Recycling Hair: Investigating Flocculation as an Alternate Method of Assembling Hair Fibers for Oil Recovery

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Recycled hair fibers have been used previously for oil spill clean up as an alternative to non-organic sorbents, but the process of assembling these fibers is inefficient. Here, an alternative method of assembling fibers, flocculation, is investigated as a viable method of entangling fibers for oil absorption. This study reports the flocculation of hair fibers in water utilizing chaotic mixing as a means of entangling the fibers to form flocs. The parameters studied were the type of mixer, the concentration of hair in water, the length of fibers, and the mixing time. The capacity of a floc to absorb oil was quantified using crude oil and standard testing methods. Results showed that flocs made by mixing two lengths of hair obtained the highest oil absorption. Hair flocs produced under this condition were able to absorb four times their own weight of oil. On a large scale, this research will address the need for more eco-friendly and efficient methods for oil spill cleanup.

Awards Won:

Consortium for Ocean Leadership: First Award of $3,000