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A new concept for a proficiency testing scheme for on-site measurements in water analysis

Introduction

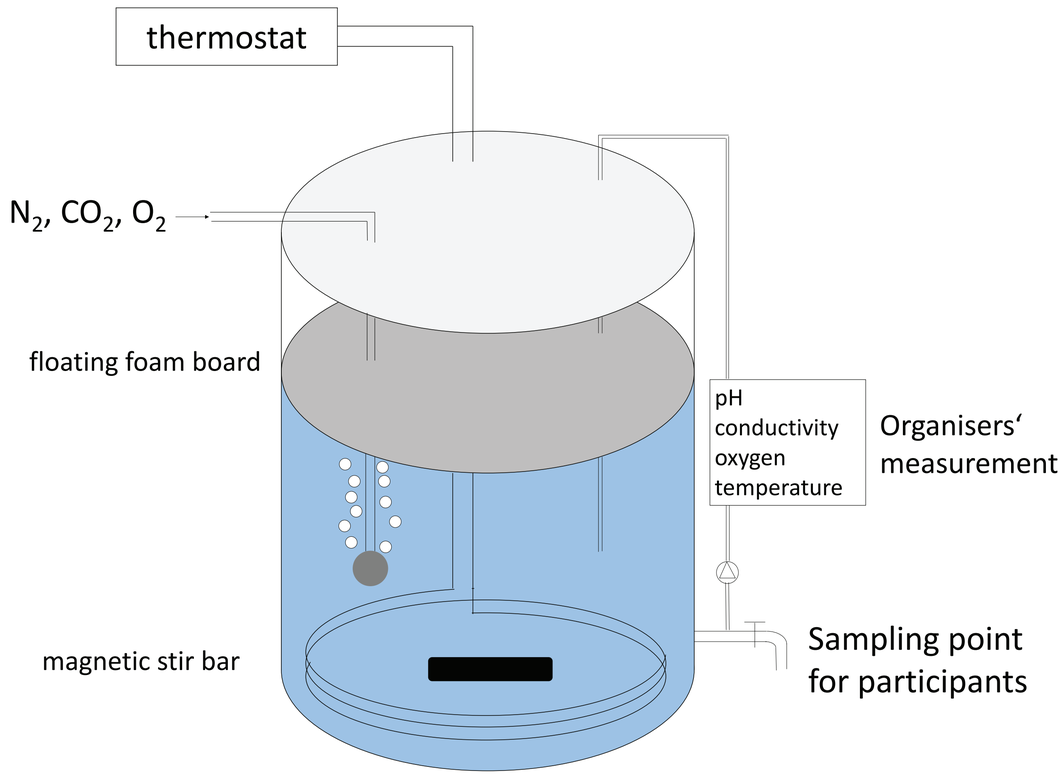
In water analysis, a few important parameters need to be analysed on-site, because sufficient sample stabilisation is not possible to allow for a transport into the laboratory. These parameters include:

- temperature
- electrical conductivity
- pH value
- oxygen concentration
- oxidation-reduction potential (ORP)

Accuracy of measurements with limited resources in the field is expected to be significantly lower than measurements in the laboratory

Basic concept

Since dispatch of stable samples is not possible and measurement under field condition is aimed at, participants are required to come to the organiser's laboratory, taking a sample from a container and measuring the parameters on-site. Different levels of the measurands are obtained by gassing the vessel with N_2, CO_2 and O_2. For ORP redox buffer systems were planned.



Conclusions

By gassing special containers with a gas mixture of different compositions, it has been possible to produce samples that are sufficiently stable over a long period of time in terms of oxygen content, pH and electrical conductivity to serve as PT items.

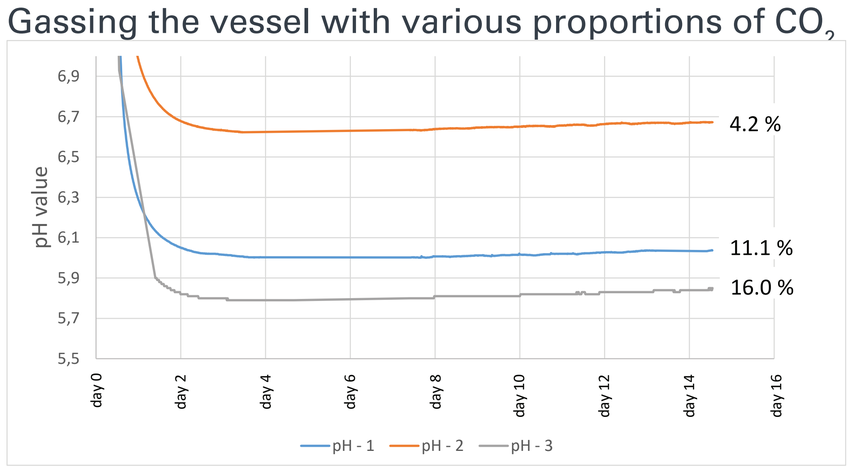
Attempts have been made to keep the redox potential constant as well via redox buffers; unfortunately without success so far.

Outlook

A first PT on the onsite parameters in water analysis is planned for early 2024.
In the meantime other approaches for a constant redox potential will be investigated.

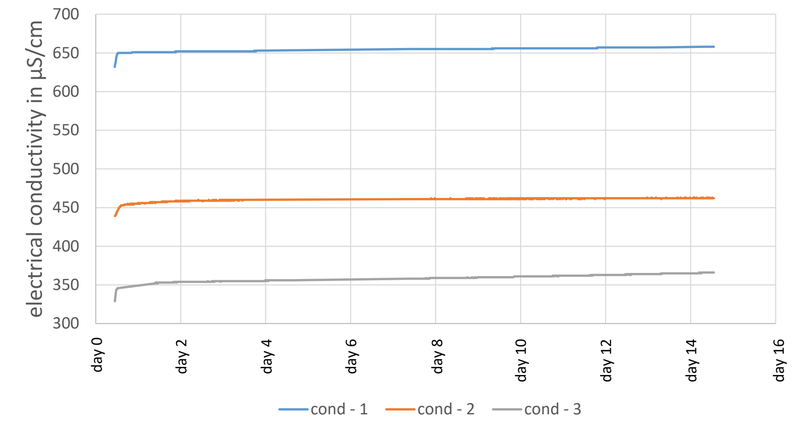
pH value

Gassing the vessel with various proportions of CO_2



Electrical conductivity

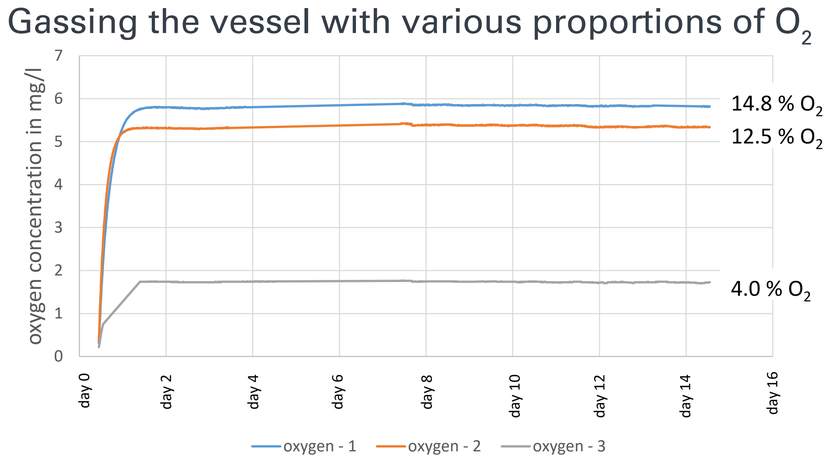
Addition of various amounts of NaCl



The slight increase over time is probably due to the bleeding of the pH electrode

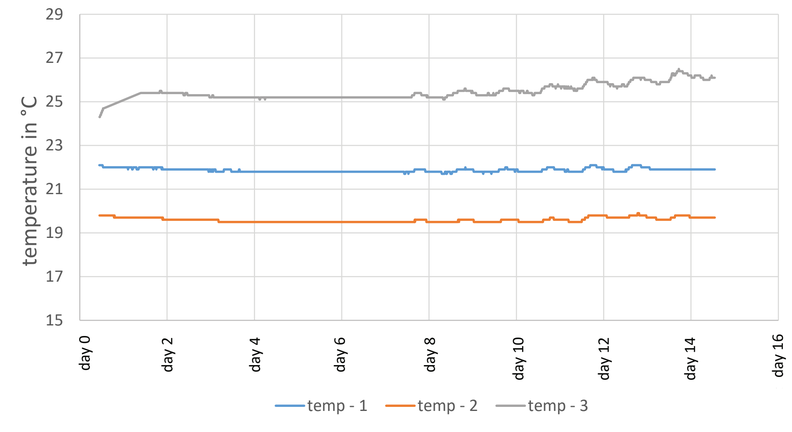
Oxygen concentration

Gassing the vessel with various proportions of O_2



Temperature

Use of different thermostats



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