Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

Nucleic acid functionalized fiber optic probes for sensing in evanescent wave: Optimization and application

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Chemicals. HF (30% aqueous solution), HNO_3 and all organic solvents were purchased from Beijing Chemical Works. Sodium chloride (NaCl), bovine serum albumin (BSA), glutaraldehyde (25% aqueous solution), and 3-aminopropyl-triethoxysilane (APTS) were bought from Sigma-Aldrich, Inc. Glycine and cyanoborohydride ($NaCNBH_3$) were purchased from AMRESCO LLC.

Buffers. All aqueous solutions were prepared using molecular biology grade USP sterile purified water (Corning Cellgro, NY, USA). Tris buffer: 10 mM Tris-HCl, 50 mM NaCl, 50 mM $MgCl_2$, pH 7.4; Ade binding buffer: 20 mM Tris, 5 mM $MgCl_2$, 300 mM NaCl, pH 7.8; Equilibrium buffer: 10 mM PBS, pH 7.4 (diluted from phosphate buffered saline packs, Thermo Fisher Scientific Inc.); Washing buffer: 0.5% SDS, pH 1.9.

Instrument. The diameters were monitored with a microelectrode polisher (2002-C, Inbio Life Science Instrument Co., Ltd., China). The surface morphologies of different fiber surfaces were observed scanning electron microscopy (SEM, JEOL, JSM-700AF).

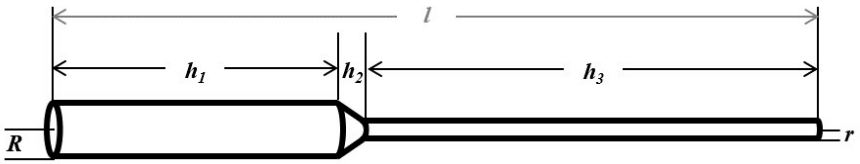

Fig. S1 Schematic structure of a combination tapered silica fiber after the removal of cladding. (l = 8.5 cm, R = 300 μm, r = 110 μm, h_1 = 3.5 cm, h_2 = 0.2 cm, h_3 = 4.8 cm)

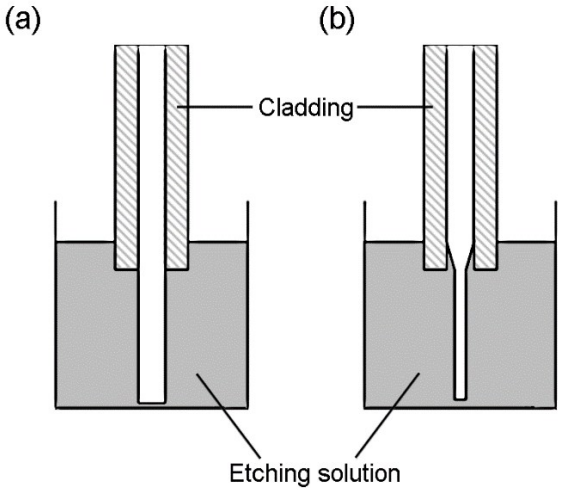

Fig. S2 Etching solution based wet-process for the fabrication of combination tapered silica fiber. Schematic structure of a silica fiber before (a) and after (b) the etching process.

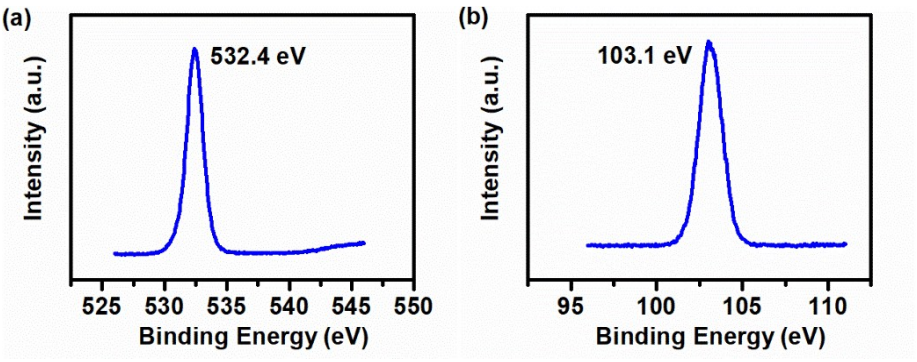

Fig. S3 XPS spectra of SiO_2 prior to etching: (a) O 1s; (b) Si 2p.

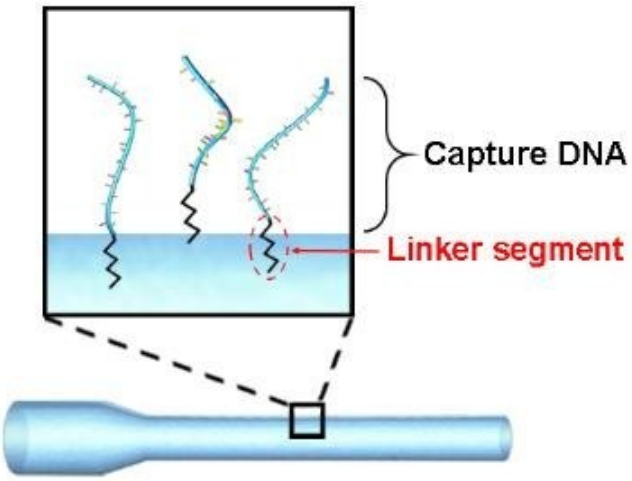

Fig. S4 Schematic illustration of the ssDNA immobilized EWFO surface. Typically, an immobilized ssDNA contains two regions: the linker segment and the capture DNA.