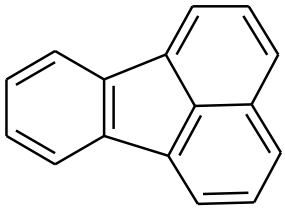
16	CAS No.: 206-44-0	Substance: Fluoranthene

Chemical Substances Control Law Reference No.: 4-2

PRTR Law Cabinet Order No.:

Molecular Formula: $C_{16}H_{10}$ Structural formula:

Molecular Weight: 202.25



1. General information

The aqueous solubility of this substance is 0.26 mg/1000g (25°C), partition coefficient (1-octanol/water) (log K_{ow}) is 5.07, and the vapor pressure is 1.23×10^{-8} mmHg (=1.64×10^{-6} Pa) (25°C, extrapolated value). The biodegradability (aerobic degradation) is characterized by a mean value of 0% for BOD, TOC, and GC, (concentrations of substances tested: 5 mg/L, 10 mg/L). The substance does not have any hydrolyzable groups.

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2. Exposure assessment

Because this substance is not 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.

The predicted maximum exposure to humans via inhalation, based on general environmental atmospheric data, was approximately 0.0071 μg/m^3. The predicted maximum oral exposure was estimated to be less than around 0.00052 μg/kg/day based on calculations from data for groundwater. Furthermore, there is a report of around 0.06 μg/kg/day calculated from food data, albeit from a limited area.

The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, was less than around 0.013 μg/L for both public freshwater bodies and seawater. Furthermore, while no data has been reported within the past 10 years, there is a report of around 0.043 μg/L for a limited area of seawater (1997).

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3. Initial assessment of health risk

This substance has been reported to cause acute poisoning such as thermal burns to skin and eyes upon contact, nausea, cardiac arrhythmia and pneumonedema.

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 125 mg/kg/day (for increase of liver weight and GPT) 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 less than around 0.00052 μg/kg/day, when intakes of groundwater were assumed. Its margin of exposure (MOE) would be 2,500,000 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 'non-toxic level*' was obtained from animal experiments. Its intakes through food up to 0.06 μg/kg/day have been reported for some location. For information, if this is combined with its estimated maximum exposure through groundwater to produce 0.06 μg/kg/day for calculation of MOE, it will be 22,000. 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 health risk could not be assessed. For information, the 'non-toxic level' for its oral exposure, if 100% absorption is assumed for it, turns to be the 'non-toxic level' of 43 mg/m^3 for its inhalation exposure. When combined with its estimated maximum exposure concentration, MOE will be calculated to be 610,000. Its half-life in the atmosphere is 1.3 to 13 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 inhalation exposure 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	Mice	increase of liver weight and GPT	Drinking water	—	μg/kg/day	MOE	—	×	○
				Groundwater	< 0.00052	μg/kg/day	MOE	> 2,500,000	○	
Inhalation	'Non-toxic level*' — mg/m^3	—	—	Ambient air	0.0071	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 72-h median effective concentration (EC_{50}) of 530 μg/L for growth inhibition in the green algae *Pseudokirchneriella subcapitata*; a 96-h median lethal concentration (LC_{50}) of 1.4 μg/L for the crustacean *Americamysis bahia* in the family Mysidae; and a 96-h LC_{50} of 7.7 μg/L for the fish species *Oncorhynchus mykiss* (rainbow trout). Accordingly, based on these acute toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) of 0.014 μg/L was obtained. Furthermore, a 48-h EC_{50} of 1.09 μg/L was obtained for developmental inhibition/mortality in *Mulinia lateralis* in the family Mactridae; when this organism was adopted, the reference value for PNEC based on the acute toxicity value was 0.011 μg/L.

With regard to chronic toxicity, the following reliable data were obtained: a 31-d no observed effect concentration (NOEC) of 0.6 μg/L for mortality in the crustacean *A. bahia* in the family Mysidae, and a 32-d NOEC of 1.4 μg/L for mortality in the fish species *Pimephales promelas* (fathead minnow). Accordingly, based on these chronic toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) of 0.006 μg/L was obtained. The value of 0.006 μg/L obtained from the chronic toxicity to the crustacean was used as the PNEC for this substance.

The PEC/PNEC ratio was less than 2 for both freshwater bodies and seawater, and a judgment cannot be made at this point in time. The view is that environmental concentrations for this substance need to be understood in detail. While no data has been reported within the past 10 years, there is a report (1997) of around 0.043 μg/L for seawater, albeit for a limited area, and the ratio of this concentration and PNEC is 7.

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	Chronic	NOEC Mortality	100	0.006	Freshwater	<0.013	<2	× (▲)
					Seawater	<0.013	<2	

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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	A judgment cannot be made at this point in time. The view is that environmental concentrations for this substance need to be understood in detail. Furthermore, while no data has been reported within the past 10 years, there is a report (1997) of around 0.043 μg/L for seawater, albeit for a limited area, and the ratio of this concentration and PNEC is 7.		(▲)

［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.