

Diploma Work:

Optical sensor system for detection of micro-pollutants in water

Background

Optical monitoring techniques offer a unique possibility for on-line real-time monitoring of contaminants in water. They are non-intrusive, rapid and reagent-less. The illumination of biological substances with UV radiation causes them to emit a fluorescence signature, which can be used for detection and analysis. This is a technique commonly used in biochemical and medical research fields, and has also been reported in investigations of water purity.

Predect AB wishes to complement its existing product for on-line detection of contaminants in water with a technique that determines whether the contaminant is alive or dead. Fluorescence spectrometry is a strong candidate for this.

The goal of this diploma project is verification of the fluorescence spectroscopy technique for detection and first identification of typical water contaminants. A bench-top prototype fluorescence spectrometer system will be constructed, and the feasibility of detecting critical bacteria at varying concentrations will be experimentally investigated by the measurement of their fluorescence spectra.

Tasks

The work will involve the following tasks, with especial emphasis on the middle three -

- Literature study, in order to get a feel for the technology involved.
- Construction of fluorescence spectrometer (bench-top prototype) and functional tests.
- Measurement and analysis of fluorescence spectra from supplied samples, as a function of excitation wavelength.
- Literature survey of on-going research activities world-wide for the detection of bacteria and parasites in water.
- Written report

Time plan and location

The work is planned to last 20 weeks, starting May 2010, and is located at Acreo, Kista.

Required background

Knowledge and practical experience of optical measurement techniques.

Contact

Susan Savage, susan.savage@acreo.se, tel: 08-632-7808

Bertrand Noharet, bertrand.noharet@acreo.se, tel: 08-632 7738