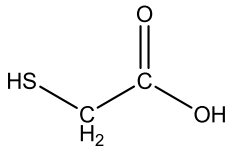
5	CAS No.: 68-11-1	Substance: Mercaptoacetic acid

Chemical Substances Control Law Reference No.: 2-1355

PRTR Law Cabinet Order No.:

Molecular Formula: $C_2H_4O_2S$ Structural Formula:

Molecular Weight: 92.12



1. General information

This substance is freely miscible in water, the partition coefficient (1-octanol/water) (log K_{ow}) is 0.09, and the vapor pressure is 0.075 mmHg (＝10 Pa) (20°C). Biodegradability (aerobic degradation) is judged to be good. The substance does not have any hydrolyzable groups.

The main uses of this substance are as a stabilizer for processing polyvinyl chloride resin and rubbers, a corrosion inhibitor, an antioxidant, a fertilizer, an animal fiber processing agent, a heavy metal scavenger, and a reagent for colorimetric analysis of iron. The production and import quantity in fiscal 2010 was 3,000 t.

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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 2009 under the PRTR Law was approximately 4.1 t, of which approximately 1.4 t or 36% of overall releases were reported. The major destination of reported releases was public water bodies. In addition, 22 t was transferred to waste materials, and 2.0 t was transferred to sewage. Industry types with large reported releases were the chemical industry for the atmosphere, and the steelmaking industry for public water bodies. The largest release among releases to the environment including those unreported was to water bodies. 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 or water bodies in particular, the predicted proportion distributed to water bodies was 99.9%.

The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, was reported to be 0.022 μg/L for public freshwater bodies, and generally 0.0031 μg/L for seawater. When reported releases to public freshwater bodies in fiscal 2009 according to the PRTR Law were divided by the ordinary water discharge of the national river channel structure database, estimating the concentration in rivers while taking into consideration only dilution gave a maximum value of 0.35 μg/L.

3.Initial assessment of ecological risk

With regard to acute toxicity, the following reliable data were obtained: a 72-h EC_{50} of more than 4,430 μg/L for growth inhibition in the green alga *Pseudokirchneriella subspicatus*, a 48-h EC_{50} of 35,800 μg/L for swimming inhibition in the crustacean *Daphnia magna*, a 96-h LC_{50} of 39,800 μg/L for the fish species *Oryzias latipes* (medaka), and a 9-h LC_{50} of 83,000 μg/L for reproductive inhibition in the ciliate protozoan *Tetrahymena pyriformis*. Accordingly, based on these acute toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) in excess of 44 μg/L was obtained.

With regard to chronic toxicity, the following reliable data were obtained: a 72-h NOEC of 424 μg/L for growth inhibition in the green alga *P. subcapitata* and a 21-d NOEC of 1,700 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 4.2 μg/L was obtained.

The value of 4.2 μg/L obtained from the chronic toxicity to the algae was used as the PNEC for this substance.

The PEC/PNEC ratio was 0.005 for freshwater bodies and 0.0007 for seawater. In addition, the maximum river concentration was estimated to be 0.35 μg/L from reported releases under the PRTR Law, and the ratio of this value to the PNEC is less than 0.1. Accordingly, further work on this substance 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)			
Green algae	Chronic	NOEC growth inhibition	100	4.2	Freshwater	0.022	0.005	○	○
					Seawater	0.0031	0.0007		

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4. Conclusions

	Conclusions	Judgment
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.