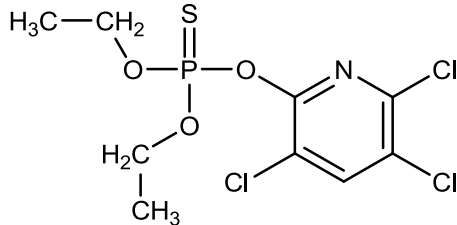


1	CAS No.: 2921-88-2	Substance: Chlorpyrifos
<p>Chemical Substances Control Law Reference No.: 5-3724 PRTR Law Cabinet Order No.*: 1-249 Molecular Formula: C₉H₁₁Cl₃NO₃PS Molecular Weight: 350.59</p> <p style="text-align: right;">Structural formula:</p>  <p>*Note: No. in Revised Cabinet Order enacted on October 1, 2009</p>		
<p>1. General information</p>		
<p>The aqueous solubility of this substance is 0.73 mg/1000g (20°C), the partition coefficient (1-octanol/water) (log K_{ow}) is 5.27, and the vapor pressure is 1.87×10⁻⁵ mmHg (=2.49×10⁻³ Pa) (25°C). The biodegradability (aerobic degradation) is characterized by a BOD degradation rate of 0.2%, and bioaccumulation is thought to be at a medium level. Furthermore, its half-life for hydrolysis is 62 days (pH=4.7, distilled water, 25°C), 35 days (pH=6.9, distilled water, 25°C), and 22 days (pH=8.1, distilled water, 25°C).</p> <p>This substance is a registered agricultural chemical under the Agricultural Chemicals Regulation Law, designated as a Type II and Type III Monitoring Chemical Substance under the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances, and 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). This substance is primarily an active ingredient in organophosphate pesticides; it is blended with dilutants, auxiliaries or other pesticides, formulated in various forms such as wettable powders and emulsions, and used widely. The production quantity in 2008 as an active ingredient was 15 t.</p>		
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<p>2. Exposure assessment</p>		
<p>Total release to the environment in fiscal 2007 under the PRTR Law was 91 t, and all releases were unreported. Distribution by medium in the environment predicted by using a multi-media model indicated that the proportion distributed to soil was an estimated 99.8% for areas where the greatest releases were to the environment and soil.</p> <p>The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, is less than around 0.3 µg/L for public freshwater bodies and less than around 0.01 µg/L for seawater.</p>		
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<p>3. Initial assessment of ecological risk</p>		
<p>With regard to acute toxicity, the following reliable data were obtained: a 96-h median effective concentration (EC₅₀) of 138 µg/L for growth inhibition in the Chrysophyceae algae <i>Isochrysis galbana</i>; a 96-h median lethal concentration (LC₅₀) of 0.035 µg/L for the Mysidacea crustacean <i>Americamysis bahia</i>; a 48-h LC₅₀ of 0.035 µg/L for the Daphniidae crustacean <i>Daphnia ambigua</i>; and a 96-h LC₅₀ of 0.4 µg/L for the fish species <i>Menidia peninsulae</i> (silverside). Accordingly, based on these acute toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) 0.00035 µg/L was obtained. A 10-d LC₅₀ of 0.07 µg/L for the bloodworm <i>Chironomus tentans</i> was also obtained.</p> <p>With regard to chronic toxicity, the following reliable data were obtained: a 96-h no observed effect concentration (NOEC) of 400 µg/L for growth inhibition in the green algae <i>Dunaliella tertiolecta</i>; a 32-d NOEC of 0.045 µg/L for</p>		

reproductive inhibition in the crustacean *Ceriodaphnia* cf. *dubia* that belongs to the same genus as *Ceriodaphnia dubia*; and a 35-d NOEC of 0.14 µg/L for growth inhibition in the fish species *Leuresthes tenuis* (California grunion). A 21-d NOEC of 15 µg/L for mortality in the freshwater mussel *Lampsilis siliquoidea* was also obtained. Accordingly, based on these chronic toxicity values and an assessment factor of 10, a predicted no effect concentration (PNEC) of 0.0045 µg/L was obtained. The value of 0.00035 µg/L obtained from acute toxicity to the crustacean was used as the PNEC for this substance.

The PEC/PNEC ratio was less than 860 for freshwater bodies and less than 29 for seawater, and a judgment cannot be made at present. A concentration of 0.04 µg/L was detected in public freshwater bodies in fiscal 2000, and the ratio of this concentration and PNEC is 110. To augment environmental concentration data, use trends, production and import quantities, and releases to the environment for this substance should be considered where necessary.

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 / <i>Daphnia ambigua</i>	Acute	LC ₅₀ Mortality	100	0.00035	Freshwater	<0.3	<860	× (▲)
					Seawater	<0.01	<29	

4. Conclusions

	Conclusions	Judgment
Ecological risk	Judgment cannot be made at present regarding risk. A concentration of 0.04 µg/L was detected in public freshwater bodies in fiscal 2000, and the ratio of this concentration and PNEC is 110. To augment environmental concentration data, use trends, production and import quantities, and releases to the environment for this substance should be considered where necessary.	(▲)

- [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.