



An advanced prototype of a fluorescence-based oil-in-water analyzer

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An advanced prototype of a fluorescence-based oil-in-water analyzer

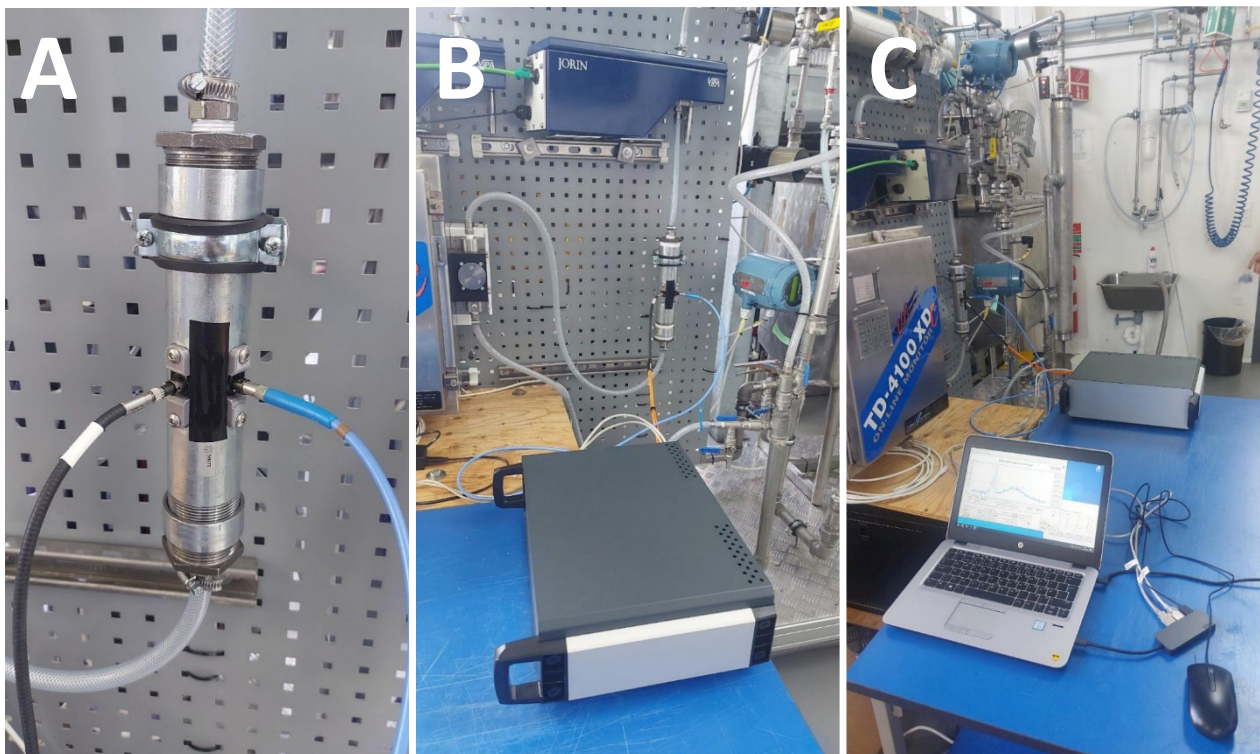
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The crude oil content in produced water (PW) in the North Sea is regulated by the OSPAR agreement, which establishes 30 mg L⁻¹ as the maximum concentration of dispersed crude oil. However, it is well-known that the aromatic fraction of crude oil is the biggest environmental concern, as it is toxic and highly soluble in water, which makes it difficult to remove by physical methods before discharge. This gives rise to the importance of in-/online monitoring of crude oil concentrations in PW throughout the cleaning processes, and fluorescence spectroscopy arises in that context as a promising analytical technique as it provides fast or instant measurements and is low-priced and exempt from sample preparation steps. This project aims at using fluorescence spectroscopy together with advanced data analysis tools to develop a commercial sensor to monitor the concentration of crude oil in water in real-time. Our primary target is PW, but the theory and setup of the proposed sensor extend to any application with fluorescent pollutants in water. In the present work, we will share the main features of the second generation of our advanced prototype and present some of the latest results of tests in a flow-loop setup.



Pictures of **(A)** the first sensor head installed in a flow-loop setup, **(B)** the optical unit (prototype v1), and **(C)** signal recording.