NANO MICRO small

pH-Controlled Reversible Assembly and Disassembly of Gold Nanorods

*Zhenhua Sun, Weihai Ni, Zhi Yang, Xiaoshan Kou, Li Li, and Jianfang Wang**

Supporting Information

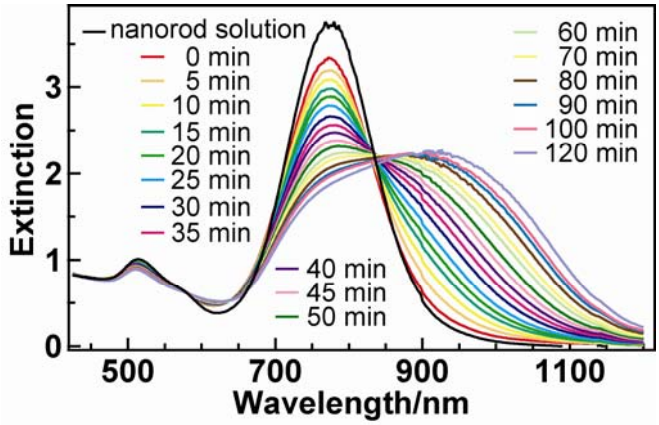

Figure S1. Extinction spectra of Au nanorods taken as a function of time after the addition of MPA. The concentration of MPA in the nanorod solution is 1 mM and the pH of the solution is 9.6.

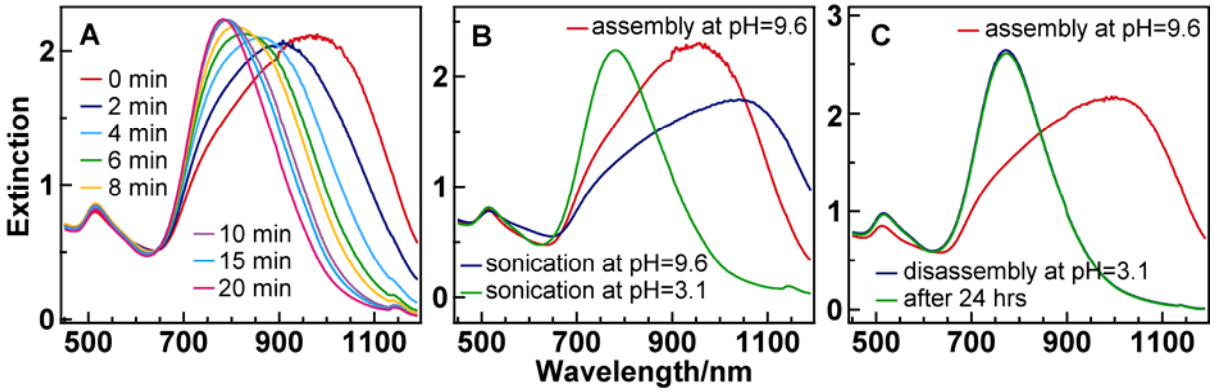

Figure S2. A) Extinction spectra of an assembled Au nanorod solution acquired as a function of the ultrasonication time. The pH of the nanorod solution was adjusted to 3.1 before ultrasonication. B) Extinction spectra of an assembled Au nanorod solution after ultrasonication for 20 min at pH = 3.1 (green) and 9.6 (blue). C) Extinction spectrum of an assembled Au nanorod solution after ultrasonication for 20 min at pH = 3.1 (blue) and that of the disassembled nanorod solution after being kept at room temperature for 24 hrs without ultrasonication (green). The Au nanorods were assembled by adding MPA to a final concentration of 1 mM and then adjusting the pH to 9.6.

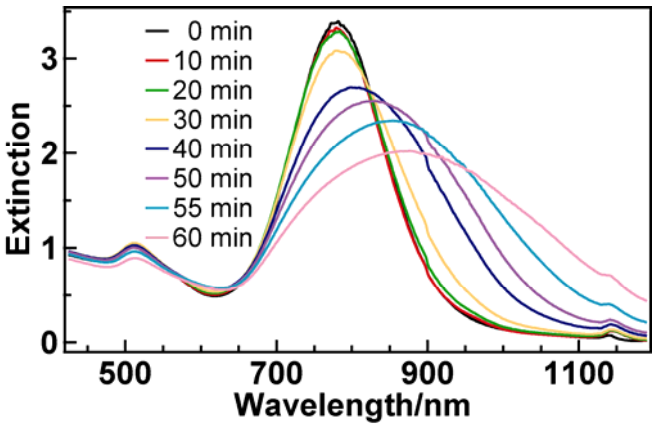

Figure S3. Extinction spectra of Au nanorods acquired as a function of time after the addition of MUA. The concentration of MUA in the nanorod solution is 0.5 mM and the pH of the solution is 7.0.

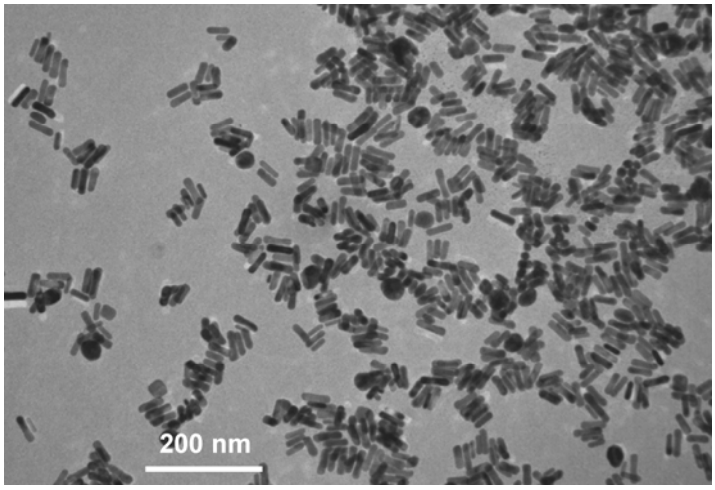

Figure S4. TEM image of SS assembled Au nanorods. The assembly was carried out by using 0.5 mM of MUA at pH = 6.2.

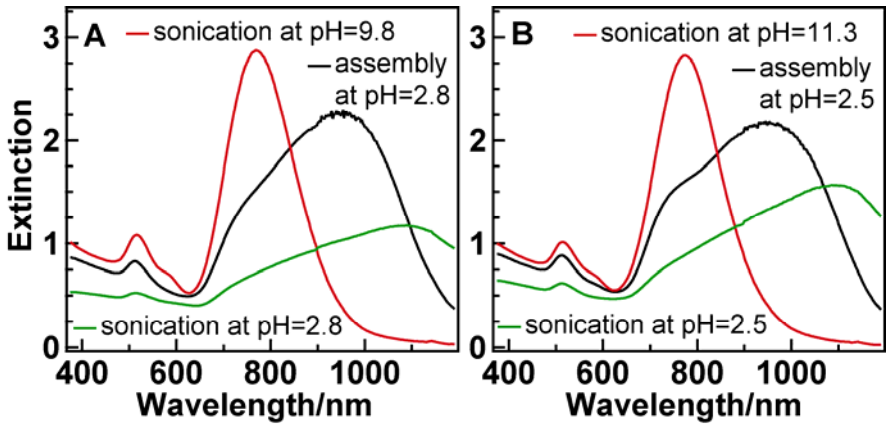

Figure S5. A) Extinction spectra of an assembled Au nanorod solution after ultrasonication for 20 min at pH = 9.8 (red) and 2.8 (green). The assembly was performed by using 0.1 mM of GSH at pH = 2.8. B) Extinction spectra of an assembled Au nanorod solution after ultrasonication for 20 min at pH = 11.3 (red) and 2.5 (green). The assembly was performed by using 1 mM of CYS at pH = 2.5.

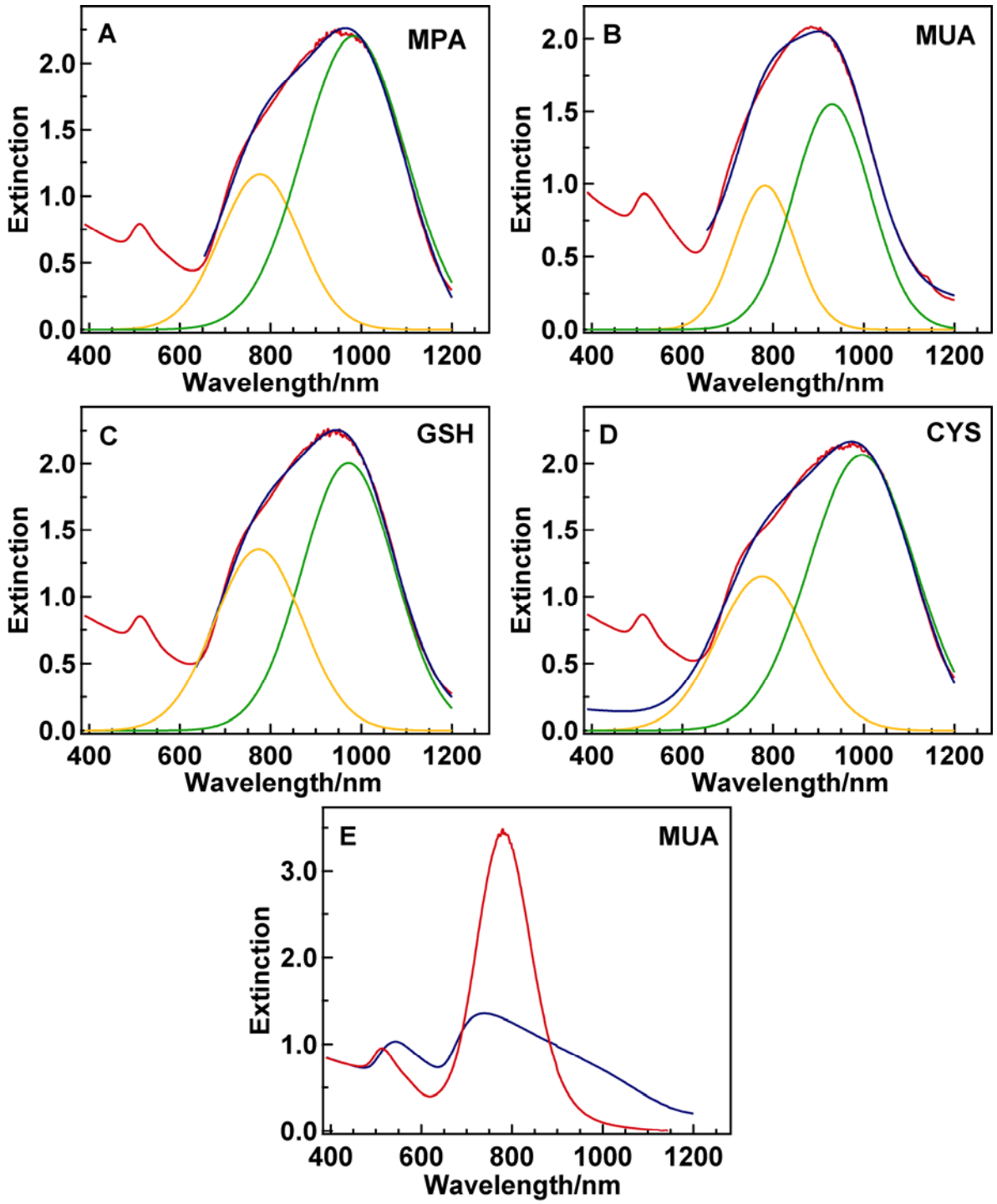

Figure S6. Typical extinction spectra used to estimate the plasmon wavelength shift induced by the assembly of Au nanorods. The spectra of EE assembled Au nanorods are fitted using two Gaussian functions and a linear background. A) MPA-induced EE assembly. The longitudinal plasmon peak is red-shifted from 777 to 984 nm. B) MUA-induced EE assembly. The longitudinal plasmon peak is red-shifted from 782 to 930 nm. C) GSH-induced EE assembly. The longitudinal plasmon peak is red-shifted from 774 to 972 nm. D) CYS-induced EE assembly. The longitudinal plasmon peak is red-shifted from 776 to 996 nm. E) MUA-induced SS assembly. It is difficult to fit the extinction spectrum of assembled Au nanorods using Gaussian functions. The red-shift in the transverse plasmon peak and the blue-shift in the longitudinal plasmon peak are estimated to be 30 and 60 nm, respectively.