



Configuration of a fluorimeter with enhanced capacity for acquiring and analyzing excitation-emission maps of dissolved (chromophoric) organic carbon.

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Fluorimetric data, in the form of excitation-emission matrices (EEMs), is becoming one of the key tools for the analysis of the content and composition of water samples containing dissolved organic carbon and related chromophores. This study reports the comparative results of EEM measurements performed with a fluorimeter using a conventional ozone-free light source, scanning single-grating excitation and emission monochromators and a single-channel photomultiplier tube detector to those obtained with a fluorimeter exhibiting a special configuration for the application. We report on the potential for increased sensitivity relative to the following features: 1) using a UV-enhanced xenon light source for excitation, 2) using an open electrode CCD with imaging spectrograph and appropriate emission grating for rapid robust spectral acquisition, 3) using a transmission accessory to simultaneously measure and correct for inner filter effects, and 4) using a suite of analysis software tools in a special interface designed to facilitate full instrument correction, background subtraction and PARAFAC analysis among other options. Performance specifications are evaluated for both quantitative and qualitative fluorescence standards and real-world samples from a range of sources.