Supporting Information

Stable Organic Field-effect Transistors for Continuous and Non-destructive Sensing of Chemical and Biologically Relevant Molecules in Aqueous Environment

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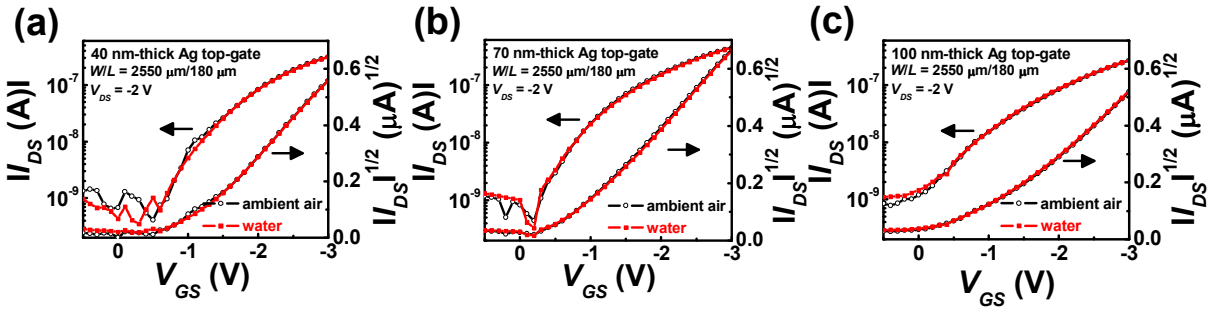

Figure S1. Comparison of the transfer characteristics measured in ambient air and under 2 μL water droplet with the following thicknesses of Ag top-gate OFETs: (a) 40 nm (b) 70 nm (c) 100 nm.

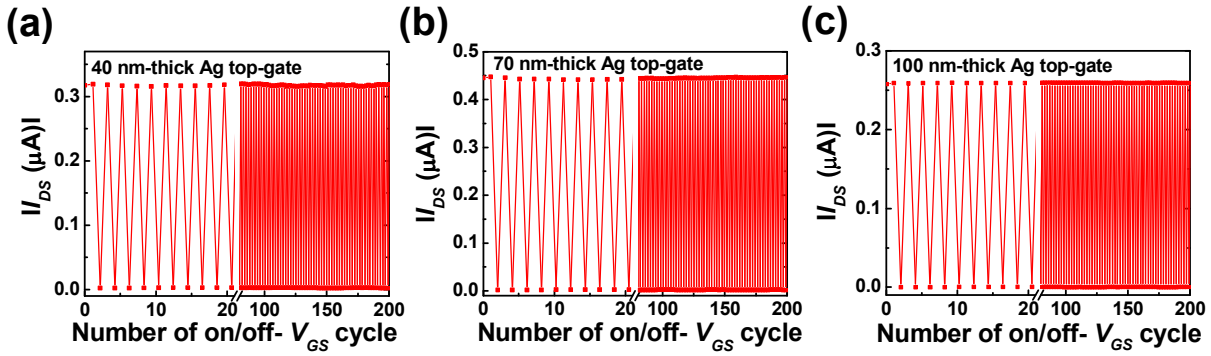

Figure S2. I_{DS} vs. V_{GS} (3 to -3 V) at a V_{DS} (-2 V) measured up to 200 cycles (1 cycle = 1 s) under 2 μL water droplet with the following thicknesses of Ag top-gate OFET: (a) 40 nm (b) 70 nm (c) 100 nm. It is noted that initial 20 cycles are expanded for clarity.

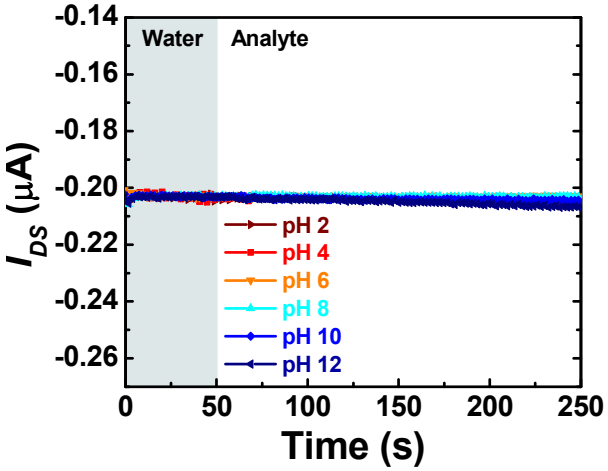

Figure S3. I_{DS} response of 100 nm-thick Ag top-gate OFET sensor for pH buffer solutions measured at V_{GS} (-1.5 V) and V_{DS} (-0.6 V).

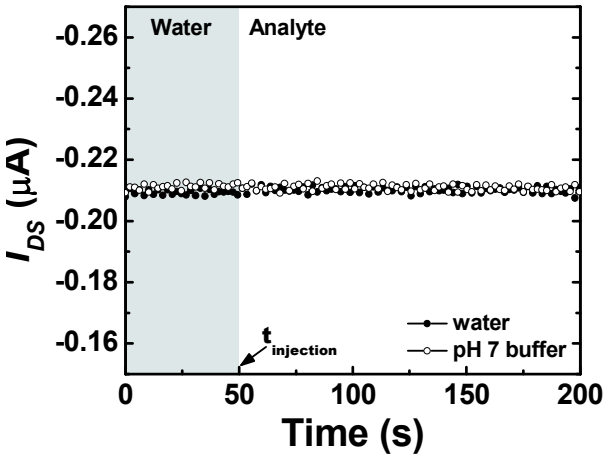

Figure S4. I_{DS} response of 25 nm-thick Ag top-gate OFET sensor for water and pH 7 buffer measured at V_{GS} (-3 V) and V_{DS} (-2 V). The pH 7 buffer (Hydrion®, Sigma-Aldrich) is consisted of potassium phosphate monobasic (30 - 40 wt%) and sodium phosphate dibasic (60 - 70 wt%).

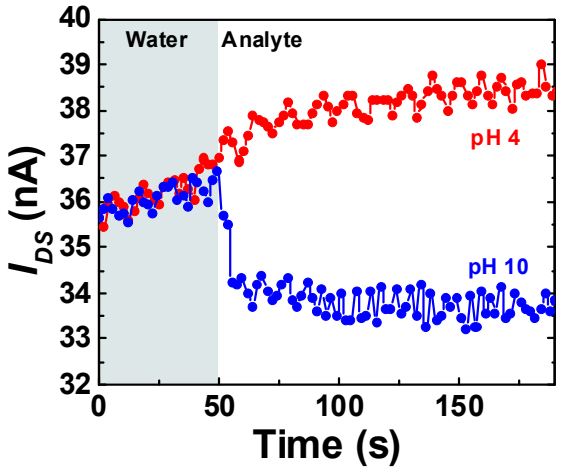

Figure S5. I_{DS} response of 25 nm-thick Ag top-gate *n*-channel OFET sensor using bis(thienyl)tetrazine-bridged naphthalene diimide (NDI-BTTZ-NDI) for pH buffer solutions measured at V_{GS} (-3 V) and V_{DS} (-2 V)[1].

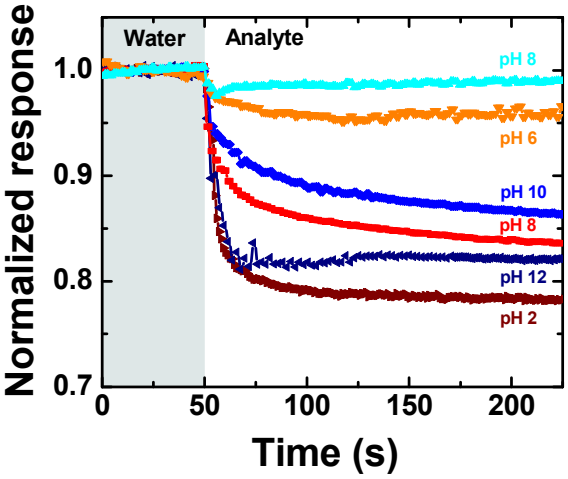

Figure S6. Normalized I_{DS} response of 25 nm-thick Ag top-gate OFET sensor for pH buffer solutions measured at V_{GS} (-3 V) and V_{DS} (-2 V).

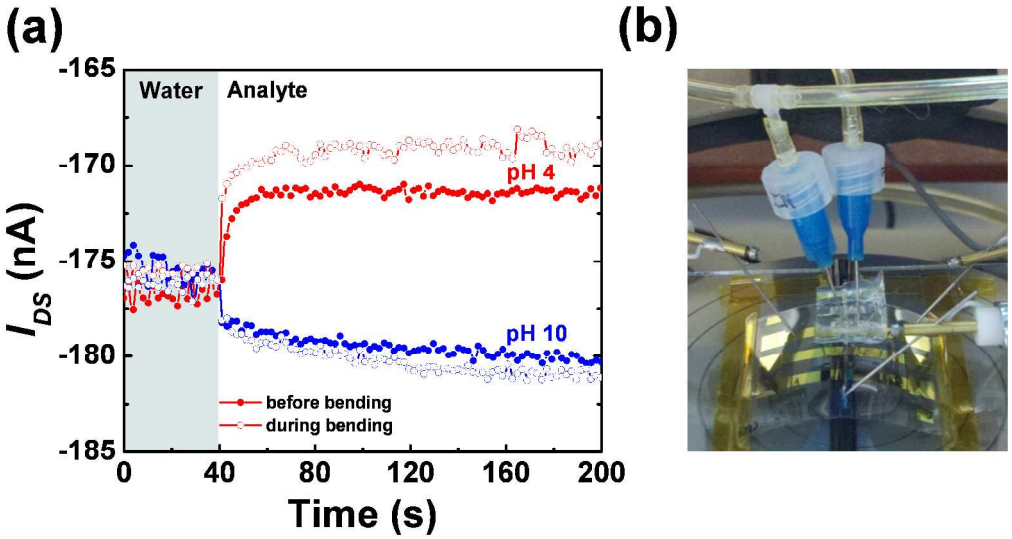

Figure S7. (a) I_{DS} response of 25 nm-thick Ag top-gate OFET on PES substrate for pH buffer solutions measured at V_{GS} (-3 V) and V_{DS} (-2 V) (b) Microfluidic flow cell laminated on the mechanically bent top-gate OFET sensor on PES substrate[2].

References

[1] D. K. Hwang, R. R. Dasari , M. Fenoll, V. A.-Rizzo, A. Dindar, J. W. Shim. N. Deb, C. F.-Hernandez, S. Barlow, D. G. Bucknall, P. Audebert, S. R. Marder, B. Kippelen, *Adv. Mater*. **2012**, 24, 4445.

[2] D. K. Hwang, C. F.-Hernandez, J. B. Kim, W. J. Potscavage Jr., B. Kippelen, *Org. Electron*. **2011**, 12, 1108.