# Nanotoxicological effect of the coprecipitated Hydroxyapatite for aquatic microorganism

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Hydroxyapatite (HA) nanoparticles ($Ca_{10}(PO_4)6(OH)_2$) can act as nanostructured fertilizers, which is a promising alternative for replacing conventional fertilizers, since it presents numerous advantages. However, the use of the nanomaterials as fertilizer also raise concerns about side effects caused by the accidental release in the environment, which can impact aquatic biota and consequently the human health. The present study aims to synthesize and characterize the physico-chemical properties of hydroxyapatite nanoparticles, and to evaluate its nanotoxicity for aquatic microorganisms, such as *Pseudokirchneriella subcapitata algae*, since microalgae form the base of the aquatic trophic chain. The synthesis of HA nanoparticles was carried out by coprecipitation method, which is simple, cheap and fast reaction pathway. Subsequently, the nanoparticles were characterized by scanning electron microscopy (SEM), X ray diffraction (XRD), zeta potential and isotherms adsorption / desorption of $N_2$ for structural and morphological characterization. Following the standard methodology proposed by OECD, 2011, we performed toxicity tests for microalgae to evaluate the inhibition of growth when exposed to the HA nanofertilizer. The results showed that the algal growth was inhibited for high concentrations of Coprecipitated HA samples, when compared with the control sample. In addition, changes in particle size, surface area, surface charge stability and formation of agglomerates/aggregates of the nanoparticles and their influences on algae toxicity are currently under investigation.

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