicted maximum exposure dose and concentration				
Oral	'Non-toxic level*' 290 mg/kg/day	Rat	Highest no-effect dose	Drinking water	— μg/kg/day	MOE	—	×	○
				Freshwater	< 0.002 μg/kg/day	MOE	> 15,000,000	○	
Inhalation	'Non-toxic level*' — mg/m^3	—	—	Ambient air	7 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 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.

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4. Initial assessment of ecological risk

With regard to acute toxicity, the following reliable data were obtained: a 72-h EC_{50} of 770,000 μg/L for growth inhibition in the green alga *Pseudokirchneriella subcapitata*, a 48-h EC_{50} of 230,000 μg/L for swimming inhibition in the crustacean *Daphnia magna*, a 96-h LC_{50} of 10,000 μg/L for the fish species *Lepomis macrochirus* (bluegill), and a 40-h IGC_{50} of 731,000 μg/L for reproductive inhibition in the ciliate protozoa *Tetrahymena pyriformis*. Accordingly, based on these acute toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) of 100 μg/L was obtained.

With regard to chronic toxicity, the following reliable data were obtained: a 72-h NOEC of 309,000 μg/L for growth inhibition in the green alga *P. subcapitata*, and a 21-d NOEC of 51,000 μg/L for reproductive inhibition in the crustacean *D. magna*. Accordingly, based on these chronic toxicity values and an assessment factor of 100, a PNEC of 510 μg/L was obtained.

The value of 100 μg/L obtained from the acute toxicity to the fish species was used as the PNEC for this substance.

The PEC/PNEC ratios for freshwater bodies and seawater were both less than 0.0005. Accordingly, further work is considered unnecessary at this time.

Hazard assessment (basis for PNEC)			Assessment factor	Predicted no effect concentration PNEC (μg/L)	Exposure assessment		PEC/PNEC ratio	Judgment based on PEC/PNEC ratio	Assessment result
Species	Acute/ chronic	Endpoint			Water body	Predicted environmental concentration PEC (μg/L)			
Fish (bluegill)	Acute	LC_{50} mortality	100	100	Freshwater	<0.05	<0.0005	○	○
					Seawater	<0.05	<0.0005		

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5. Conclusions

	Conclusions		Judgment
Health risk	Oral exposure	No need for further work.	○
	Inhalation exposure	Although risk to human health could not be identified, collection of further 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.