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REAL-TIME MONITORING OF AN URBAN RIVER CONTAMINATED WITH PETROLEUM PRODUCTS

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Abstract

Fluorescence spectroscopy is a promising approach to the characterization of natural aquatic components and organic pollutants, due to its rapid analysis and high sensitivity. Petroleum products had been studied, using fluorescence technique, in numerous occasions, as seawater and soil contaminant or as raw sample. Nevertheless, no complex assessment has been made on fluorescence real-time spectra of freshwater diesel oil contamination. This study reports a 5-days experiment on an urban river, where water samples were collected and measured automatically for fluorescence. Also, measurements of standard water quality parameters (pH, conductivity and total organic carbon) were performed. During the experiment, the river was accidentally polluted with diesel oil from containers disposed directly into the river. Fluorescence spectra presented 2 intense peaks with excitation wavelengths at 235 nm and 275 nm and emission wavelength at 340 nm. The data revealed that 2 and 3 aromatic rings hydrocarbons were dominant in the sample. Real-time measurements were compared with laboratory analyses performed on samples of diesel oil and gasoline. Based on this investigation, it has been evidenced that fluorescence spectroscopy is an effective tool in monitoring oil pollution in water systems, identifying the type of contaminant and estimating the quantity of the pollutant.

Key words: diesel oil pollution, dissolved organic matter, fluorescence spectroscopy, real-time monitoring, urban river

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