

Anti-biofouling in Oceanographic Monitoring with ANB Sensors' Calibration-Free pH Sensors



OVERVIEW

The measurement of pH in the ocean is extremely important and indispensable in providing an understanding of the ocean's health. Biofouling has long been considered a limiting factor for oceanographic studies and has been recognized as one of the main obstacles to autonomous environmental monitoring in coastal and ocean environments, as the rapid covering of bio growth on sensors disrupts the long-term quality of the measurements.

USE CASE

The pH sensor was deployed in the OBSEA platform in the Mediterranean Sea, which is recognised as a hot spot for climatic changes with significant seasonal variation in weather and biodiversity, making biofouling prevalent. These tests were done in collaboration with Universitat Politècnica de Catalunya.

Two sensors were deployed for 6 weeks on the coastal observing station at 20m depth. One sensor was set up to scan every 15 minutes, the other sensor was left not scanning. The results obtained were outstanding, as, after 6 weeks deployment, the transducer (the active sensing part) of the scanning sensor showed no evidence of biofouling, whereas the dormant sensor was completely covered in biogrowth.

The electrochemical method utilized to run the sensor produces a low concentration of hydrogen peroxide (H_2O_2) which inhibits the formation of bacterial biofilm on the sensing element. This low concentration of hydrogen peroxide generated local to the surface of the sensor is soon diluted and broken down so as to be non-hazardous to the external environment, but extremely effective for biofouling purposes.

AT A GLANCE

- **Extended Deployment Durability:** Our sensor's built-in anti-biofouling technology significantly reduces the accumulation of organic matter, ensuring accurate and consistent data collection over longer periods in challenging ocean environments.
- **Low Maintenance, High Reliability:** By preventing biofouling, the sensor minimizes the need for frequent maintenance and cleaning, allowing for uninterrupted ocean monitoring and reducing operational costs.
- **Enhanced Data Accuracy:** The anti-biofouling feature ensures reliable performance even in biologically active waters, delivering precise pH and water quality measurements crucial for long-term oceanic research and environmental monitoring.



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OBSEA

EXPANDABLE SEAFLOOR OBSERVATORY