Enhancement of Phenanthrene Solubility by Synthetic- and Bio-Surfactants at Thermophilic Conditions. (S03-fang122819-Poster)

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Abstract:

Solubility of phenanthrene (PHE) in the presence of synthetic- and bio-surfactants was determined in a series of batch solution studies under thermophilic conditions. The purpose of surfactant addition was to enhance the bioavailability of PHE, which maybe correspondingly increase PHE mineralization. Tween 80, Triton X 100, and biosurfactants produced from isolate P-CG3 and Pseudomonas aeruginosa ATCC 9027 were used in this research. Although PHE solubility varied considerably in the presence of different surfactants, all four surfactants effectively enhanced the solubility of PHE. The solubility enhancement was observed to be proportional to the concentrations of surfactants at the supra-CMC concentrations. Biosurfactant from P-CG3 showed the highest effectiveness with a 28-fold increase in apparent solubility of PHE at a concentration of 10 x CMC compared to the control without surfactants. The different behavior of surfactants may be due to their difference in structure and the size of micelle formed at >= CMC.

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