Telomer Research Program

Report Title: 1-Decanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro- Earthworm (*Eisenia fetida*), Acute Toxicity Test in Artificial Soil

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Study Objective: The determination of the effects of 1-Decanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-, on mortality and live weight of the earthworm species, *Eisenia fetida*, in artificial soil according to OECD guideline No.207.

Materials and Methods: Artificial soil (10.5 % peat, 20 % kaolin, 69 % quartz sand, 0.5 % calcium carbonate) was used for testing. The soil was moistened to about 25 % of the maximum water holding capacity and the pH adjusted to 5.94. For adaptation, earthworms were placed on soil separately moistened to about 35 % of the soil dry weight. The test substance was heated to 50 ºC, weighed out, dissolved in *tert*.-methyl-butyl-ether and mixed with 10 g quartz sand. After the solvent volatilized from the sand, the sand was incorporated into soil to produce test substance concentrations of 1000-320-100-32-10 mg/kg dry weight of soil. After 24 hours, treated test substrate was added to glass dishes. The washed earthworms were placed on the surface of the test substrate. Four replicates were used per concentration of the test substance and per control treatment. Ten adult earthworms were used per replicate. At the start and the end of the test, pH and moisture content of the test substrate were determined in every treatment and control using mixed samples of all replicates. The live weight of the earthworms was measured individually on the day of application and on day 14. Mortality, behavior and morphological changes of the earthworms were recorded 7 and 14 days after application. Temperature was maintained at 18-22 ºC with 16 hours of light (491 lux).

Findings: No significant mortality was seen in the tested concentrations 10-320 mg/kg after 14 days of exposure. The highest tested concentration of 1000 mg/kg resulted in a mortality of 45 %. The earthworms in the controls and the 10 to 32 mg/kg test concentrations showed normal behavior with normal reactions to mechanical stimulus and negative phototactic reactions after placing them on the substrate after 7 and 14 days of exposure. In the 100 to 1000 mg/kg test concentrations pathological symptoms and abnormal reactions were observed at 7 and 14 days. The percent loss of live weight was 4 % in the solvent control group and 4 to 34 % in the treatment groups. In the test concentrations ≥ 320 mg/kg, the loss of live weight was ≥ 20 %. A summary of all significant effects in the test concentrations is given in Table 1.

Table 1: Summary of All Significant Effects in the Test Concentrations

Concentrations [mg/kg]					
Effects	10	32	100	320	1000
Mortality	---	---	---	---	+++
Mean loss of live weight	---	---	---	+++	+++
Mean loss of live weight compared to control	---	---	+++	+++	+++
Other symptoms (behavior and pathological symptoms)	___	___	+++	+++	+++
Summary of all test effects	___	___*	+++#	+++	+++

--- = no significant difference
+++ = significant difference
* = NOEC
# = LOEC

Conclusion: Mortality was seen at the test concentrations of 320 and 1000 mg/kg after 14 days of exposure. The live weight was statistically significantly decreased at concentrations ≥ 100 mg/kg when compared to control group during the 14 days of exposure. Pathological symptoms were seen at concentrations ≥ 100 mg/kg. No test substance related mortality, pathological symptoms and reduction in live weight were seen at concentrations ≤ 32 mg/kg. The highest tested concentration with no effect (NOEC) of the test substance with respect to mortality, body weight and other symptoms was 32 mg/kg.