



Effects of environmental factors on graphene oxide ecotoxicity towards crustacean *Daphnia magna*

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ABSTRACT

Growing popularity of graphene-based nanomaterials raises awareness about its environmental behavior and impact. Literature provides evidence on the influence of environmental factors on nanomaterials ecotoxicity. The purpose of this study was to evaluate the different medium composition and lighting effects on the acute ecotoxicity of graphene oxide on crustacean *Daphnia magna*. Standard Organisation for Economic Co-operation and Development 202 methodology [5] was used. Experiments were performed with four different artificial waters according to American Society for Testing and Materials (very soft, soft, hard, and very hard) and under two different lighting regimes—illuminated and in darkness. An increase of the toxic effect with incubation time was observed. Effective concentrations EC50 after 48 h of incubation were nearly two times lower than that after 24 h. It was found that in media with lower hardness the toxicity of graphene oxide increases when compared with harder water. Calculated EC50-48 h values were 159.17 and 167.79 mg/L in very soft water and 500.40 and 470.89 mg/L in very hard water, in illuminated and non-illuminated assays, respectively. No significant differences were found when comparing illuminated and non-illuminated variants of the experiment.

Keywords: Graphene oxide; *Daphnia magna*; Ecotoxicity

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