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ABSTRACT

Experimental Measurement of Evaporation from an Oil Slick on the Open Sea

by

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A method has been developed, using gas chromotography, to measure the rate and extent of evaporation from floating oil slicks. By comparing chromatograms of fresh (unweathered) oil and oil which has been exposed to the marine environment, the weight fraction of oil evaporated can be determined. The analytical method was employed in a series of at-sea experiments in the Santa Barbara Channel using oil from one of the natural seeps near Coal Oil Point. Data from these experiments showed that, at a wind speed of about 6 m/sec, most of the evaporation occurred during the first one to two hours. The results also indicated that the oil slick residue may achieve a state of near neutral buoyancy, and thus may either sink or be transported within the water column. Comparison of the data with models proposed by Blokker and by Hoult showed that neither was able to predict the observed evaporation; agreement could be obtained, however, by empirically modifying a numerical constant on each model.