Electronic Supporting Information

In Situ Growth of Au-Ag Bimetallic Nanorings on Optical Fibers for

Enhanced Plasmonic Sensing

Se Shi,^{‡ab} Anran Li,^{‡c} Renliang Huang,^d Jing Yu,^e Shuzhou Li,^{*e} Wei Qi,^{af} Zhimin He,^a

and Rongxin Su*afg

^a State Key Laboratory of Chemical Engineering, Tianjin Key Laboratory of Membrane Science and Desalination Technology, School of Chemical Engineering and Technology, Tianjin University, Tianjin 300072, China

^b State Key Laboratory of Marine Resource Utilization in South China Sea, Hainan University, Haikou 570228, China

^c Beijing Advanced Innovation Center for Big Data-Based Precision Medicine, School of Medicine and Engineering, Beihang University, Beijing 100191, China

^d School of Environmental Science and Engineering, Tianjin University, Tianjin 300072, China

^e School of Materials Science and Engineering, Nanyang Technological University, Singapore 639798, Singapore

^f Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), Tianjin 300072, China

^g School of Marine Science and Technology, Tianjin University, Tianjin 300072, China

[‡] These authors contributed equally to this work.

*Correspondence and requests for materials should be addressed to S. Li (email: lisz@ntu.edu.sg)

and R. Su (email: surx@tju.edu.cn)

Supplementary Figures



Figure S1. (a) Real and (b) imaginary parts of the dielectric function of the Au-Ag alloy with the atomic ratio Au/Ag of 3.3 calculated based on the modified Drude–Lorentz model which takes into account the band structure of the metals (Adv. Optical Mater., 2014, 2, 176–182).



Figure S2. Characterization of the PDA layers on the optical fiber. 3D AFM image (a) and high-resolution XPS spectra of the C 1s region (b) of the PDA functional layer.



Figure S3. The model of the Ag NPs on the optic-fiber surface for the calculation of electric field distributions.



Figure S4. Photographs of the Ag NPs based LSPR sensor and Au-Ag NRs based LSPR sensor.



Figure S5. Stability of sensing property for the Au-Ag NRs based LSPR sensors.



Figure S6. Reflectivity spectra (in water) and plot of the resonant wavelength shift (compared with RI:1.333) vs. the RI value of the Au-Ag NRs based LSPR sensors prepared by different reaction times.

Supplementary Tables

Solvent	RI
Water	1.333
Acetonitrile	1.344
Acetone	1.359
Ethanol	1.361
Hexane	1.375
n-Propyl alcohol	1.386

Table S1. Refractive index (RI) values of the different solvents used to measure the sensitivity of the

 prepared sensor to surrounding refractive index change.