The bbe AlgaeOnlineAnalyser

Chlorophyll, algae class and photosynthetic activity - continuous determination in real time

The bbe AlgaeOnlineAnalyser continuously measures the chlorophyll fluorescence of micro algae in real time. The measurement corresponds to wet-chemical chlorophyll analysis (DIN/ISO).
In contrast to time-consuming sample preparations and counting, the fluorometric assay provides rapid determination of the chlorophyll content in its natural environment. The AlgaeOnlineAnalyser is adapted to HPLC-pigment analysis.

The bbe software for algae class determination identifies the distribution of algae classes relating to the total 'chlorophyll-a' content. With this technique, the 'chlorophyll-a' content of green algae, blue-green algae, cryptophyceae and brown algae (i.e. diatoms, dinoflagellates) is analysed. The system is adaptable to new (customised) algae classes added to the measuring system.

Different patterns of fluorescence excitation reflect the photosynthetic efficiency of the algae. The fluorescence

AlgaeOnlineAnalyser with sensor (left), sample pump (left), IP 54 housing, industrial PC, touch pad (front right) and USB slot for memory stick

signals f_0, f, f_m are used to calculate the Genty parameter as the most accepted measure for algae activity. The activity is closely related to oxygen evolution.

To compensate for the influence of turbidity on the fluorescence, transmission measurement is used as a tool for correction.
The measurement of yellow substances (CDOM) accounts for an additional source of fluorescence. The automatised correction improves chlorophyll determination especially at low concentrations.

Measuring station in Hamburg

Environments

- lakes
- reservoirs
- rivers
- estuaries
- oceans
- wetlands

Applications

- regulatory control
- environmental monitoring
- limnological work
- research
- education
- supervision of aquaculture

Operation

Easy operation with intuitive user guide. **Measurement~Start** enacts the external pump which pumps an algae sample into the measuring chamber. Following a dark adaption, pulsed light from the spectrofluorometer excites the algae pigments. Fluorescence signals are collected by a sensitive photomultiplier and used for the calculation of algae classes. Normspectra with individual fingerprints for each algae class provide optimised evaluation of the results. Optionally, the photosynthetic activity of the algae is determined. All relevant data are recorded on the HD and shown on the graphic LCD display.

After draining, an automatic cleaning device periodically cleans the measuring cell and removes any particles or biofilms. This procedure guarantees the well-defined optical properties of the cell and extends the maintenance-free period.

Combined with a modem and pcAnywhere software, the Algae Online Analyser enables remote access for instrument control/data transfer.
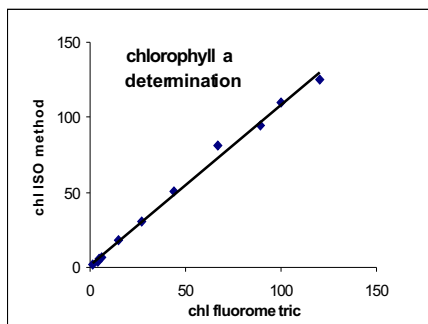
Comparison of Chlorophyll-a concentration [µg/L] performed with wet-chemical approach (ISO) and fluorometric *in vivo* assay

The **AlgaeOnlineAnalyser** - a well-established instrument in monitoring stations - is used in many countries. Please ask for references.
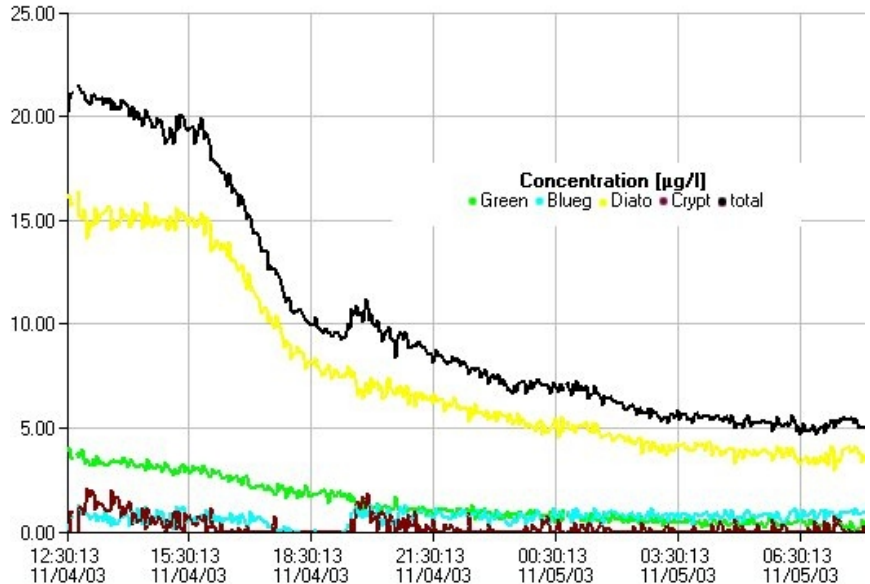
Time course of algae class determination with the AlgaeOnlineAnalyser at PalDang river (S. Korea), 2003

Technical data

Measuring range	0 - 200 µg chl-a/l
Resolution chl determination	0.1 µg chl-a/l
Resolution Genty parameter	3 µg chl-a/l
Weight of complete equipment	19 kg
Size (H x W x D)	420 x 600 x 200 mm^3
Power supply	230 V / 50 Hz or 110 V / 60 Hz
Power input	100 W
Sample temperature	0 - 30° C
Sample volume	30 ml
Housing protection class	IP54
Interfaces/outputs	RS232, LAN (PC versions), up to 16 x 4-20 mA (analogue)
Maintenance interval	> 14 days

Equipment

AOA Model	Algae differentiation	Activity	Industrial PC	IP 54 housing
BG82000	+	+	+	+
BG83000	+	-	+	+
BG80000*	+	+	-	+
BG81000*	+	-	-	+
BG84000*	+	+	-	-
BG85000*	+	-	-	-

*for operation and calculation, an external PC with Win 95, 98, 2000 or XP is required