Oil Spill Residence Time in Brazilian Marine Environment – Laboratory Simulations
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Abstract
The oil versus oil correlation procedures have been largely applied in Brazil, by the Petrobras Research Center, in the assessment of oil spill source. Oil spill effects in marine environment depend on oil characteristics; local weather and the spill residence time. These effects can become more significant if oil slick reaches shoreline. It is known that population activities are concentrated in coastal areas. Environment impact evaluation includes several weathering processes, such as evaporation, photo-oxidation, biodegradation, emulsification, natural dispersion. Evaporation, especially in tropical environments, is the main process that affects crude oil spilled behavior (Fingas, 1998, 2001).

This research included a laboratory simulation of an oil spill in seawater. It were used light and heavy crude oils, whose were monitored over a period of 3 months. The progressive oil degradation was determined by whole oil gas chromatography and gas chromatography – mass spectrometry analyses (Wang and Fingas, 1997). The objective of this work was to identify degradation level versus residence time in laboratory simulation and to correlate oil and the pollution source, using biomarker compounds (Peters and Moldowan, 1993). The preliminary results for both oils showed that: a) Intense evaporation of light end n-alkanes was observed in the first week. b) Oil degradation was confirmed by the progressive decreasing of nC17/pristane and nC18/phytane ratios during the 90 days of the experiment, c) Terpanes, steranes and polycyclic aromatic hydrocarbons were evaluated every week.

Keywords: Oil degradation, residence time, biomarkers, oil spill simulations, marine environment, Brazil.

References