


ECOTOXICITY ELEMENTS
TOXICITY TO TERRESTRIAL ORGANISMS
Soil invertebrates: *Eisenia foetida*

PAPER REVIEWED

Swigert J.P. 1989. Acute toxicity of linear alkylbenzene sulfonate to earthworms (*Eisenia foetida*). ABC Laboratory study report 38316. ABC Laboratories, Columbia, Missouri, USA.

TEST SUBSTANCE

- LAS (Monsanto Company).

 Remarks: The neat material was 35.1 % (w/w) active LAS in an aqueous solution. No further details were given. All data expressed in mg LAS (active substance) / kg d.w. soil (nominal values).

METHOD

- Laboratory Analytical Bio-Chemistry Laboratories Inc. Aquatic Toxicology Division. 7200 East ABC Lane, Columbia, Missouri, USA.
- Objectives To determine the toxicity of LAS towards the earthworm *Eisenia foetida* on the basis of mortality, growth and cocoon production after 7 to 14 days exposure.
- Method/guideline followed OECD guideline 207 (OECD 1984).
- Test substrate/application Artificial soil as described by OECD (1984).
- Spiking method Appropriate weights of the LAS solution (35.1 % LAS in water) were mixed with 1.16 L of deionized water and added to 2.44 kg of artificial soil, resulting in 5 LAS spiked soils (5 concentrations) with a water content of 35%.
- GLP Yes.
- Year (study performed) 1989.
- Species/strain/supplier Earthworms were obtained from Vittor and Associates, Mobile, Alabama, USA.
- Analytical monitoring Nominal concentrations in the test (day 0, 7 and 14)

were measured by Monsanto Company.

- Exposure period 14 days.
- Endpoints Mortality, burrowing time, fresh weight, growth, general health (not quantitative), behaviour (not quantitative) and cocoon production (not quantitative).
- Statistical methods Anova analysis, followed by linear contrasts was performed for the weight data.

 Remarks: /

RESULTS

- Nominal concentrations 0, 63, 125, 250, 500, 1000 mg LAS / kg d.w.
- Measured concentrations Although more analyses were performed, only the data from the 250 mg LAS / kg d.w. were presented in the reviewed paper.
- NOEC, LOEC, EC50, EC10 The NOECweight (7 and 14 days) was 250 mg LAS / kg d.w., the LOECweight (7 and 14 days) was 500 mg LAS / kg d.w. The data were not sufficient to calculate an LC10 or LC50: only 2.5 % mortality occurred after 14 days. ECx values were not given in the reviewed manuscript. We calculated ECx values for weight, growth and burrowing based on Vanewijk and Hoekstra (1993, Table 1).

 Remarks: /

CONCLUSIONS

The lowest EC10 value was found for growth (7 days), 277 mg LAS / kg d.w. (Table 1).

RELIABILITY

Klimisch score 1b (comparable to guideline study): performed under GLP according to guideline (OECD 1984), but only limited measured concentrations available; tested compound not fully described.

REFERENCES

OECD 1984. OECD guideline for testing chemicals nr. 207. Earthworm, acute toxicity tests.
 Vanewijk, P.H., Hoekstra, J.A. 1993. Calculation of the EC50 and its confidence interval
 when subtoxic stimulus is present. *Ecotoxicology and Environmental Safety*, 25, 25-32.

ECx calculations performed by the reviewer (Versonnen B., Ghent University)

Table 1 represents the results of our ECx calculations based on the raw data of the experiments.

Table 1: Calculated ECx values and confidence intervals (mg LAS / kg d.w.) performed according to Vanewijk and Hoekstra (1993) for *Eisenia foetida*, exposed to LAS.

Endpoint	Exposure time	EC10	EC50	Hormesis
Weight	7 days	360 (199-652)	1193 (919-1549)	No
	14 days	417 (259-671)	1160 (945-1422)	No
Growth	7 days	277 (112-687)	740 (522-1051)	No
	14 days	311 (161-600)	729 (557-953)	No
Burrowing	7 days	659 (541-804)	1000 (971-1030)	No