

Application Note

CDOM Monitoring Using a Handheld Fluorometer

Background:

Colored dissolved organic matter (CDOM) is the optically measurable component of the dissolved organic matter in water. Also known as chromophoric dissolved organic matter, *yellow substance*, and *gelbstoff*, CDOM occurs naturally in aquatic environments primarily as a result of tannins released from decaying detritus. CDOM most strongly absorbs short wavelength light ranging from blue to ultraviolet, whereas pure water absorbs longer wavelength red light. As non-turbid water with little or no CDOM appears blue, the color of water will range through green, yellow-green, and brown as CDOM increases. CDOM can have a significant effect on biological activity in aquatic systems. CDOM diminishes light as it penetrates water. This has a limiting effect on photosynthesis and can inhibit the growth of phytoplankton populations, which form the basis of oceanic food chains and are a primary source of atmospheric oxygen.

Fluorescence Detection:

CDOM is typically measured using absorbance or fluorescence. Absorbance is a measure of how much light of a specific wavelength (typically 254 nm or 440 nm) is absorbed over a given distance. Fluorescence is a process where a substance emits long wavelength light when exposed to short wavelength light. CDOM sensors use fluorescence to characterize CDOM in situ, which can be calibrated to estimate absorption coefficients.

Amisience's handheld fluorometer (**FQ-360/460-A**) uses 360nm as excitation source and detect the CDOM fluorescence in the 460nm range. Due to its high portability and low cost, it can be used anywhere in the field to conduct environmental study of natural water resources.

