

## **Testing the efficiency of the oily water separator in removing polycyclic aromatic hydrocarbons from bilge water on the Training Ship State of Maine**

Oceangoing vessels accumulate bilge water, containing a variety of harmful substances, which is eventually discharged with the bilge water into the marine environment. Polycyclic aromatic hydrocarbons (PAHs) are toxic compounds found in oils often associated with bilge water due to bilge water's high oil content. Oily water separators (OWSs) are devices employed on vessels to reduce the concentration of oil discharged into the ocean. Unfortunately, these devices are not intended for the reduction or removal of other hazardous compounds. The objective of this study was to test the efficiency of the OWS in removing three PAHs commonly found in oil (naphthalene, phenanthrene, and pyrene) from bilge water on Maine Maritime Academy's Training Ship State of Maine. Analysis of the concentrations of these three PAHs in bilge water before and after treatment by the OWS was conducted by solid-phase microextraction (SPME) paired with gas chromatography mass spectrometry (GC-MS). The concentrations detected varied based on the specified PAH, but overall it was concluded that OWSs do not efficiently remove PAHs from bilge water before the water is discharged into the marine environment. This discharge, if left unregulated, could result dangerous implications to the marine environment and various organisms that inhabit it.

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