

5	CAS No.: 27344-41-8	Substance: Disodium 2,2'-([1,1'-biphenyl]-4,4'-diyldivinylene)bis(benzenesulphonate)
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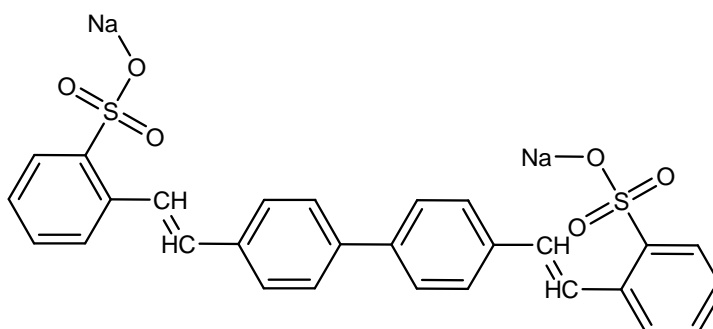
Chemical Substances Control Law Reference No.:

PRTR Law Cabinet Order No.:

Molecular Formula: C₂₈H₂₀Na₂O₆S₂

Structural formula:

Molecular Weight: 562.56



1. General information

The aqueous solubility of this substance is 1.76×10^4 mg/L (20°C), the partition coefficient (1-octanol/water) ($\log K_{ow}$) is -2.32 (pH=6.8, 25°C), and the vapor pressure is less than 5×10^{-18} mmHg ($= < 7 \times 10^{-16}$ Pa) (25°C). Fluorescent whitening agents (FWAs) generally do not readily undergo degradation when tested in conformance to OECD Test Guidelines No. 301. Photodegradation products of 4,4'-distyryl biphenyl derivatives readily degraded in tests conforming to OECD Test Guideline No. 301F. Furthermore, the half-life for hydrolysis is more than 1 year (pH4–9). The main use of this substance is as a fluorescent whitening agent.

2. Exposure assessment

Because this substance is not classified 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), release and transfer quantities could not be obtained. Predictions of distribution by medium using a Mackay-type level III fugacity model indicated that if equal quantities were released to the atmosphere, water bodies, and soil, the proportions distributed to soil would be greater.

The predicted environmental concentration (PEC), which indicates exposure to aquatic organisms, was around 2.3 µg/L for public freshwater bodies and less than around 0.5 µg/L for seawater. Japanese domestic shipments in fiscal 2006 were estimated at approximately 300 t.

3. Initial assessment of ecological risk

With regard to acute toxicity, the following reliable data were obtained: a 72-h EC₅₀ of more than 28,600 µg/L for growth inhibition in the green algae *Pseudokirchneriella subcapitata*, a 48-h EC₅₀ of 20,900 µg/L for swimming inhibition in the crustacean *Daphnia magna*, and a 96-h LC₅₀ of more than 100,000 µg/L for the fish species *Oryzias latipes* (medaka). Accordingly, based on these acute toxicity values and an assessment coefficient of 100, a predicted no effect concentration (PNEC) of 210 µg/L was obtained.

With regard to chronic toxicity, the following reliable data were obtained: a 72-h NOEC of 1,870 µg/L for growth inhibition in the green algae *P. subcapitata*, and a 21-d NOEC of 1,840 µg/L for reproductive inhibition in the crustacean *D. magna*. Accordingly, based on this chronic toxicity value and an assessment coefficient of 100, a predicted no effect concentration (PNEC) of 18 µg/L was obtained. The value of 18 µg/L obtained from the chronic toxicity to the crustacean was used as the PNEC for this substance.

The PEC/PNEC ratio was 0.1 for freshwater bodies and less than 0.03 for seawater. Accordingly, data collection is considered required. Chronic toxicity testing of fish species for this substance and reassessment after lowering of the assessment coefficient is considered desirable.

Hazard assessment (basis for PNEC)			Assessment coefficient	Predicted no effect concentration PNEC ($\mu\text{g/L}$)	Exposure assessment		PEC/PNEC ratio	Judgment based on PEC/PNEC ratio	Assessment result
Species	Acute/chronic	End point			Water body	Predicted environmental concentration PEC ($\mu\text{g/L}$)			
Crustacean <i>Daphnia magna</i>	Chronic	NOEC reproductive inhibition	100	18	Freshwater	2.3	0.1	▲	▲
					Seawater	<0.5	<0.03		

4. Conclusions

	Conclusions	Judgment
Ecological risk	Data collection considered 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.