

BLUEDYE RISK ASSESSMENT: ENVIRONMENT

In EU the substance is used as colouring agent (UC 10) in textile industry (IC 13). The total production of the substance occurs in Switzerland and about 15 tonnes/y are imported in EU. The risk assessment takes into account the use of the substance as colouring agent (processing) as formulation and production occur in an extra-UE country. The PEC values are calculated on the basis of the upper limit of 100 tonnes/y. The substance is widely used so the regional tonnage is 10% of the total tonnage i.e. 10 tonnes/y. The substance is used in dyeing of synthetic nylon fibres and wool. The emission factor for release in water is calculated with the equation of the emission scenario document IC13 of the TDG (2003).

Physico-chemical properties

log₁₀ K_{ow}	0.65 log(10)
MW	456 g/mol
S	2010 mg/l
MP	>400 °C
BP	>400 °C
VP	1 x 10 ⁻⁶ Pa

Biodegradation

In a modified Zahn-Wellens test the substance has shown to be inherently biodegradable (83% of elimination rate within 28 days) and a rate constant for biodegradation in STP of 0.1 hr⁻¹ must be used.

Partition coefficients

The K_{oc} value is calculated using the QSAR for non-hydrophobic substances (TGD, 2003):

$$\log K_{oc} = 0.52 \log K_{ow} + 1.02$$

$$K_{oc} = 22.8$$

Microorganisms in STP

The influence of BLUEDYE on the respiration rate of activated sludge is null at the lowest dose 3.2 mg/l (NOEC); the EC₅₀ value was determined to be 80.5 mg/l.

Aquatic organisms

Daphnia magna

The 48h-EC₅₀ was calculated to be nominally 4.99 mg/l with 95% confidence interval ranging from 4.13 to 5.95 mg/l.

The NOEC after 21 days was 0.602 mg/l

Fish

The LC₅₀ at 96 hr in *Brachydanio rerio* was 4.09 mg/l

The NOEC after 21 days was 0.019 mg/l

Algae

After 72h the effect concentration on biomass (EbC₅₀) was 2.4 mg/l and on growth (ErC₅₀) was 9.1.

The NOEC for both effects was reported to be 0.9 mg/l

PNEC calculation

PNECmicroorganisms-stp

The assessment factor applied in extrapolation to PNECmicroorganisms is 10.
The PNECmicroorganisms in a STP is 0.32 mg/l

PNECwater

The toxicological data used for extrapolation to PNECwater is 0.019 mg/l.
The assessment factor applied in extrapolation to PNECwater is 10.
The PNECwater is 0.0019 mg/l.

PNECsediment

$$\text{PNEC}_{\text{sediment}} = K_{\text{susp-water}} / \text{RHO}_{\text{susp}} * \text{PNEC}_{\text{water}} * 1000 = 2.43 \times 10^{-3} \text{ mg/kgwwt (EUSES 2.0)}$$