The Efficiency of Ferromagnetic Nanoparticles and Chlorella Algae in the Remediation of Oil Spills

Oil spills are a daunting threat and current forms of remediation are costly, inefficient, and toxic. A novel experiment using ferromagnetic nanoparticles and chlorella algae to remediate an oil spill was conducted. The oil spill was simulated in a petri dish with a 3:1, water to oil ratio. Ferromagnetic nanoparticles were placed in the petri dish, magnetizing the oil. Subsequently, a neodymium magnet was used to separate the oil from water. The water and oil separated completely, at a 100% efficiency rate. Chlorella algae were added to the mixture of oil, water, and nanoparticles. The mixture was placed in a lab environment for five days with an overhead light to ensure the survival and growth of the algae. Three trials were conducted for three different measurements of algae, with a constant measurement of ferromagnetic nanoparticles, adding up to nine trials plus the control. The highest amount of algae was successful in degrading the most oil and this method of remediating oil spills was deemed successful at this scale. The most effective trial degraded 71.6% of the oil. In order to determine the efficiency of this form of remediation, this method needs to be studied on a larger scale or in a controlled ocean environment. Though this research is still at an early stage, this method has strong potential to be the future of oil spill remediation.

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