Electronic Supplementary Information

A fluorimetric nitrite biosensor with polythienothiophene-fullerene thin film detectors for on-site water monitoring

Nuno Miguel Matos Pires[a,b,c], Tao Dong[b,*], Zhaochu Yang[a]

[a] Chongqing Key Laboratory of Micro-Nano Systems and Smart Transduction, Collaborative Innovation Center on Micro-Nano Transduction and Intelligent Eco-Internet of Things, Chongqing Key Laboratory of Colleges and Universities on Micro-Nano Systems Technology and Smart Transducing, National Research Base of Intelligent Manufacturing Service, Chongqing Technology and Business University, Nan`an District, Chongqing, 400067, China

[b] Department of Microsystems - IMS, Faculty of Technology, Natural Sciences and Maritime Sciences, University of South-Eastern Norway-USN, P.O. Box 235, 3603 Kongsberg, Norway

[c] Centre for Environmental Radioactivity (CERAD CoE), Norwegian University of Life Sciences (NMBU), Faculty of Environmental Sciences and Natural Resource Management, P.O. Box 5003, NO-1432 Ås, Norway

[*]Corresponding author: Tel: +47 3100 9321. E-mail: tao.dong@usn.no;

Nanomaterial characterization

Surface morphology

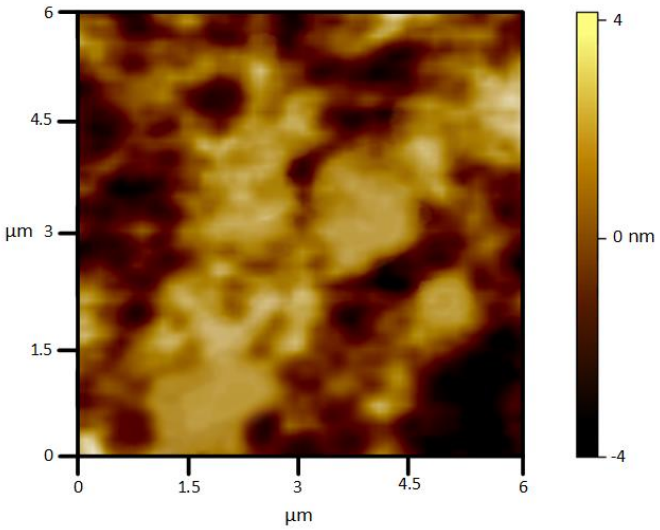

Fig. S1 AFM topography image (scan size 6×6µm) of the fabricated BHJ film.

Experimental methods

Composition of aquaculture background water

Table S1. Description of components and quantities for the preparation of aquaculture background water with soft hardness

Components	Concentration in 1L (mg L^{-1})	Molar Mass (g mol^{-1})
$NaHCO_3$	12	84.01
$CaSO_4x\ 2H_2O$	7.5	172.19
$MgSO_4$	7.5	120.38
KCl	0.5	74.55

Experimental results

Calibration curve with aquaculture background water

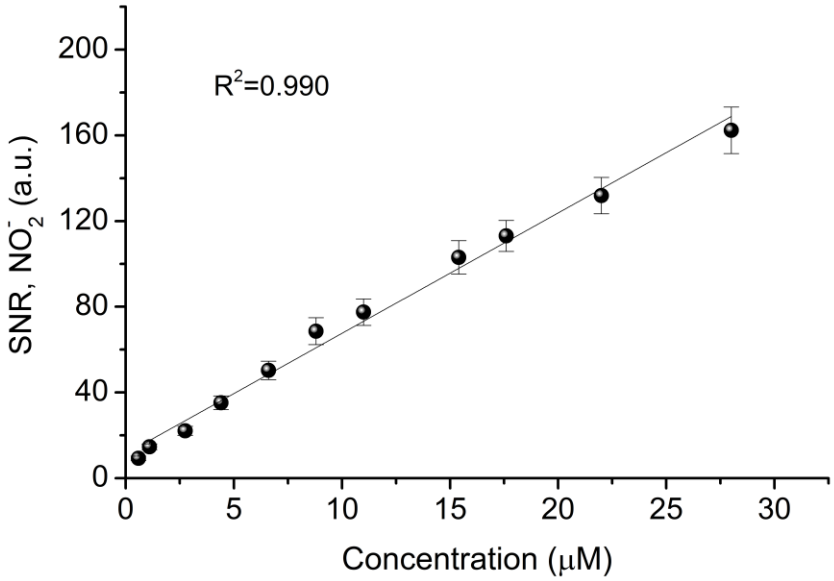

Fig. S2. Dose-response curve of nitrite detection in aquaculture background water using the PTB7:$PC_{70}BM$ OPD fluorimetric biosensor. SNR was determined by the ratio of photocurrent due to nitrite detection to that obtained with no addition of water sample. Detection tests were conducted in triplicate (n=3), RSD<9.5%.

Experimental results

Detection tests in different matrices

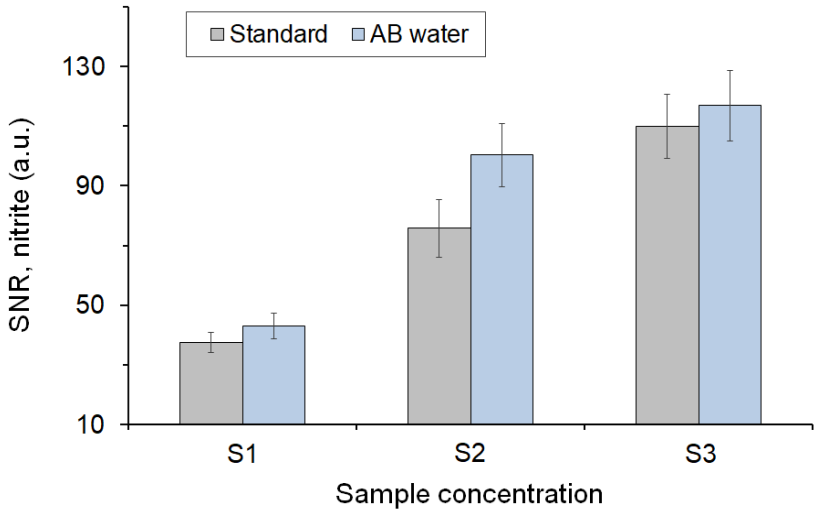

Fig. S3. Detection of nitrite in standard (DI water background) and aquaculture background water samples using the PTB7:$PC_{70}BM$ OPD fluorimetric biosensor. Detection tests were conducted in triplicate (n=3) for the concentrations 5.5 μM (S1), 15.4 μM (S2) and 20 μM (S3).