

## Tecfidera

**M R F<sub>f</sub>**

### Biogen Sweden

Enterokapsel, hård 120 mg

(Oval kapsel, grön och vit, märkt "BG-12 120 mg" 7,0 x 21,0mm)

Övriga medel med verkan på nervsystemet

### Aktiv substans:

Dimetylfumarat

### ATC-kod:

L04AX07

Läkemedel från Biogen Sweden omfattas av Läkemedelsförsäkringen.

Läkemedlet distribueras också av företag som inte omfattas av Läkemedelsförsäkringen, se Förpackningar.

## Miljöpåverkan

### Dimetylfumarat

Miljörisk: Användning av dimetylfumarat har bedömts medföra försumbar risk för miljöpåverkan.

Nedbrytning: Dimetylfumarat bryts ned i miljön.

Bioackumulering: Dimetylfumarat har låg potential att bioackumuleras.

# Detaljerad miljöinformation

## Detailed background information

## Environmental Risk Classification

### Predicted Environmental Concentration (PEC)

PEC is calculated according to the following formula:

$$PEC (\mu\text{g/L}) = (A \cdot 10^9 \cdot (100 - R)) / (365 \cdot P \cdot V \cdot D \cdot 100) = 1.5 \cdot 10^{-6} \cdot A \cdot (100 - R)$$

$$PEC = 0.029 \mu\text{g/L}$$

Where:

A = 194.8145 kg (total sold amount API in Sweden year 2015, data from IMS Health).

R = 0 % removal rate (due to loss by adsorption to sludge particles, by volatilization, hydrolysis or biodegradation). This is considered a conservative value.

P = number of inhabitants in Sweden =  $9 \cdot 10^6$

V (L/day) = volume of wastewater per capita and day = 200 (ECHA default) (Ref. 1)

D = factor for dilution of waste water by surface water flow = 10 (ECHA default) (Ref. 1)

### Predicted No Effect Concentration (PNEC)

#### Ecotoxicological studies

*Algae (Pseudokirchneriella subcapitata)* (OECD 201) (Ref. 2):

EC50 72h (growth rate) > 1 800  $\mu\text{g/mL}$

NOEC (growth rate) = 37  $\mu\text{g/mL}$

*Crustacean (Daphnia magna):*

Chronic toxicity (OECD 211) (Ref. 3)

NOEC 21 days (reproduction) = 55.9 µg/mL

*Fish (Pimephales promelas):*

Chronic toxicity (OECD 210) (Ref. 4)

NOEC 28 days (survival) = 45.7 µg/mL

*Other ecotoxicity data:*

Calculation of PNEC is obtained by applying assessment factors (AF) to long-term ecotoxicity data (Ref 1):

Lowest NOEC/AF

$PNEC = 3.7 \mu\text{g/L}$

Where:

Lowest NOEC = 37 µg/mL (*Pseudokirchneriella subcapitata*, growth inhibition test)

AF = 10 based on the availability of chronic toxicity studies for three trophic levels

### **Environmental risk classification (PEC/PNEC ratio)**

$PEC/PNEC = 0.029/3.7 = 0.0078$ , i.e.  $PEC/PNEC \leq 0.1$  which justifies the phrase "Use of dimethyl fumarate has been considered to result in insignificant environmental risk."

### **Degradation**

#### **Biotic degradation**

*Ready degradability:*

*Test results showed > 60% degradation within five days (OECD 301) (Ref 5).*

*Justification of chosen degradation phrase:*

Dimethyl fumarate passes the ready degradability test, hence the degradation phrase should be: “*Dimethyl fumarate is degraded in the environment.*”

## **Bioaccumulation**

*Partitioning coefficient:* Log Pow= 0.74 at neutral pH

(experimentally determined with unknown method) (Ref 6).

Since log Pow < 4 at pH 7, dimethyl fumarate is considered to have “low potential for bioaccumulation”.

## **Excretion (metabolism)**

In humans, dimethyl fumarate is extensively metabolised with less than 0.1% of the dose excreted as unchanged dimethyl fumarate in urine. Exhalation of CO<sub>2</sub> is the primary route of dimethyl fumarate elimination accounting for 60% of the dose. Renal and faecal elimination are secondary routes of elimination, accounting for 15.5% and 0.9% of the dose respectively. Primary active metabolite is monomethyl fumarate (Ref 7.).

## **References**

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3. Internal document: Covance Study No. 8253806. Last G. Dimethyl fumarate: Chronic effects to *Daphnia magna*. Report

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