FASS

Bortezomib Teva

MREF

Teva

Pulver till injektionsvätska, lösning 3,5 mg
(Vit till gulvit kaka eller pulver)

Cytostatiska/cytotoxiska medel, övriga cytostatiska/cytotoxiska medel

Aktiv substans:
Bortezomib

ATC-kod:
L01XG01

Läkemedel från Teva omfattas av Läkemedelsförsäkringen.

Miljöpåverkan

Miljöinformationen för bortezomib är framtagen av företaget Janssen-Cilag för VELCADE®

Miljörisk: Användning av bortezomib har bedömts medföra försumbar risk för miljöpåverkan.
Nedbrytning: Det kan inte uteslutas att bortezomib är persistent, då data saknas.
Bioackumulering: Bortezomib har låg potential att bioackumuleras.

Detaljerad miljöinformation

Environmental Risk Classification

Predicted Environmental Concentration (PEC)

PEC is calculated according to the following formula:

PEC (µg/L) = $(A*10^{9}*(100-R))/(365*P*V*D*100) = 1.37*10^{-6}*A*(100-R)$

PEC = 0.000022418 µg/L

Where:

A = total actual API sales in Sweden for the most recent year 0.16363573345 kg (total sold amount API in the most recent sales data for Sweden (2022) was distributed by IQVIA in 2023)

R = 0

P = number of inhabitants in Sweden = $10 * 10^6$

V (L/day) = volume of wastewater per capita and day = 200 (ECHA default) (Reference V)

D = factor for dilution of wastewater by surface water flow = 10 (ECHA default) (Reference V)

Predicted No Effect Concentration (PNEC)

Ecotoxicological studies

Algae (*Scenedesmus subspicatus*) (guideline e.g. OECD 201) [Reference I]:

$E\gamma C_{50}$ 72 h (yield) = 0.30 mg/L

NOECγ (yield) = 0.10 mg/L

E_rC_{50} 72 h (growth) = 0.46 mg/L

$NOEC_r$ (growth) = 0.10 mg/L

Crustacean (Daphnia magna) (water-flea) (guideline e.g. OECD 202) [Reference II]:

Acute toxicity

Acute toxicity to water-flea (*Daphnia magna*)

EC_{50} 48 h = 0.45 mg/L (Immobility)

NOEC = 0.17 mg/L

Chronic toxicity

Not available

Fish:

Acute toxicity

Acute toxicity to zebra fish (*Brachydanio rerio*) (guideline e.g. OECD 203) [Reference III]:

LC_{50} 96 h (mortality) = 1.1 mg/L

NOEC < 0.46 mg/L

Chronic toxicity

Not available

Other ecotoxicity data:

Activated sludge respiration inhibition test (guideline e.g. OECD 209) [Reference IV]

EC_{50} 3 h > 1000 mg/L

NOEC 3 h = 714 mg/L

PNEC (µg/l) = lowest EC_{50}/1000, where 1000 is the assessment factor used. E_rC_{50} for the alga *Scenedesmus subspicatus* (0.46 mg/L) and EC50 for *Daphnia magna* (0.45 mg/L) have been used for this calculation since these two species are the most sensitive of the three tested species and for algae, growth is the most reliable endpoint.

PNEC = 0.45 mg/L/1000 = 0.45 µg/L

Environmental risk classification (PEC/PNEC ratio)
PEC/PNEC = 0.000022418/0.45 = 0.00004981 i.e. PEC/PNEC ≤ 0.1

The calculated PEC/PNEC ratio is ≤ 0.1.
Use of Bortezomib has been considered to result in insignificant environmental risk.

Degradation

Biotic degradation

Ready degradability:
Not available.
Inherent degradability: -
Simulation studies:
Not available.
Conclusion for degradation: The potential for persistence of Bortezomib cannot be excluded, due to lack of data.

Abiotic degradation

Hydrolysis: -
Photolysis: -

Bioaccumulation

Partition coefficient octanol/water:
The partition coefficient octanol/water was to determined to be log K_{ow} = 2.8 using unknown internal method. According to ChemSpider ACD/Percepta the log K_{ow} = 2.45. [Reference VI].

Bioconcentration factor (BCF):

According to ChemSpider ACD/BCF (pH7.4) = 15.60. [Reference VI]

Since BCF < 500, Bortezomib has low potential for bioaccumulation.

Conclusion for bioaccumulation: Bortezomib has low potential for bioaccumulation.

Excretion (metabolism)

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PBT/vPvB assessment

	PBT-criteria	Results for Bortezomib
P	DT_{50} freshwater > 40 days or DT_{50} sediment > 120 days	No data available
B	BCF > 2000	BCF = 15.60
T	Chronic NOEC < 0.01 mg/L or CMR or endocrine disrupting	$NOEC_{algae}$ = 0.10 mg//L $NOEC_{daphnia}$ = 0.17 mg/L $NOEC_{fish}$ = 0.45 mg/L

The PBT-criteria are not fulfilled. Therefore, Bortezomib is not considered a PBT-substance.

References

I. Peither A., Bortezomib: Toxicity to *Scenedsmus subspicatus* in a 72-Hour Algal Growth Inhibition Test, OECD 201; RCC Ltd. Study A39958; JnJ Study RMD740; June 30, 2006.
II. Peither A., Bortezomib: Acute Toxicity to Daphnia Magna in a 48-Hour Immobilization Test, OECD 202; RCC Ltd. Study A39971; JnJ Study RMD741; June 30, 2006.
III. Peither A., Bortezomib: Acute Toxicity to Zebra Fish (*Brachydanio rerio*) in a 96-Hour Static Test, OECD 203; RCC Ltd. Study A39993; JnJ Study RMD742; June 30, 2006.
IV. Grützner I., Bortezomib: Toxicity to Activated Sludge in a Respiration Inhibition Test, OECD 209; RCC Ltd. Study A40015; JnJ Study RMD743; March 28, 2006.
V. ECHA, European Chemicals Agency. 2008 Guidance on information requirements and chemical safety assessment. http://guidance.echa.europa.eu/docs/guidance_document/information_requirements_en.htm
VI. Bortezomib, ChemSpider, ID # 343402, July 7, 2015, http://www.chemspider.com/Chemical-Structure.343402.html?rid=8f028c39-d830-42ba-a890-e9384a9aff