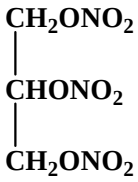
4	CAS No.: 55-63-0	Substance: Nitroglycerin

Chemical Substances Control Law Reference No.: 2-1574

PRTR Law Cabinet Order No.: 1-236

Molecular Formula: $C_3H_5N_3O_9$ Structural Formula:

Molecular Weight: 227.09



1. General information

The aqueous solubility of this substance is 1.38 x 10^3 mg/L (20°C), and the partition coefficient (1-octanol / water) (log Kow) is 1.62. The vapor pressure is 2.00 x 10^{-4} mmHg (= 0.0267 Pa) (20°C). Biodegradability as assessed with the shaker flask method using activated sludge is 53.6% degradation (30°C) in a five-day period. In terms of hydrolyzability, the half-life is calculated to be 1.0 - 10 years (at 25°C, pH = 8 - 7) or 2.6 - 26 years (18°C, pH = 8 - 7).

This substance is 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). Its primary uses and release sources are as a base material for dynamite, as a base compound in smokeless powder, and as a pharmaceutical. Nitroglycerine is almost never shipped in liquid form to locations outside the factory; it is processed into dynamite on the factory premises. Domestic production (shipment) and import quantities in FY2001 were from 100 to less than 1,000 tons. Production and import quantities under the PRTR law are 100 tons.

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2. Exposure assessment

Total release to the environment in FY2003 under the PRTR Law came to 1.3 tons, all of which was reported. The quantity of reported release was 1.2 tons into the atmosphere and 0.088 tons into public water bodies. Chemical Industry accounted for high levels of reported release.

Release to the atmosphere accounted for the greatest quantity of release to the environment. However, the distribution into the different media in the environment predicted by means of a multimedia model was 66.4% for water bodies and 32.1% for soil.

It was not possible to establish a predicted environmental concentration (PEC) that indicates exposure to aquatic organisms, as environmental concentrations have not been obtained.

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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 400 µg/L was found for the algae *Pseudokirchneriella subcapitata*, a 48-hour LC_{50} value of 32,000 µg/L was found for the crustacea *Daphnia magna* (water flea), and a 96-hour LC_{50} value of 1,670 µg/L was found for the fish *Lepomis macrochirus* (bluegill). Accordingly, an assessment factor of 100 was used, and a predicted no effect concentration (PNEC) of 4 µg/L was obtained based on the acute toxicity values. As reliable data could not be obtained for chronic toxicity, a value of 4 µg/L obtained from the acute toxicity for the algae was used as the PNEC for the substance.

As sufficient data on environmental concentrations to enable assessment have not been obtained at present, it was not possible to assess the ecological risk. Trends in production quantities and environmental release quantities should be determined, and at the same time a study should be conducted to assess the need for determination of the

environmental concentration.

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)		
Algae	Acute	EC_{50} growth inhibition	100	4	Freshwater	–	–	×
					Seawater	–	–	

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4. Conclusions

	Conclusions	Judgment
Ecological risk	Impossible of risk characterization. Trends in production quantities and environmental release quantities should be determined, and at the same time a study should be conducted to assess the need for determination of the environmental concentration.	×

［Risk judgments］○: No need of further work ▲: Requiring information collection
■: Candidates for further work ×: Impossible of risk characterization