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Oxygen nanobubbles for water/sediment pollution remediation and ecological restoration

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Oxygen plays important roles in environmental and ecological processes. However, it is often difficult to deliver oxygen to the most needed domain for environmental remediation and ecological restoration such as deep-water dead zones and eutrophication. Interfacial nanobubbles may provide a promising solution for these purposes. Here, we will introduce a series of studies of using clay interfacial oxygen nanobubble to: 1) remediate hypoxia/anoxia in sediment and its effect in reducing phosphorus, nitrogen pollution from sediment [1, 2]; 2) reduction of arsenic toxicity in eutrophic waters [3]; 3) reduction of greenhouse gas emission in eutrophic waters [4]; 4) reduction of mercury toxicity in eutrophic waters [5]; 5) accelerating aquatic ecological restoration [6-7]. The chemical, physical, and microbial mechanisms of the above-mentioned treatments will be discussed based on our existing studies [8-10].

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