

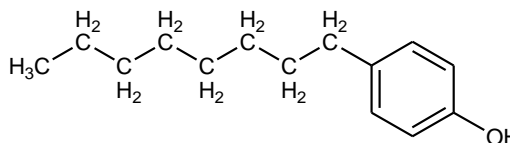
Chemical Substances Control Law Reference No.: 3-503 (monoalkyl (C=3-9) phenol)

PRTR Law Cabinet Order No.: 1-59 (*p*-Octylphenol) (Cabinet Order No. after revision\*: 1-74 (*p*-Octylphenol) )

Structural Formula:

Molecular Formula: C<sub>14</sub>H<sub>22</sub>O

Molecular Weight: 206.32



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

### 1. General information

The aqueous solubility of this substance is 3.1 mg/L (25°C, calculated value), the partition coefficient (1-octanol/water) (log  $K_{ow}$ ) is 5.5 (calculated value), and the vapor pressure is  $1.4 \times 10^{-3}$  mmHg (=0.0131 Pa) (25°C, calculated value). The biodegradability (aerobic degradation) of *p*-(1,1,3,3-tetramethylbutyl)phenol is characterized by a BOD degradation rate of 0%, and bioaccumulation is thought to be nonexistent or low.

*p*-Octylphenol is designated as a Class I 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). *p*-Octylphenol is primarily used as a raw material for oil-soluble phenolic resins employed in adhesives, printing inks, and varnishes, and as a raw material for industrial surfactants (poly(oxyethylene) octylphenylether). The production and import category under the PRTR Law is 10,000 t.

### 2. Exposure assessment

Total release of *p*-octylphenol to the environment in fiscal 2006 under the PRTR Law was 0.30 t, and all releases were reported. All releases were to the atmosphere, and besides these, approximately 200 t was transferred to waste disposal. The chemical industry and the pharmaceutical industry reported releases. The distribution of *p*-octylphenol into each environmental medium, as predicted by means of a multimedia model for the regions with the greatest estimated releases to the environment and atmosphere, was 90.5% to soil.

The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, was estimated to be around 0.03 µg/L for public freshwater bodies and less than around 0.01 µg/L for seawater.

### 3. Initial assessment of ecological risk

With regard to acute toxicity, the following reliable data were obtained: a 72-h median effective concentration (EC<sub>50</sub>) of 138 µg/L for growth inhibition in the green algae *Pseudokirchneriella subcapitata*; a 48-h EC<sub>50</sub> of 417 µg/L for swimming inhibition in the crustacean *Daphnia magna*; and a 96-h median lethal concentration (LC<sub>50</sub>) of 87.8 µg/L for the fish species *Oryzias latipes* (medaka). Accordingly, based on these acute toxicity values and an assessment factor of 100, a predicted no effect concentration (PNEC) of 0.88 µg/L was obtained.

With regard to chronic toxicity, the following reliable data were obtained: a 72-h no observed effect concentration (NOEC) of 21.1 µg/L for growth inhibition in the green algae *P. subcapitata*; a 21-d NOEC of 108 µg/L for reproductive inhibition in the crustacean *D. magna*; and a 43-d NOEC of 3.3 µg/L for developmental inhibition in the fish species *O. latipes* (medaka). Accordingly, based on these chronic toxicity values and an assessment factor of 10, a predicted no effect concentration (PNEC) of 0.33 µg/L was obtained. The value of 0.33 µg/L obtained from the chronic toxicity to the fish was used as the PNEC for this substance.

The PEC/PNEC ratio was 0.09 for freshwater bodies and less than 0.03 for seawater. Accordingly, further work is

thought to be unnecessary at this time.

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 (medaka)	Chronic	NOEC Developmental inhibition	10	0.33	Freshwater	0.03	0.09	○
					Seawater	<0.01	<0.03	

#### 4. Conclusions

	Conclusions	Judgment
Ecological risk	No need 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.