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UPTAKE AND EFFECTS OF NICKEL OXIDE AND COBALT OXIDE NANOPARTICLES ON ARTEMIA

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Abstract—Aquatic environments are repositories for nanomaterials as well as for many toxic substances. Fish are excellent sentinels of environmental health as they are sensitive to a wide range of xenobiotic chemicals. In this study, aquatic stability and impact of engineered nickel oxide (NiO 40-60 nm) and cobalt oxide (CoO <100 nm) nanoparticles were investigated using Artemia salina. Acute exposure was conducted on nauplii (larvae) in seawater in a concentration range from 0.2 to 50 mg/L NPs for short term (24 h) and long term (96 h). Accumulation limits were measured along with toxic effects. Both suspensions of NPs were not acutely toxic to artemia at environmentally feasible levels, but the suspensions of NiO NPs induced more toxicity than CoO NPs under similar exposure regime. Prolonged exposure caused oxidative stress. MDA levels increased significantly with increasing NP concentration and exposure time. The results indicated that NiO and CoO NPs exhibit toxic effects to artemia under long-term exposure.

Keywords: CoO nanoparticle, NiO nanoparticles, Accumulation, Oxidative stress, Artemia salina

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