Alarm Evaluation of the bbe Algae Toximeter in The Netherlands

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Kiel, 1-3 July, 2008
Introduction

- Principle
- Performance Characteristics
- Case Study - May-June 2006 in River Meuse: Diuron
- Case Study - Sept. 2006 in River Meuse: Terbutryn
- Sensitivity
Excitation of chlorophyll-a molecules

Normally 2 % of energy is emitted as fluorescence

Disturbance of photosynthesis process leads to increased fluorescence
Performance Characteristics

- Based on the ISO for online sensors
- Essential for the acceptance of biological monitoring systems

Reference number of working document: ISO/TC 147/WG 2 N 29
Date: 2001-07-25
Reference number of document: ISO/DIS 15839
Committee identification: ISO/TC 147/WG 2
Secretariat: AFNOR

Water Quality – On-line Sensors/Analysing Equipment for Water – Specifications and Performance Tests

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### Performance Characteristics

Standard based on:
- Laboratory tests
- Field tests

<table>
<thead>
<tr>
<th>Performance Characteristic</th>
<th>Unit</th>
<th>Result according to ISO 15839</th>
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<td>Response time, Response time</td>
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<td>Delay time, Delay time</td>
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<td>Rise time, Fall time</td>
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<td>Linearity (tested range)</td>
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<td>Coefficient of variation</td>
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<td>Limit of quantification (LOQ)</td>
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<td>Repeatability</td>
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<td>Lowest detectable change (LDC)</td>
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<td>Trueness</td>
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<td>Short term drift</td>
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<td>Day-to-day repeatability</td>
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<td>Memory effect</td>
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<td>Interference caused by: interferent 2</td>
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<td>Environmental conditions (lower/upper) 2</td>
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<td>Trueness based on (relative/absolute) differences</td>
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<td>Long term drift</td>
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<td>Availability, Up-time</td>
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Performance Characteristics: Matrix Effects
Diuron in River Meuse

- **Persistent herbicide:**
  \[t_{\frac{1}{2}} = 4 \text{ months}\]

- **Peaks - May 2006:**
  - Eijsden: max. 1.03 µg/L; 2.5 days
  - Keijzersveer: max. 0.23 µg/L; 7 days

- **June:** max. 0.88 µg/L in Eijsden
Diuron in May-June 2006
Alarm Event on 24\textsuperscript{th} September, 2006
Alarm Event on 24\textsuperscript{th} September, 2006

![Graph showing inhibition of terbutrynn vs concentration](image)
Alarm Event on 24th September, 2006

Inhibition (%) vs. terbutryn diuron (µg.L⁻¹)
Standardised Sensitivity
Comparison of Different Herbicides

- PS II
- PS I

Amino acid synthesis

Inhibition threshold
- diuron
- glyphosate
- simazine
- atrazine
- terbutryn

Inhibition (%)

Dose (µg.L⁻¹)
Thank you for your attention

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