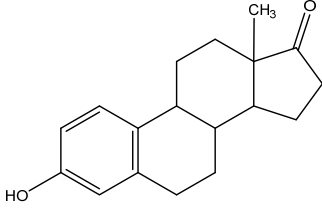


2	CAS No.: 53-16-7	Substance: Estrone
<p>Chemical Substances Control Law Reference No.: 9-2145 (1,3,5(10)-Estratrien-3-ol-17-one)</p> <p>PRTR Law Cabinet Order No.:</p> <p>Molecular Formula: C₁₈H₂₂O₂ Structural Formula:</p> <p>Molecular Weight: 270.37</p> <div style="text-align: right;">  </div>		
<p>1.General information</p> <p>The aqueous solubility of this substance is 1.30 mg/1,000 g (25°C), the partition coefficient (1-octanol/water) (log K_{ow}) is 3.13, and the vapor pressure is <math>7.5 \times 10^{-6}</math> mmHg (<math>0.001</math> Pa) (25°C). The biodegradability (aerobic degradation) is characterized by a CO₂ emission of approximately 37%. In addition, this substance does not possess any hydrolyzable groups and hydrolysis does not occur under ambient environmental conditions.</p> <p>The main uses of this substance are pharmaceuticals (estrogen), and medicinal product additives (medicinal soaps, cosmetics). Further, production of pharmaceuticals (estrogen and progesterone) was valued at 5,684 million yen in fiscal 2018.</p> <p>-----</p> <p>2.Exposure assessment</p> <p>Because this substance is not classified as a Class 1 Designated Chemical Substance under the PRTR Law, release and transfer quantities could not be obtained. Predictions of proportions distributed to individual media by use of a Mackay-type level III fugacity model indicate that if equal quantities were released to the atmosphere, water bodies, and soil, the proportion distributed to soil would be largest.</p> <p>The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, was reported to be around 0.0077 µg/L for public water bodies and around 0.00025 µg/L for seawater. Further, a public freshwater body concentration of 0.0077 µg/L was detected downstream of a sewage treatment plant.</p> <p>-----</p> <p>3.Initial assessment of ecological risk</p> <p>With regard to acute toxicity, the following reliable data were obtained: a 72-h EC₅₀ exceeding 570 µg/L for growth inhibition in the alga <i>Raphidocelis subcapitata</i>, a 48-h LC₅₀ exceeding 1,000 µg/L for the marine copepod <i>Acartia tonsa</i>, a 96-h LC₅₀ exceeding 1,186 µg/L for the fish species <i>Danio rerio</i> (zebra fish), and a 48-h LC₅₀ exceeding 50,000 µg/L for the dugesiid triclad <i>Dugesia japonica</i>. However, a PNEC value could not be derived based on these acute toxicity values because they were all either obtained from limit tests or equivalent to limit tests.</p> <p>With regard to chronic toxicity, the following reliable data were obtained: a 72-h NOEC of 570 µg/L for growth inhibition in the alga <i>R. subcapitata</i>, and a 21-d NOEC exceeding 100 µg/L for reproductive inhibition in the crustacean <i>Tisbe battagliai</i>, and a 27-week NOEC of 0.047 µg/L for reproductive inhibition in the fish species <i>Oryzias latipes</i> (medaka). Accordingly, based on this chronic toxicity value and an assessment factor of 10, a PNEC of 0.0047 µg/L was obtained.</p> <p>The value of 0.0047 µg/L obtained from the chronic toxicity to the fish species was used as the PNEC for this substance.</p> <p>The PEC/PNEC ratio is 1.6 for freshwater bodies and 0.05 for seawater; accordingly, <u>this substance is a candidate for detailed assessment of ecological risk. A comprehensive review of the above findings draws the same conclusion.</u></p>		

Hazard assessment (basis for PNEC)			Assessment coefficient	Predicted no effect concentration PNEC (µg/L)	Exposure assessment		PEC/PNEC ratio	Comprehensive judgment
Species	Acute/ chronic	Endpoint			Water body	Predicted environmental concentration PEC (µg/L)		
Fish <i>Oryzias latipes</i>	Chronic	NOEC Reproductive inhibition	10	0.0047	Freshwater	0.0077	1.6	■
					Seawater	0.00025	0.05	

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