ecoTech Umwelt-Meßsysteme

Redox electrode

according to Mansfeldt

Application

Measurement of the Redox potential (E_H) in soil; field and laboratory implementation is possible.

Principles of operation

This execution of a redox electrode was developed by Prof. Dr. Mansfeldt, University of Cologne, and was optimized by ecoTech in cooperation with the Bavarian Environmental Protection Agency. It was designed for continuous operation in soils even under water-saturated conditions. Due to its small dimensions it is appropriate for the laboratory use, too (in soil columns or pot experiments).
The redox potential of a soil may alter very strongly on the millimeter scale, and very small soil regions that are in contact with the platinum rod can dominate the measuring value of the electrode. Therefore, redox potentials should be measured with small, normalized platinum surfaces. For that reason ecoTech's new redox electrode has got a platinum rod with a diameter of only 1 mm and a length of only 5 mm. As reference electrode an Ag/AgCl-electrode is used, which has got electrical contact to the Pt electrode by means of a salt bridge. Measurements can be made either with high-class voltmeters or with suitable data loggers (high input resistance is needed).

Redox electrode with S7 laboratory plug

Data logger unit for 18 redox electrodes, temperature sensors and many others

Technical data

• Signal	mV
• Platinum rod	
Material	99,95 % Pt, hard drawn out
Diameter	1 mm
Length	5 mm
• Shaft	
Material	Carbon fiber
Diameter	6 mm

Execution — Ord. No.

• Shaft length 30 cm	461/30
Shaft length 60 cm	461/60
etc.	

Options and accessories

• Salt bridge with Ag/AgCl reference for field installation	4621
• Salt bridge with Ag/AgCl reference for lab installation	4622
• Data logger for long-term usage	22011
• Data logger connection module for redox electrodes	4611

Literature:
Mansfeldt, T. (2003): In situ long-term redox potential measurements in a dyked marsh soil; J. Plant Nutr. Soil Sci., 166, 210-219.
Mansfeldt, T. (2004): Redox potential of bulk soil and soil solution concentration of nitrate, manganese, iron, and sulfate in two Gleysols; J. Plant Nutr. Soil Sci., 167, 7-16.
Weigand H., T. Mansfeldt, S. Wessel-Bothe & C. Marb (2005): Bulk soil redox potential and arsenic speciation in the pore water of fen soils; in W. Skierucha & R.T. Walcak (eds.): Monitoring and modelling the properties of soil as a porous medium: the role of soil use; International conference, Lublin; 44-46.