Supporting Information

A microsphere-based sensor for point-of-care and non-invasive acetone detection

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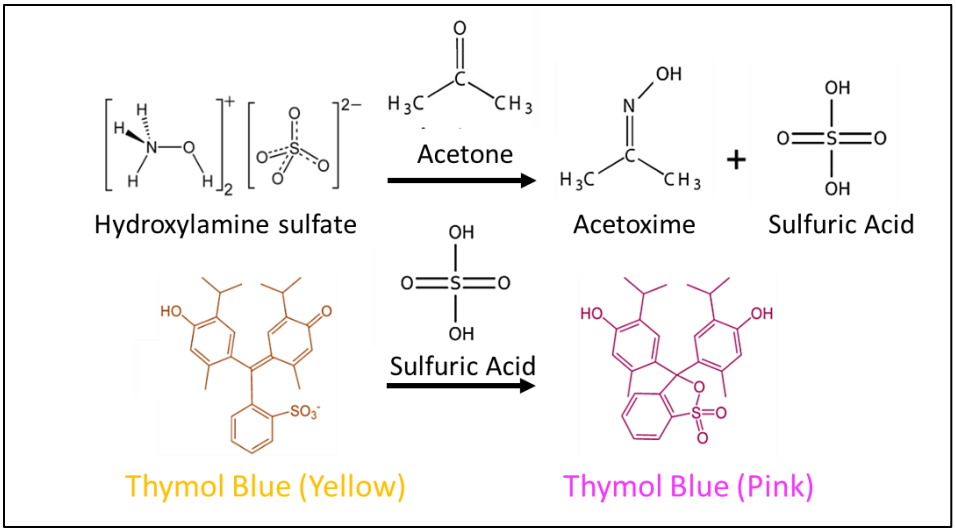

Figure S.1. Colorimetric acetone sensor mechanism.

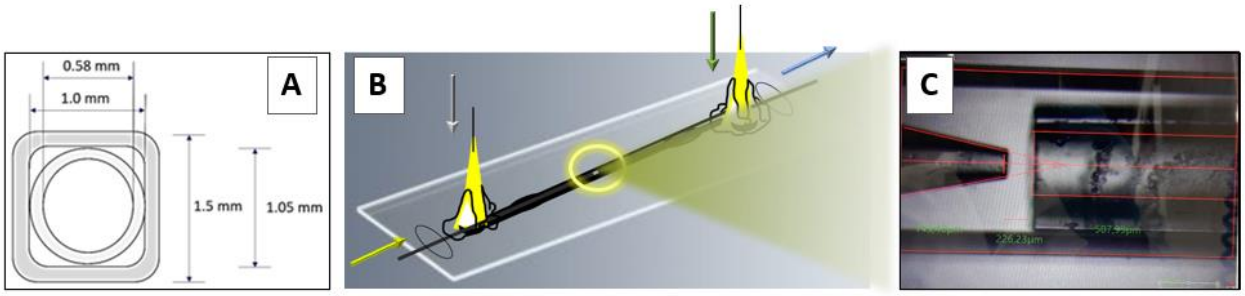

Figure S.2. Fabrication of a capillary glass microfluidic device.

(A) Dimensions of the cylindrical and square capillaries. The cylindrical capillaries are positioned inside the square capillary. **(B)** Schematic of the device on a glass microscope slide. As shown by green and grey arrows, PVA and PDMS solutions are introduced at each end (top). The sensing probe solution enters from the left (yellow arrow), and microspheres are collected from the right (blue arrow). **(C)** Microscope image of the device. Microspheres form in the central region between the cylindrical capillaries (tip and flat tip).

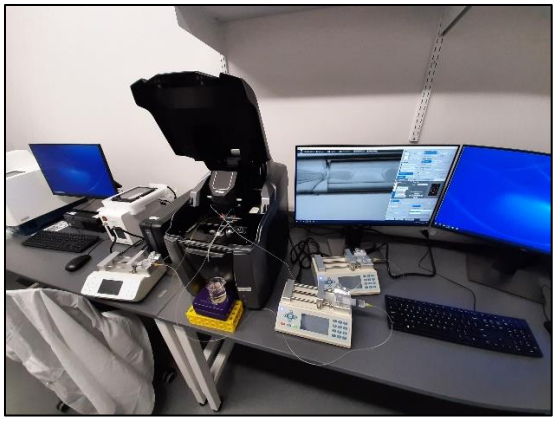

Figure S.3. Experimental setup for microsphere fabrication, showing the microscope and the three pumps for the sensing solution, PDMS, and PVA.

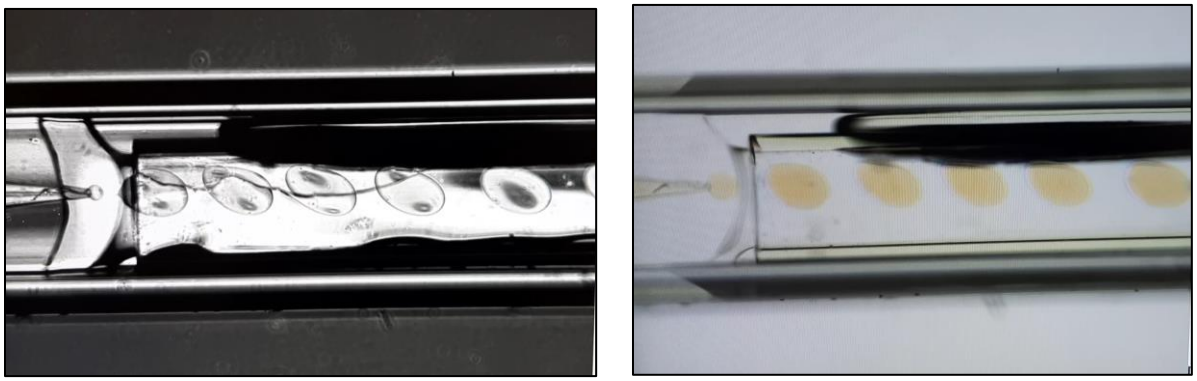

Figure S.4. Microsphere production visualized using brightfield microscopy, shown in monochromatic (left) and color (right) images.

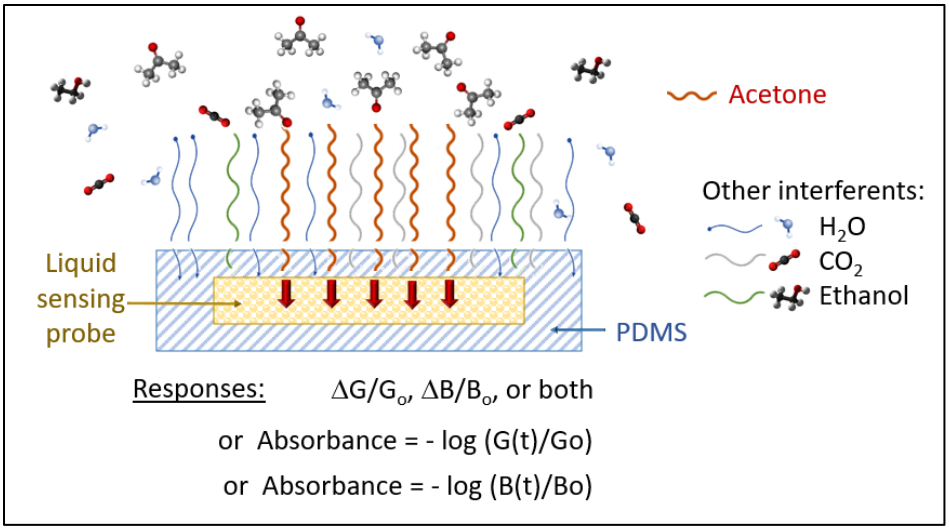

Figure S.5. Planar sensor design including hydroxylamine and thymol blue liquid sensing probe and polydimethylsiloxane (PDMS).

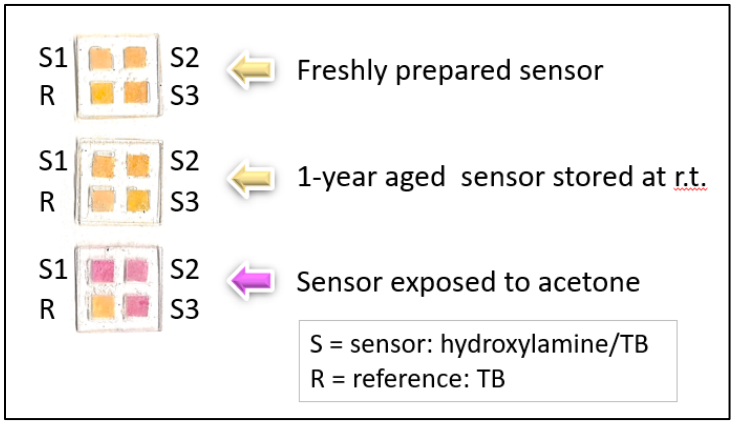

Figure S.6. Sensor stability: Freshly prepared sensor (top), sensor after one year at room temperature (middle), and sensor after acetone exposure (bottom).

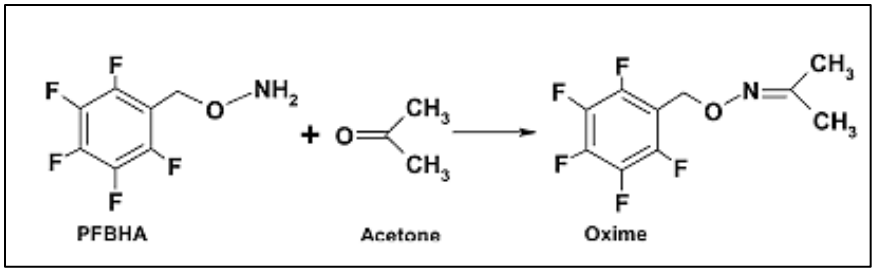

Figure S.7. Acetone derivatization reaction for GC-MS analysis.