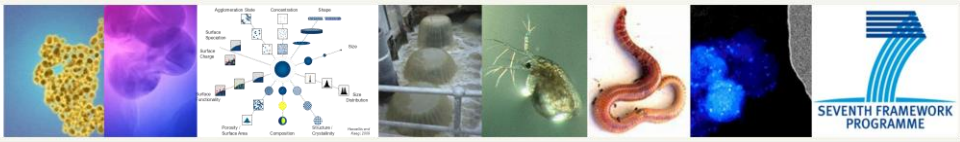

NanoFATE Deliverable 6.5

Briefing note detailing approach for generation of SSD distributions; includes CeO_2, ZnO and Ag in dissolved metal ions and ENP forms

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Research Report Summary

For a proper risk assessment of engineered nanoparticles (ENPs) in the environment, it is essential to assess a level of ENPs that is safe to ecosystems. Such a safe level, also indicated as Predicted No-Effect Concentration (PNEC), is usually derived from laboratory toxicity data, using either application factors (AF) or Species-Sensitivity Distributions (SSDs). The method most suitable will depend on the type and number of ecotoxicity data available and also on the representation of organisms indicative for the ecosystem to be protected, e.g. aquatic (freshwater, marine) or terrestrial organisms. This is the current approach for organic chemicals and metals. In Deliverable 6.4 we explored the option of applying SSDs for the hazard characterization of ENPs.

This deliverable applies the SSD approach to data available for ZnO ENPs and Ag ENPs, together with their ionic forms (Zn, Ag). The SSDs were applied to data taken from the literature as well as data generated within NanoFATE, separately and in combination. Additionally, ecological traits and phylogenetic classifications were chosen to evaluate differences on SSD outputs regarding the particulate form or the ionic metal form. Within this approach, traits for reproduction and feeding strategy or a broader taxonomic approach based on Phyla were used to build the SSDs and derive Hazard Concentrations for 5% of the species (HC5). This output will be crucial to derive risk assessments for these two specific nanoparticles and their respective ionic forms.

For CeO2 ENPs, unfortunately only few data were available. The available data suggest that these ENPs have low toxicity to soil organisms with effects predicted to occur at concentrations higher than 1000 mg/kg dry soil. For aquatic organisms, *Daphnia magna* showed low sensitivity to CeO2, with reproduction being affected only at concentrations above 3 mg/L.

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