Fiber-Optic Probes for Real-Time pH Monitoring

Mohamed Elsherif[a,b]*, Fahad Alam[a,c], Ahmed E. Salih[a], Xinyu Wang[d], Peter R. Corridon[,e,f,g],

Khalil B. Ramadi[b,h], Haider Butt[a]*

[a]Department of Mechanical Engineering, Khalifa University, Abu Dhabi 127788, UAE

[b]Division of Engineering, New York University Abu Dhabi, Abu Dhabi 129188, UAE

[c]Department of Electrical and Computer Engineering, King Abdullah University (KAUST) 23955, SA

[d]Department of Biomedical Engineering, Khalifa University, Abu Dhabi 127788, UAE

[e]Department of Immunology and Physiology, College of Medicine and Health Science, Khalifa University, Abu Dhabi 127788, UAE
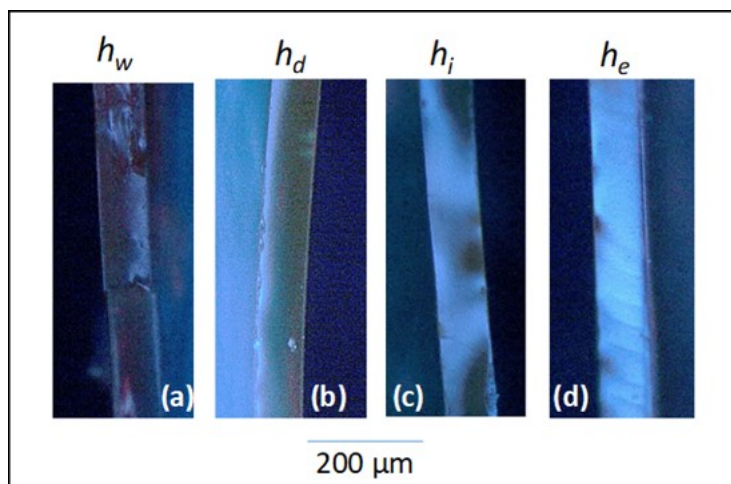
[f]Healthcare Engineering Innovation Center, Khalifa University, Abu Dhabi 127788, UAE

[g]Center for Biotechnology, Khalifa University, Abu Dhabi 127788, UAE

[h]Tandon School of Engineering, New York University, NY 11201, USA
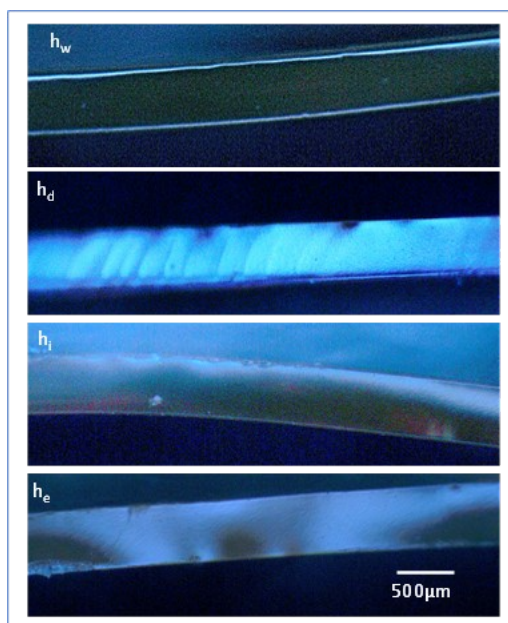
Figure S1. Optical microscope images for cross-sections of the free-standing developed pH-responsive sensors, the sensor's thickness is 500 μm.

Figure S2. Cross-section of the developed thin pH-responsive sensors. (a-d) optical microscope images for the cross-section of the pH sensors based on deionized water, DMSO, isopropanol, and ethanol as the red dye's solvents, respectively.
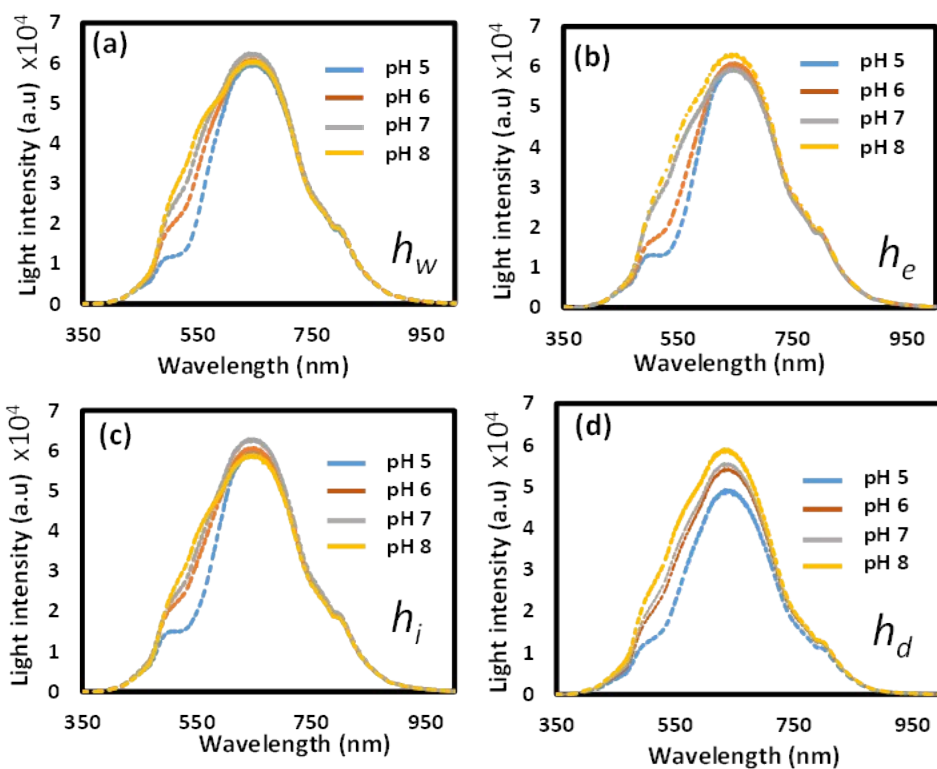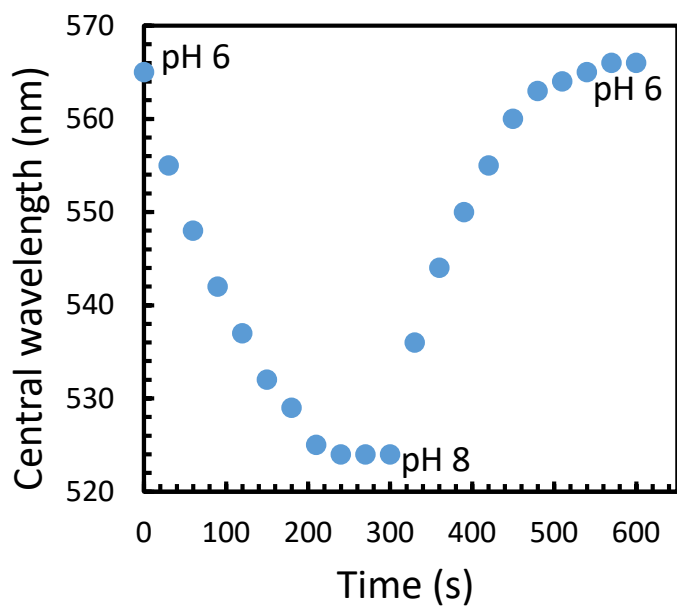

Figure S3. Light intensity measurements for the four sensors while the sensors were exposed to media of different pH: (a) h_w, (b) h_e, (c) h_i, and (d) h_d.
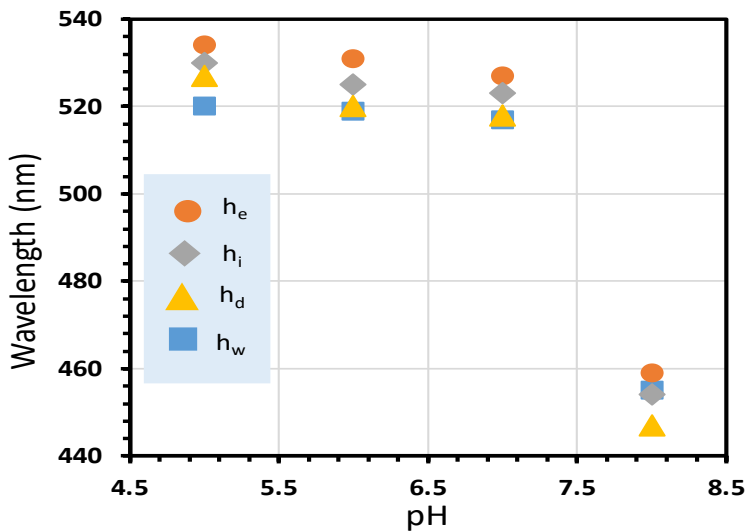
Figure S4. Absorption peak positions for the developed four sensors while they were immersed in different pH buffers.
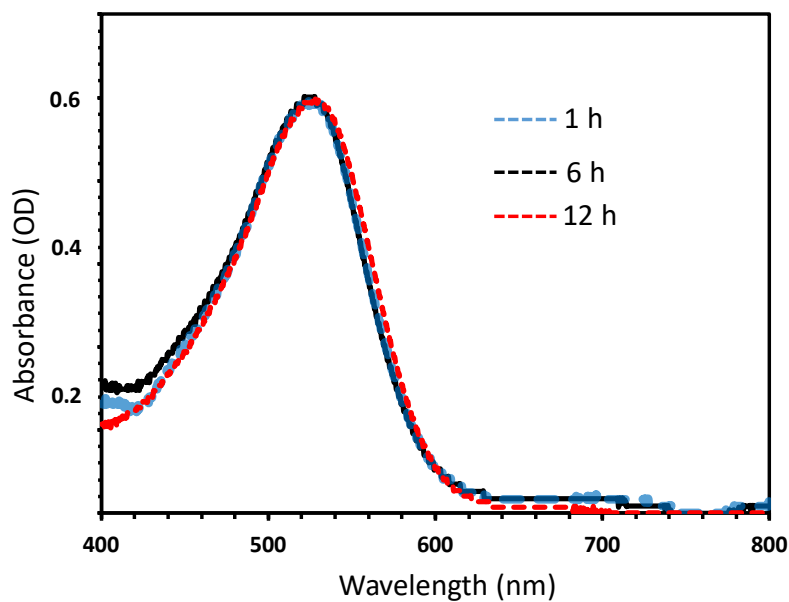
Figure S5. Absorbance of the h_w sensor recorded over time while the sensor was stored in PBS buffer.

Figure S6. The kinetic response of the fiber's tip-attached pH sensor for a complete cycle in media of pH 6 and 8.