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Seminar Abstract:

Chemical sensors for water analysis

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There is a broad range of sensors available for automated and continuous monitoring of aquatic systems. Chemical and physical sensors can be combined and are often integrated in a common platform. Recent advances in flow cytometry even allow the integration of unattended microbial monitoring without complex cultivation or genetic analyses. The introduction to this seminar will provide a short overview of available sensor systems and how they can be integrated. The main part will document several new types of low-cost



Disposable ion-selective membrane sensors (center), oxygen microsensor (left) and reference electrode (right) for in-situ measurements in soft sediments (Martin Maerki).

sensor systems for chemical analysis. Recent advances in solid-contact electrodes offer the potential of improved detection limits, of drift-free measurements and multiple measurements with the same sensor.

Similarly, optode sensors have been optimized for fast response times and low detection limits. Due to their long-term stability these devices are now the method of choice for dissolved oxygen measurements. The final part of the seminar will illustrate different applications in freshwaters, sediments and sewage systems in order to document the advantages and limitations of in-situ sensor systems for aquatic analyses.

Maerki M., Mueller B., Dinkel C., Wehrli B. 2009. Mineralization pathways in lake sediments with different oxygen and organic carbon supply. *Limnology and Oceanography* 54, 428-438.

Crespo G.A., Afshar M.G., Bakker E. 2012. Direct detection of acidity, alkalinity and pH with membrane electrodes. *Anal. Chem.* 84, 10165-10169.