Instrument Report

Instrument Details:
Name: Perkin Elmer Lambda 18 UV/Vis spectrometer
Model: Lambda 18
S/N: 75109
Installation date: 11 September 1996

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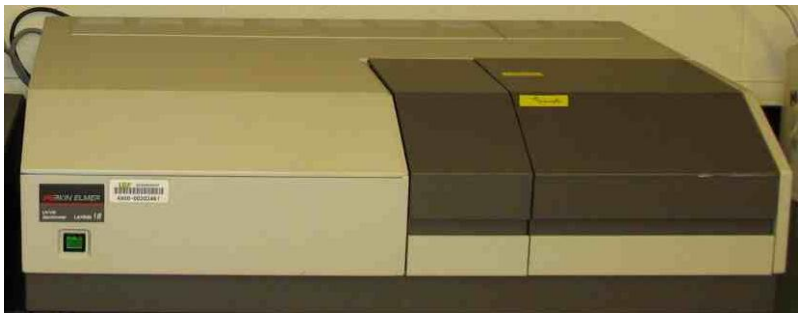
I) Introduction

The Lambda 18 is a double beam UV/Vis spectrophotometer from Perkin Elmer, packing pre-aligned tungsten and deuterium lamps. It has a wavelength range of 185-900nm with a fixed bandwidth of 1 nm and wavelength accuracy of ±0.15nm. The photometric accuracy is ±0.002 AU at 0.5AU which translates to ±0.046 m^{-1} when using a 10cm pathlength cell.



II) Calibration/Maintenance

Wavelength accuracy for this instrument has been checked intermittently using a Holmium Oxide filter on a near-annual basis.

III) Sample collection

Gelbstoff absorption spectra, $a_g(\lambda)$, was measured on filtered seawater samples collected at sea. Seawater was first filtered through GF/F filters (nominal pore size = 0.7μm) to remove larger particles that tend to clog smaller pore size filters. These GF/F filtrates were then filtered through pre-rinsed 0.2μm nylon membrane filters. Samples were stored in clean 4oz amber borosilicate bottles and refrigerated when samples were processed within a week of collection or frozen if longer storage times were required.

IV) Data processing

Samples were allowed to warm up slowly to room temperature prior to being scanned. Duplicate scans of gelbstoff absorbance spectra, Ag(λ), were measured from 200-800nm using 10cm quartz cells with Milli Q water as a reference. Raw individual scans were smoothed (7-point boxcar average) and averaged prior to being converted to $a_g(\lambda)$ as follows

$$a_g(\lambda) = \frac{2.3\ A_g(\lambda)}{l}$$

where l is the cell pathlength. The average absorption from 690-710nm was then subtracted from the entire spectra to correct for residual scattering.

Reporting Notation:
abs_ag = absorbance coefficient (raw duplicate scans smoothed and averaged)
ag = absorption coefficient (null point corrected)