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Abstract

Metal and metal oxide nanoparticles (NPs) show differences in antimicrobial activity due to different chemical and physical properties. Using copper as a representative example, this study compared the NP effects on anaerobic ammonium oxidation (anammox) bacteria in wastewater treatment. Long-term exposure to 5-mgCu L^{-1} CuNPs reduced the physiological activity and abundance of anammox bacteria, thereby causing deterioration of reactor performance. However, anammox granules exhibited stronger resistance and resilience to perturbation by 1-160 mgCu-L^{-1} CuONPs, and no adverse effects on performance were observed. Moreover,