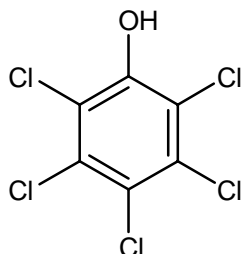| 6	CAS No.: 87-86-5	Substance: Pentachlorophenol

Chemical Substances Control Law Reference No.: 3-2850

PRTR Law Cabinet Order No.: 1-303

Molecular Formula: C_6HCl_5O

Molecular Weight: 266.34

Structural Formula:

1. General information

The aqueous solubility of this substance is 14 mg/L (20°C) and the partition coefficient (1-octanol / water) (log Kow) is 3.32 (pH = 7.2). The vapor pressure is 1.1×10^{-4} mmHg (= 1.5×10^{-2} Pa) (20°C). Degradability (aerobic degradation) in terms of BOD-based degradation percentage is estimated to be 1%. The bioconcentration of this substance is determined to be zero or very low.

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). This substance was used primarily as a protect material of wood, a plant growth regulator and a weed killer. The registration of this substance as an agricultural chemical became null and void in 1990, and there was no report of production of this substance by the investigation in FY2003. The quantity of production in 1984 was 53 tons.

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2. Exposure assessment

Total release to the environment in FY2004 under the PRTR Law came to 0 tons. When predictions of distribution ratios by medium were made using the Mackay-Type Level III Fugacity Model, in the event of equal release to the atmosphere, water and soil, the distribution ratio was highest for soil.

The predicted environmental concentration (PEC) that indicates exposure to aquatic organisms was estimated to be approximately 0.00092 µg/L for freshwater and approximately less than 0.05 µg/L for seawater public water bodies.

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3. Initial assessment of ecological risk

With regard to acute toxicity, reliable information of a 96-hour EC_{50} growth inhibition value of 90 µg/L was found for the algae *Desmodesmus subspicatus*, a 48-hour EC_{50} value of 52 µg/L was found for the crustacea *Calamoecia lucasi*, and a 96-hour LC_{50} value of 18 µg/L was found for the fish *Oncorhynchus mykiss* (rainbow trout), and a 24-hour LC_{50} value of 24 µg/L was found for the other organism, *Dreissena polymorpha* (zebra mussel). Accordingly, an assessment factor of 100 was used, a predicted no effect concentration (PNEC) of 0.18 µg/L was obtained based on the acute toxicity values. With regard to chronic toxicity, reliable information of a 96-hour no observed effect concentration (NOEC) growth inhibition value of 40 µg/L was found for the algae *Pseudokirchneriella subcapitata*, a 21-day NOEC reproduction value of 46 µg/L was found for the crustacea *Daphnia magna*, a 40-day NOEC growth inhibition value of 13 µg/L for the fish *Oryzias latipes* (medaka), and a 36-day NOEC reproduction value of less than 26 µg/L for the congeneric species of Physidae, *Physa gyrina*. So an assessment factor of 10 was used, and a PNEC value of 1.3 µg/L was obtained based on the chronic toxicity values. As the PNEC for the substance, a value of 0.18 µg/L obtained from the acute toxicity for the fish was used.

The PEC/PNEC ratio was 0.005 for freshwater bodies, and less than 0.3 for seawater bodies. Although the ecological risk could not be determined, from the profile of detection of it in freshwater bodies, the registration as the agricultural chemical becoming null and void, and the PPTR data, it is expected that the PEC/PNEC ratio may decrease below 0.1 even in seawater bodies. Thereafter, it is considered to need for the monitoring of the change in quantity of release to 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)		
Fish (rainbow trout)	Acute	LC$_{50}$ Mortality	100	0.18	Freshwater	0.00092	0.005	×
					Seawater	< 0.05	< 0.3	

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4. Conclusions

	Conclusions	Judgment
Ecological risk	Impossible of risk characterization. It is considered to need for the monitoring of the change in quantity of release to the environment.	×

〔Risk judgments〕　　○: No need of further work　▲: Requiring information collection

　　　　　　　　　　■: Candidates for further work　×: Impossible of risk characterization