

Big Problem, Tiny Solution; Is Nanotechnology the New Oil Spill Clean Up Solution?

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The purpose of this project is to test the effectiveness of a new experimental idea combining nanotechnology and magnetism to separate oil spills from water. Hypothesis: If an oil-based ferrofluid is added to an oil spill, then the mixture can be picked up by a strong magnet because the ferrofluid will disperse well in the oil and make it magnetic. The procedure consisted of testing the magnetic separation of oil using various amounts of ferrofluid (0 drops, 1 drop, and 5 drops). This method was also applied using different densities of oil while using a constant amount of ferrofluid (5 drops). The effect of water salinity and the effect of waves on the cleanup efficiency was also studied. The data suggested that my hypothesis was correct. The ferrofluid & oil mixture was picked up by the magnet and the clean up was more efficient with a higher concentration of ferrofluid. The process also worked better for the oils with lower densities. The efficiency of the clean up was higher on saline water. This method is definitely worth investigating on a larger scale considering that the nanoparticles can be recovered and reused, which can lower the cost of the clean-up operations.