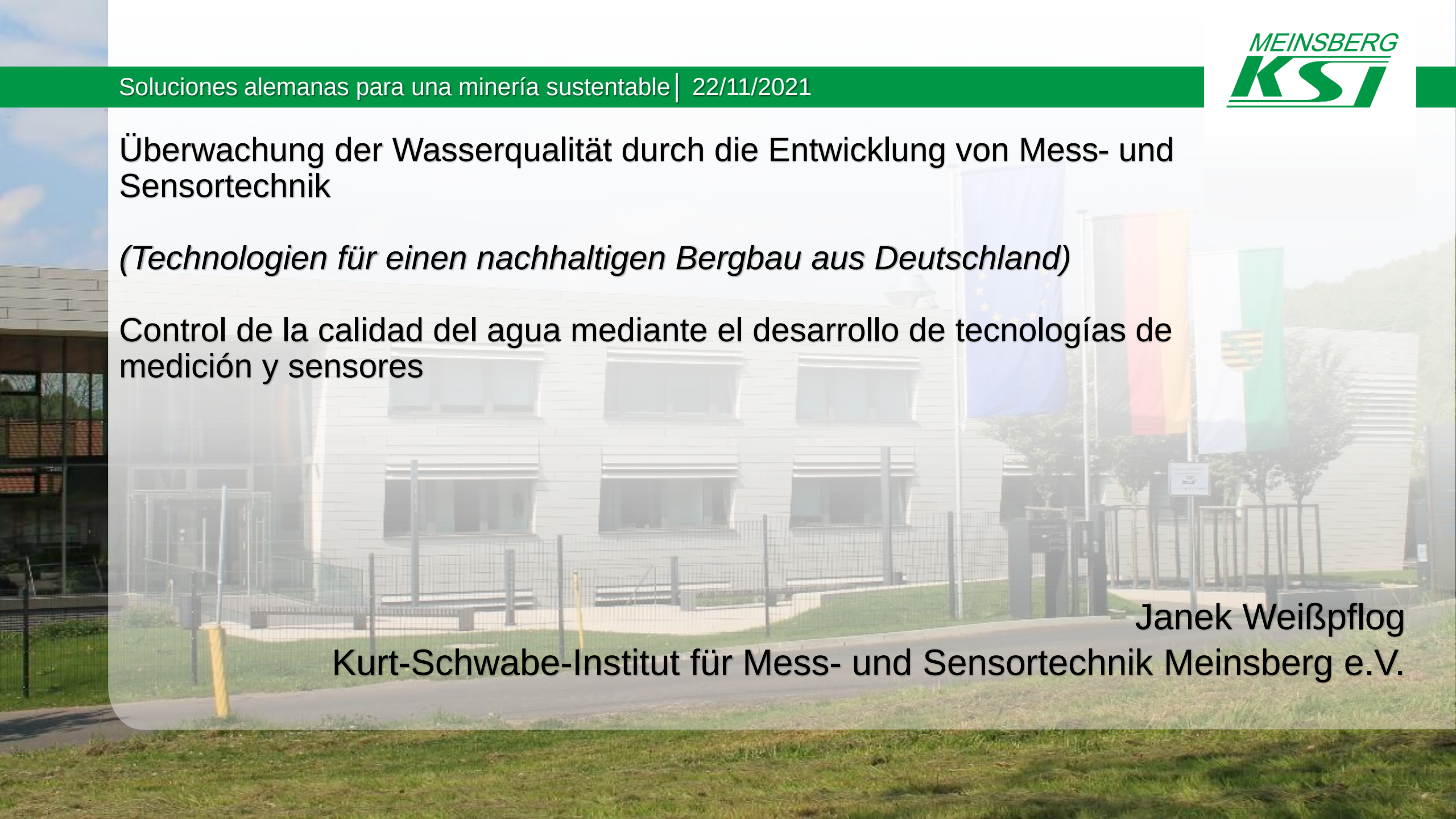


Überwachung der Wasserqualität durch die Entwicklung von Mess- und Sensortechnik

(Technologien für einen nachhaltigen Bergbau aus Deutschland)

Control de la calidad del agua mediante el desarrollo de tecnologías de medición y sensores

The background image shows a modern, multi-story building with a light-colored facade and large windows. In front of the building, there are several flags on tall poles, including the European Union flag, the German flag, and a green flag with a white cross. A paved path leads towards the building, and there is a grassy area in the foreground.

Janek Weißpflog
Kurt-Schwabe-Institut für Mess- und Sensortechnik Meinsberg e.V.

Kurt-Schwabe-Institut für Mess- und Sensortechnik Meinsberg e.V.

■ Status:

- Non-profit
- University-oriented
- Application-oriented

■ Head of the Institute:

- Prof. Dr. M. Mertig



Prof. Michael Mertig
michael.mertig@ksi-meinsberg.de

■ Number of staff:

- 40

■ 3 pillars of sensor research at the Institute

- Electrochemical sensor technology
- High-temperature gas sensors
- Biological-physical sensor technology



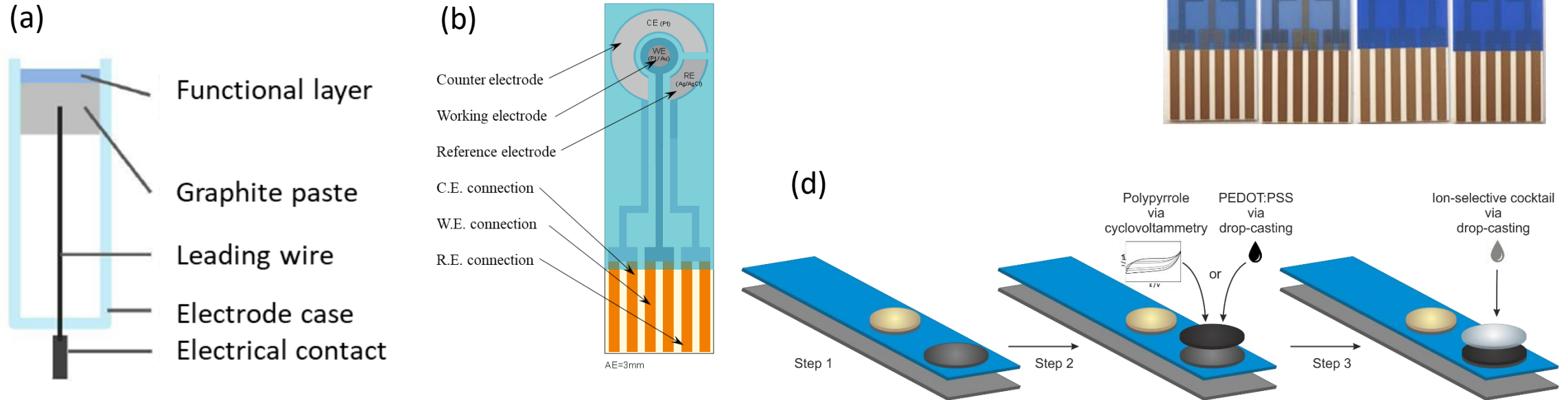
Germany

Kurt-Schwabe-Institut für Mess- und Sensortechnik Meinsberg e.V.

- Over 70 years of experience in applied sensor research
- Development of miniaturized sensors and sensor systems mainly for decentralized, on-site applications
- Electrochemical *all-solid-state* sensors for mobile environmental monitoring inclusive analysis of water quality (e.g. detection of contamination with heavy metals such as As(III), Cd(II) or Pb(II), agricultural remnants like nitrates and pesticides as well as drug residues as Diclofenac)
- Monitoring of water and soil quality, waste water treatment
- Hydrogen sensors (Metal oxide gas sensors, gas chromatography, mass spectrometry) → detection of H_2

Development of electrochemical *all-solid-state* electrodes

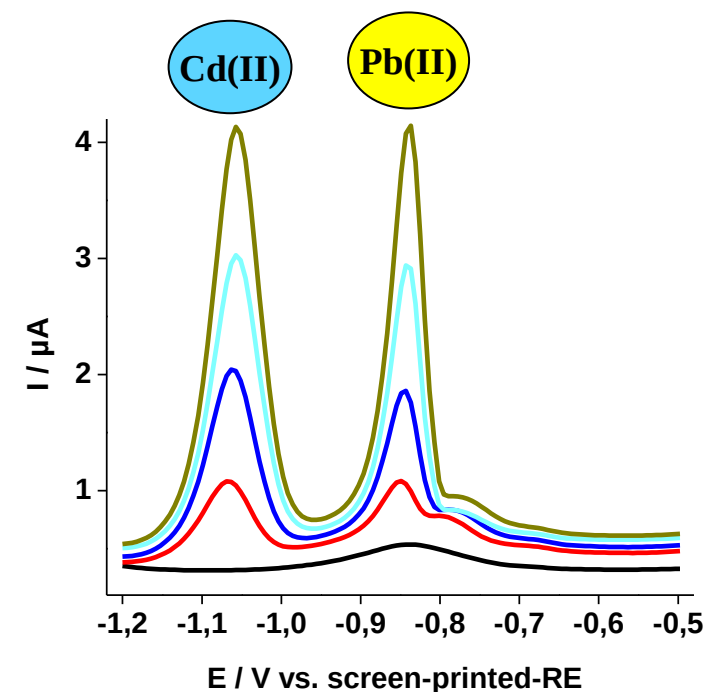
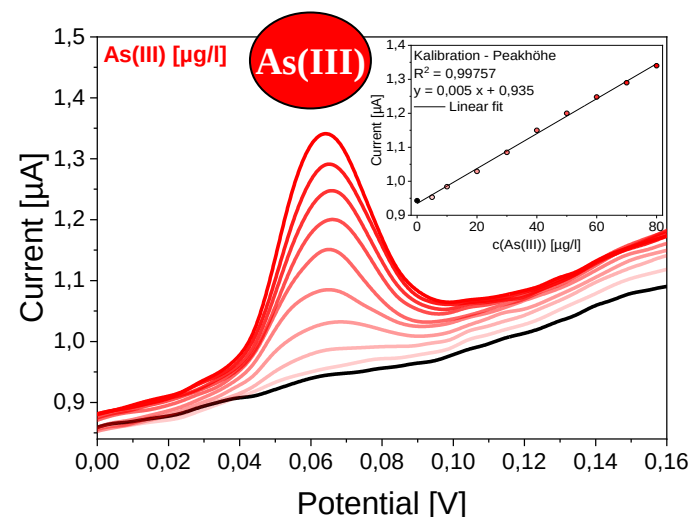
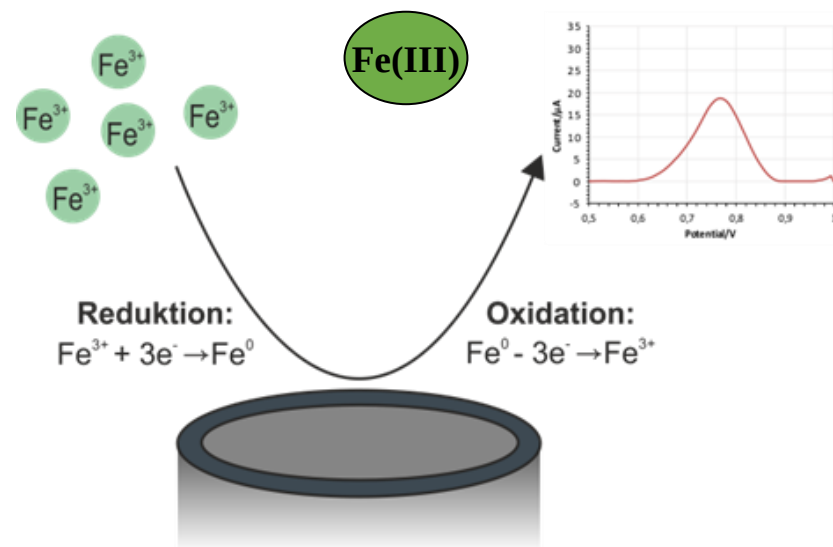
- Development of low-cost, portable, nanotechnology-based electrochemical sensors for water quality monitoring and for environmental applications
- Substances of high interest: heavy metals, pesticides, pharmaceuticals



(a) Schematic structure of a rod electrode, (b) a planar screen printing electrode (SPE), (c) examples of SPE and (d) preparation of SPE.

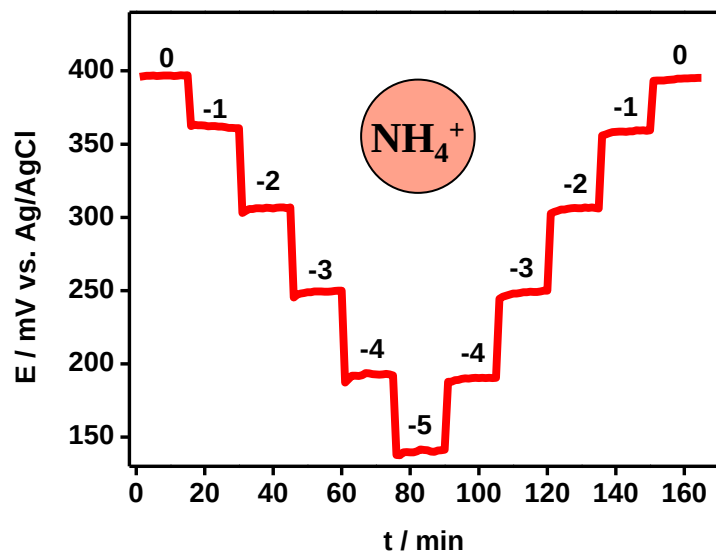
Electrochemical detection of contaminations

- Mobile water quality monitoring system → detection of **Cd(II)**, **Pb(II)**, **Cr(III)**, **Cr(VI)**
- Biopolymer-based sensor-actuator systems for the detection and flocculation of pollutants in ochred surface waters → detection of **Fe(III)**, **SO₄²⁻**
- Development and testing of an *in-situ* sensor system for **As(III)/As(V)** detection
- Miniaturized monitoring sensor systems for plants and agriculture → detection of **NO₃⁻**

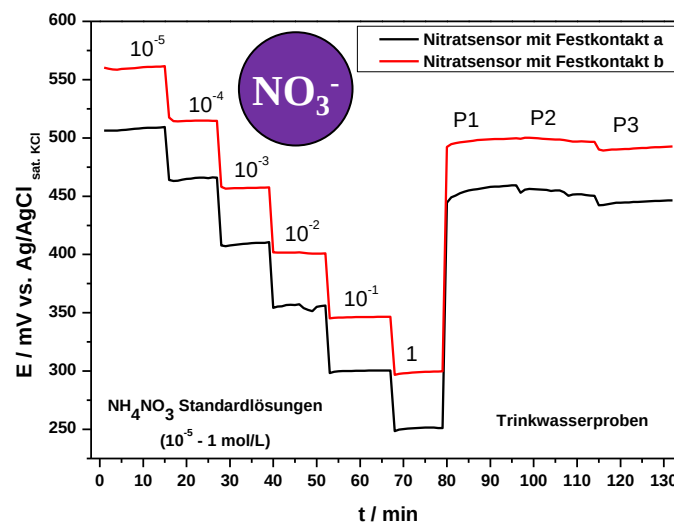


Agriculture based sensors

- Fast response
- Reproducible results



Response behavior of a novel polymer-modified NH_4^+ -selective all-solid-state electrode.



NO_3^- -Potentiometric determination in aqueous samples.



Impedance sensor for the determination of leachate / Moisture content.

Thank you for your attention!

R&D collaborations in the presented topics

Janek Weißpflog

Kurt-Schwabe-Institut für Mess- und Sensortechnik Meinsberg e.V.

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www.ksi-meinsberg.de

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Das Kurt-Schwabe-Institut für Mess- und Sensortechnik Meinsberg e.V. wird mitfinanziert durch Steuermittel auf der Grundlage des vom Sächsischen Landtag beschlossenen Haushaltes.