

Non-Adiabatic Silica Microfibre Sensor for BOD/COD Ratio Measurement

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Abstract : A miniaturized non-adiabatic silica microfiber is proposed for biological oxygen demand (BOD) ratio chemical oxygen demand (COD) sensing for the first time. BOD and COD are two main parameters to justify quality of wastewater. A ratio, BOD:COD can usually be established between the two analytical methods once COD and BOD value has been gathered. This ratio plays a vital role to determine appropriate strategy in wastewater treatment. A non-adiabatic microfiber sensor was formed by tapering the SMF to generate evanescent field where sensitive to perturbation of sensing medium. Because difference ratio BOD and COD contain in solution, this may induced changes of effective refractive index between microfiber and sensing medium. Attenuation wavelength shift to right with 0.5 nm and 3.5 nm while BOD:COD equal to 0.09 and 0.18 respectively. Significance difference wavelength shift may relate with the biodegradability of analyte. This proposed sensor is compact, reliable and feasible to determine the BOD:COD. Further research and investigation should be proceeded to enhance sensitivity and precision of the sensor for several of wastewater online monitoring.

Keywords : non-adiabatic fiber sensor, environmental sensing, biodegradability, evanescent field

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