

Supplementary Information

On the sintering of gold nanorod assembly towards continuous networks

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Details of ligand exchange for gold nanorods

In order for the AuNRs to be dispersible in ethanol, ligand exchange was performed to replace CTAB with PEG-SH. In a typical experiment, 100 μ L of 5 mM PEG-SH was added to 1 mL of rinsed AuNR dispersion and stirred at 1000 rpm at room temperature for one day to ensure the complete replacement of CTAB with PEG-SH. The UV-vis spectra of the AuNR dispersion before and after the ligand exchange were compared in Fig. S1. Although there is slight change in the peak intensity, no noticeable shift in the peak position was observed. The completeness of the ligand exchange process could be verified with a simple approach. AuNRs capped with CTAB can be well dispersed in aqueous solutions whereas they agglomerate and precipitate in organic solvents. On the other hand, PEG-SH-functionalized AuNRs show good dispersity in both aqueous and organic solvents. When the ligand exchange process was done, same volume of chloroform was added to the AuNR dispersion along with a small amount of ethanol. After violent shaking, the emulsion separated into two layers, with top layer being aqueous solution and the bottom layer being chloroform solution. In a complete ligand exchange, AuNRs would be fully extracted from water phase to organic phase, resulting in a clear top layer and a colored bottom layer, as shown in Fig. S2.

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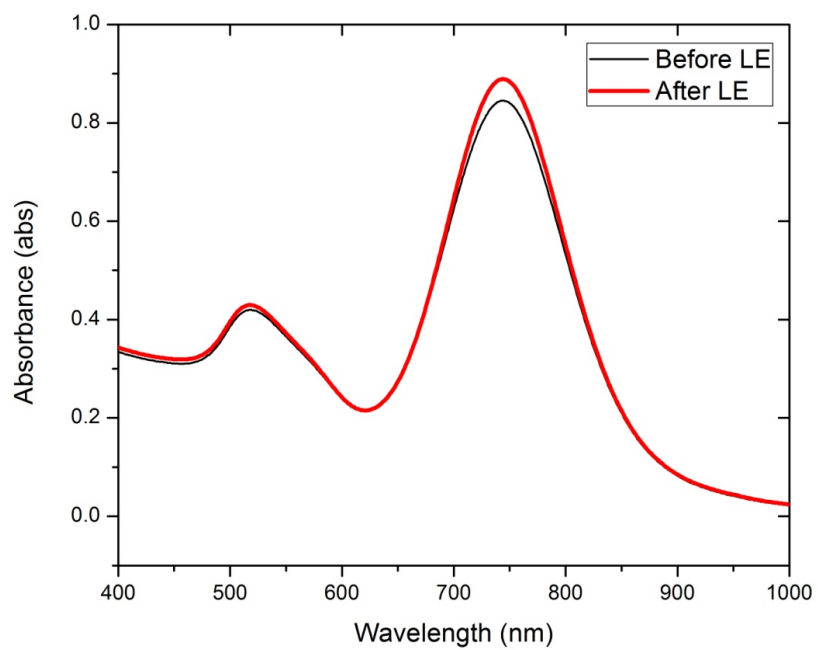


Fig. S1. UV-vis spectra of AuNR dispersion before and after ligand exchange (LE).

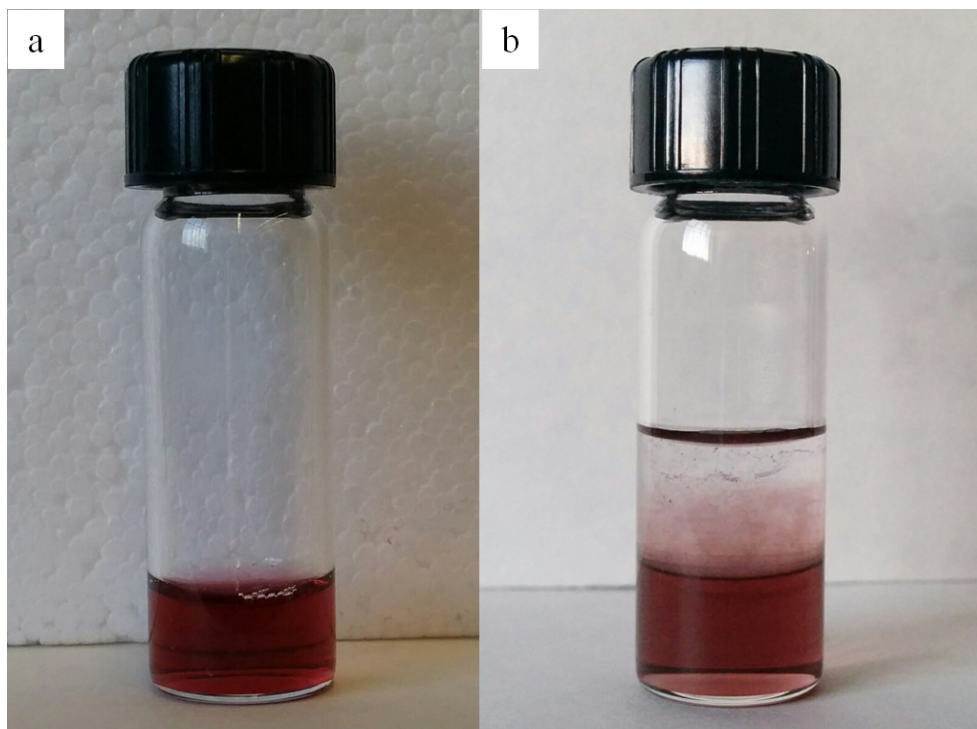


Fig. S2. Photographs of a) aqueous AuNR dispersion before ligand exchange, and b) top layer: water, bottom layer: AuNR dispersion in chloroform after extraction with a small amount of ethanol.