

Methods for the Collection and Measurement of the Spectral Absorption Coefficient ($a_g\lambda$) of Chromophoric Dissolved Organic Matter (CDOM)

Seawater samples for the measurement of chromophoric dissolved organic matter (CDOM) absorption (a_g) are filtered under a gentle vacuum (<5 in Hg) through pre-combusted (6 hours at 450°C) Whatman GF/F glass fiber filters and collected directly into pre-cleaned and pre-combusted sample glass bottles. Samples for determination of CDOM spectral absorption coefficients are stored under refrigeration at 4°C. In the laboratory, CDOM samples are warmed to room temperature and filtered through 0.2 μm Whatman Nuclepore polycarbonate filters or Gelman Supor (polyethersulfone) filters prior to analysis (Mitchell et al. 2000). Filtration samples through GF/F filters is necessary for coastal ocean waters due to the high particle load that quickly clog Nuclepore and Supor filters. Absorption spectra of CDOM are measured using a multiple pathlength, liquid core waveguide (MPLCW) system (World Precision Instruments, Inc., Sarasota, FL) with UV oxidized Milli-Q water as a reference (Miller et al., 2002). CDOM absorbance spectra are measured between 370 and 725 nm at 1 nm intervals normalized to the reference spectrum. For seawater samples, an absorbance correction to account for the different refractive indices of Milli-Q water and seawater is applied. The correction is based on previously measured solutions of known salinity devoid of CDOM. The corresponding spectral absorbance correction for a given salinity is subtracted from the observed spectrum of a sample of the same salinity.

The spectral absorption coefficients, $a_g(\lambda)$ (m^{-1}) are obtained by

$$a_g(\lambda) = 2.303A(\lambda) / L,$$

where $A(\lambda)$ is the absorbance at wavelength λ and L is the pathlength in meters. Absorption data are also corrected for baseline offsets by subtracting the average absorption value between 690-700nm.

Miller, R. L., M. Belz, C. D. Castillo, and R. Trzaska. 2002. Determining CDOM absorption spectra in diverse coastal environments using a multiple pathlength, liquid core waveguide system. *Continental Shelf Research* 22: 1301-1310.