

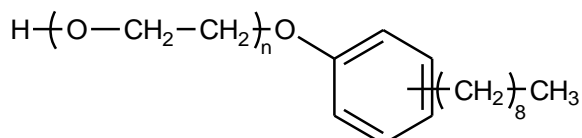
10	CAS No.: 9016-45-9 ( <i>o</i> -, <i>m</i> -, <i>p</i> -isomeric mixture), 26027-38-3 ( <i>o</i> -isomer), 51938-25-1 ( <i>p</i> -isomer), 20427-84-3 ( <i>p</i> -isomer, 2EO)	Substance: Poly(oxyethylene)=nonylphenylether
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Chemical Substances Control Law Reference No.: 7-172 (Polyoxyalkylene (C=2–4,8) mono [alkyl or alkenyl (C=1–18) phenyl] ether (n=1–150))

PRTR Law Cabinet Order No.: 1-309 (Cabinet Order No. after revision\*: 1-410)

Molecular Formula:  $C_{15+2n}H_{24+4n}O_{1+n}$  Structural Formula:

(n indicates number of moles of ethylene oxide added.)



Molecular Weight: 660.87(10EO)

(10EO means that 10 moles of ethylene oxide have been added.)

\*Note: No. according to revised order enacted on October 1, 2009.

### 1. General information

The aqueous solubility of this substance is 0.83 mg/L (25°C, calculated value), and the vapor pressure is  $9.7 \times 10^{-13}$  mmHg ( $=1.29 \times 10^{-10}$  Pa) (25°C). The biodegradabilities (aerobic degradation) of polyoxyethylene=nonylphenyl=ether and polyoxyethylene=*p*-nonylphenylether are both characterized by a BOD degradation rate of 0%. The bioaccumulation of both polyoxyethylene=nonylphenylether and poly (polymerization degree=10) oxyethylene=*p*-nonylphenylether is thought to be nonexistent or low.

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), and this continues to be the case after the revision of substances regulated by the PRTR Law (enacted on October 1, 2009). Its main application is as an industrial surfactant (emulsion polymerization agent and dispersant in the manufacture of rubbers and plastics, emulsifier for metals and machine cutting/rolling oil, institutional detergent, detergent used in fiber manufacture, lubricant for fiber forming and spinning, leveling agent for dyeing, dispersant and emulsifier for pigments, paints and inks, pesticide spreading agent, etc.). The combined quantity manufactured and imported quantity in fiscal 2007 was 6,844 t. The production and import category under the PRTR Law is 10,000 t.

### 2. Exposure assessment

Total release to the environment in fiscal 2006 under the PRTR Law was approximately 720 t, of which 34 t (or 5% of overall releases) was reported releases. The major destination of reported releases was water for public use. Besides this, approximately 360 t was transfer to waste. Industry types that reported large emissions to the atmosphere were the printing, publishing and related industry, the metal product manufacturing industry, and the general machinery and tool manufacturing industry. Those that reported releases to water for public use were the steelmaking industry, the general machinery and tool manufacturing industry, and the transportation equipment and machinery manufacturing industry. Of non-reported releases to the environment, the quantity released to soil is estimated to have been the greatest. This substance is a mixture in which the number of moles of ethylene oxide attached and the alkyl group substitution position varies and its composition is not clear. For this reason, a prediction of distribution by environmental medium was not conducted.

The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, was about 18 µg/L for public freshwater bodies (taking into consideration production quantity and the number of survey points and the

trends in concentration detected at those survey points), and less than about 0.1 µg/L for seawater.

### 3. Initial assessment of ecological risk

With regard to acute toxicity, the following reliable data were obtained: a 48-h median effective concentration (EC<sub>50</sub>) of 20,000 µg/L for growth inhibition in the green algae *Pseudokirchneriella subcapitata*; a 48-h median lethal concentration (LC<sub>50</sub>) of 148 µg/L for the crustacean *Daphnia magna*; a 96-h LC<sub>50</sub> of 1,000 µg/L for the fish species *Salmo trutta* (brown trout); and a 48-h EC<sub>50</sub> of 2,800 µg/L for severe coma in the African clawed frog *Xenopus laevis*. Accordingly, based on these acute toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) of 1.5 µg/L was obtained. With regard to chronic toxicity, the following reliable data were obtained: a 96-h no observed effect concentration (NOEC) of 8,000 µg/L for growth inhibition in the green algae *P. subcapitata*; and a 22-d (108-d) NOEC of less than 1 µg/L for developmental inhibition in the fish species *Oncorhynchus mykiss* (rainbow trout). Accordingly, based on these chronic toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) of less than 0.01 µg/L was obtained. The value of less than 0.01 µg/L obtained from the chronic toxicity to the fish was used as the PNEC for this substance.

The PEC/PNEC ratio was more than 1,800 for freshwater bodies. Accordingly, this substance is considered a candidate for detailed assessment.

This substance is highly toxic in the case of a low number of moles of attached ethylene oxide, and high concentrations of substances with a low number of moles of ethylene oxide attached were reported in the fiscal 2004 water quality survey that forms the basis of PEC setting.

It is considered desirable that chronic toxicity tests for fish be conducted on this substance that take into consideration differing toxicities based on the number of moles of attached ethylene oxide, as well as the distribution of number of moles of attached ethylene oxide detected in the environment and the number of moles of attached ethylene oxide in the test substances and decomposition products of the toxicity tests.

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)	Chronic	NOEC Developmental inhibition	100	<0.01	Freshwater	18	>1800	■
					Seawater	<0.1	-	

### 4. Conclusions

	Conclusions	Judgment
Ecological risk	Candidates for further work.	■

[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.