University of Rhode Island

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Using Fe_2O_3@C Nanoparticles to Remove Oil from Oil-Water Mixture

ABSTRACT

In the last few decades, oil spills and organic pollutants have necessitated the development of efficient methods of clean-up procedures. The main obstacles in the clean-up procedure for such hazards are difficult selective separation, moderate thermal stability, and effective recyclability. A new method of fast and selective elimination of oils from water was reported with the use of core-shell Fe_2O_3@C nanoparticles. These nanoparticles are capable of extracting oil up to a maximum of 3.8 times the weight of the particles and repelling water molecules with its inherent highly hydrophobic and superoleophilic properties. Furthermore, the application of powerful magnetic fields enabled complete removal of these oil-saturated nanoparticles from the mixture. The reusability of these hydrophobic Fe_2O_3@C nanoparticles for several cycles makes this process even more noteworthy.