

# LOW-COST ELECTROCHEMICAL SENSOR BOX TO DETECT ORGANIC MICROPOLLUTANTS

## UNIVERSITÉ D'ANGERS



University of Angers introduces a monitoring electrochemical sensor box enabling low-cost, near-real-time quantitative assessment of non-degradable and persistent chemicals such as pharmaceuticals, nitrites, plastic additives and Perfluoroalkyl substances (PFAS) in sweet water.

Unlike other solutions on the market, UA's sensor implements electrodes modified with molecularly imprinted polymers (MIPs) and gold nanoparticles to achieve higher selectivity and sensitivity to organic micropollutants. Combined with the on-site measurement capability and option to detect multiple contaminants simultaneously, the sensor is a steppingstone in the Common Implementation Strategy (CIS) of the Water Framework Directive (WFD) towards improved water quality surveillance and decision-making.

The wide applicability of the sensor has been proven during the iMERMAID's use case implementations at diverse wastewater treatment plants. The sensors demonstrated sensibility and selectivity far beyond limits required by national laws.



Figure 2: On-site analysis using single channel mode

In the long term, the monitoring box can be implemented by environmental authorities for early detection of organic micropollutants in wastewater treatment plants to comply with the revised urban wastewater treatment directive, by municipal or regional water utilities and researchers to perform rapid on-site screening supplementary to accredited lab analyses and by industrial operators to continuously monitor pharmaceutical effluents and landfill leachates. Rapid on-site monitoring supports fast mitigation of pollution events very close to the source and may potentially prevent them altogether. Importantly, low-cost monitoring sensors help determine the remediation processes efficiencies.

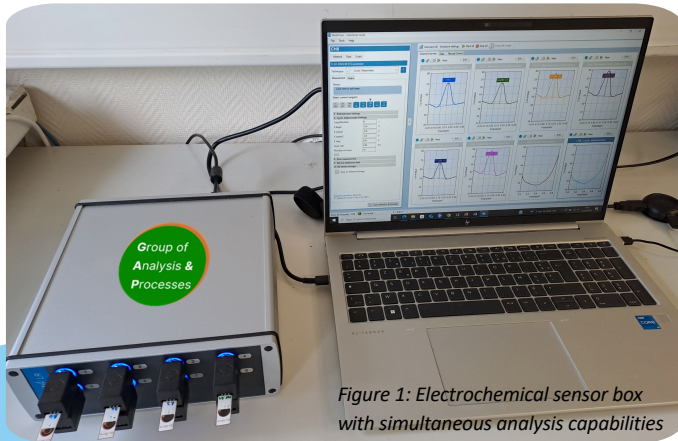


Figure 1: Electrochemical sensor box with simultaneous analysis capabilities

### Key Benefits



**Sensitive:** High sensitivity to persistent chemicals (e.g. pharmaceuticals, pesticides, PFAS)



**Affordable:** Low-cost electrodes enable widespread and frequent use



**Simultaneous analysis:** Multichannel system to monitor multiple contaminant compounds



**Portable and rapid:** Rapide response time (<2min), and on-site monitoring

