Investigation of Ecological Toxicity of Nano Co_2O_3 on *Daphnia magna*

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Abstract

Due to the increasing production of nanoparticles and their useful applications in biological systems, so far few studies have been conducted on the side effects of these substances on living organisms. The special and unique properties of nanoparticles will also lead to unique potential hazards. On the other hand, nanoparticles may have different effects under different conditions and damage living organisms by entering aquatic ecosystems. Therefore, in this study, in order to evaluate the effects of nanoparticles in aqueous media, Co_2O_3 nanoparticles on hard freshwater zooplankton, *Daphnia magna*, were used in both distilled water and Karun River water in Ahvaz in 2018. Accordingly, Daphnia magna was exposed to concentrations of 1, 5, 10, 20, 50 and 100 nanoparticles for 96 hours at a temperature of 20-25 ° C. Important water quality parameters such as dissolved oxygen (DO), temperature, acidity (pH) were controlled according to the standard during the experiment. LC_{50} was statistically analyzed at 24, 48, 96.72 hours using Probit methods. LC_{50} values of 96 hours for cobalt nano oxide in distilled water and Karunriver water were 121.04 and 95.902 mg /l, respectively. According to the results of this study, the mortality rate of *D.magna* in the presence of cobalt oxide nanoparticles in samples containing river water is higher than samples of distilled water, which may be due to the possible presence of other pollutants and their interaction effects in natural environments. SAFE (Safety Factor) and SAR (Safe Application Rate values for this nanoparticle were also recommended in both environments.

Keywords: Acute toxicity, Bioassay, *Daphnia magna*, Karun River, Cobalt Nano Oxide.

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