



Determination of dissolved organic matter removal efficiency in wastewater treatment works using fluorescence spectroscopy

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Fluorescence spectroscopy was used to investigate the removal efficiency of dissolved organic matter (DOM) in several wastewater treatment works, at different processing stages. The correlation between fluorescence values and biochemical oxygen demand (BOD), chemical oxygen demand (COD) and total organic carbon (TOC) has been examined. Fluorescence was measured for unfiltered and filtered (0.45 and 0.20 μm) samples of crude, settled and secondary treated wastewater (activated sludge), and final effluent. Moreover, the potential of using portable fluorimeters has been explored in a laboratory scale activated sludge process. Good correlations were observed for filtered and unfiltered wastewater samples between protein-like fluorescence intensity (excitation 280 nm, emission 350 nm) and BOD ($r = 0.78$), COD ($r = 0.90$) and TOC ($r = 0.79$). BOD displayed a higher correlation at the 0.20 μm filtered samples compared to COD and TOC. Slightly better relation was seen between fluorescence and conventional parameters at the portable fluorimeters compared to laboratory-based instruments. The results indicated that fluorescence spectroscopy, in particular protein-like fluorescence, could be used for continuous, real-time assessment of DOM removal efficiency in wastewater treatment works.