CtrlAQUA

New membrane for CO_2 sensor

RESEARCH QUESTION:

Development of membrane for CO2 gas sensors with antifouling properties.

DURATION: 2016 - 2021

SALINITY TESTED: Brackish water and salt water

HIGHLIGHTS:

- Traditional Teflon has been modified to achieve membrane for CO2 sensors with antifouling properties.
- Membrane was tested in real system using authentic RAS water, worked well but response time somewhat slow.
- Antifouling tests indicated efficient prevention of biofilm coverage.

READ MORE:

Zhang, X., Årstøl, E., Nymark, M., Fages-Lartaud M., Mikkelsen, Ø. The Development of Polydimethysiloxane/ZnO–GO Antifouling Coatings. J Clust Sci 33, 2407–2417 (2022). https://doi.org/10.1007/s10876-021-02165-7
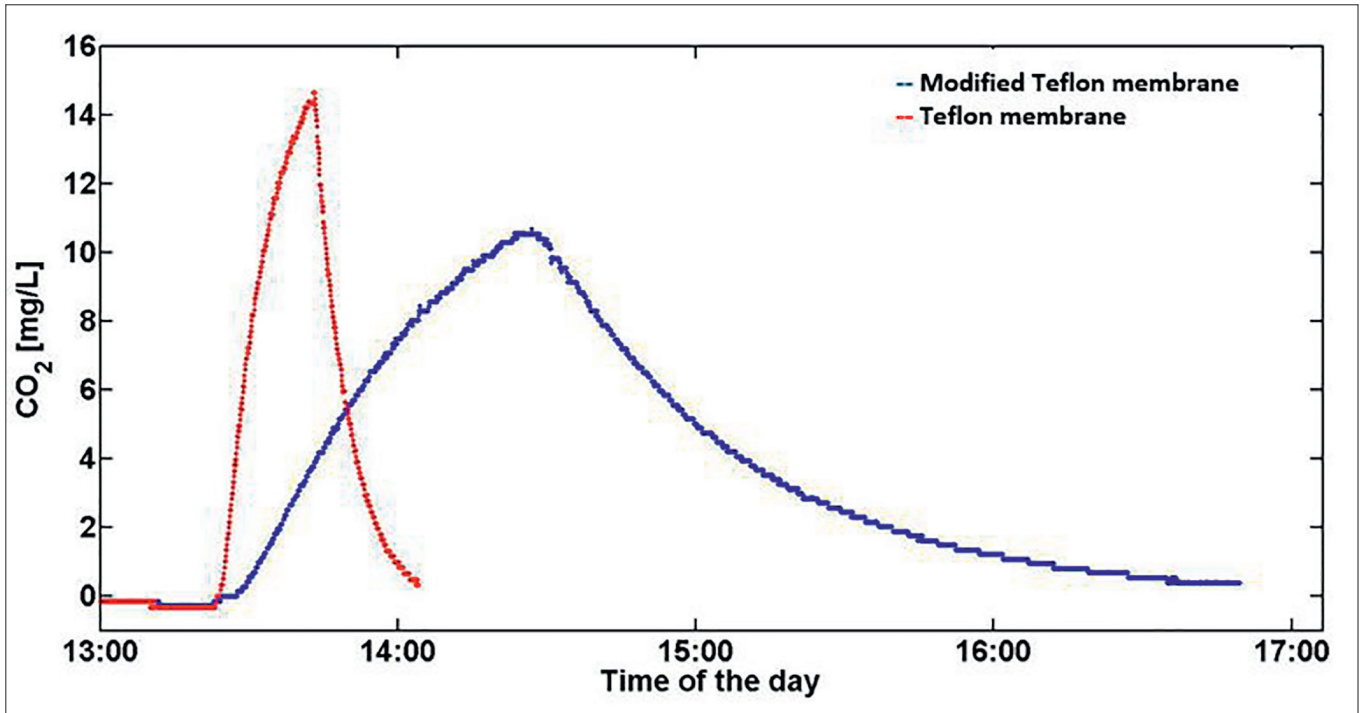
RECOMMENDATIONS:

Antifouling (biofilm) property for CO2 sensors can be achieved by using Teflon coated with polydimethylsiloxane doped with zinc oxide-graphene oxide (PZGO). The antifouling properties of the PZGO composite can be explained by high surface roughness and hydrophobicity. Different loadings of doped material were used to optimize the antimicrobial property. The antifouling modified layer did hover effected the response time with 40 minutes delay. The devolved membrane has been tested in laboratory using authentic RAS water (TRL level 5). There are needs for some optimalizations, mainly connected to the thickness of the membrane that should be reduced to achieve faster response time. body length per second.

Response time of CO2 sensor with and without modified antifouling membrane.