Electronic Supplementary Information
Sacrificed Polymer Thin-film Template with Tunability to Construct High-density Au Nanoparticle Arrays and Their Refractive Index Sensing

Contents: UV-vis spectrum of gold nanoparticles synthesized in PEI (pH 9.5)/PAA (pH 3.2) 9-layer multilayers with loading pH of 11.0 (Fig. S1).

UV-vis spectra of the calcinated sample before and after 40 days’ immersion in pH 2.0 HCl solution (Fig. S2).

UV-vis spectra of the calcinated sample before and after 1 month’s immersion in pH 7.4 10 mM PBS (Fig. S3).

UV-vis spectra of the calcinated sample before and after 9h’s immersion in pH 11 NaOH solution (Fig. S4).

UV-vis spectra of the calcinated sample before and after 28 days’ immersion in pH 11 NaOH solution (Fig. S5).

UV-vis spectra of the calcinated sample before and after immersion in ethanol for 4 min and 12 h (Fig. S6).

UV-vis spectra of the calcinated sample before and after immersion in 2-propanol for 5 min and 12 h (Fig. S7).

UV-vis spectra of the calcinated sample before and after immersion in 1-butanol for 4 min and 12 h (Fig. S8).

UV-vis spectra of the calcinated sample before and after immersion in 1-pentanol for 5 min and 13 h (Fig. S9).

UV-vis spectra of the calcinated sample before and after immersion in DMF for 5 min and 12 h (Fig. S10).

FESEM images of multilayers loaded with HAuCl₄ at pH 4.3 after calcination (A) and multilayers loaded with HAuCl₄ at pH 2.8 before calcination (B) (Fig. S11).
Fig. S1. UV-vis spectrum of gold nanoparticles synthesized in PEI (pH 9.5)/PAA (pH 3.2) 9-layer multilayers with loading pH of 11.0.
Fig. S2. UV-vis spectra of the calcinated sample before and after 40 days’ immersion in pH 2.0 HCl solution.
Fig. S3. UV-vis spectra of the calcinated sample before and after 1 month’s immersion in pH 7.4 10 mM PBS.
Fig. S4. UV-vis spectra of the calcinated sample before and after 9h’s immersion in pH 11 NaOH solution.
Fig. S5. UV-vis spectra of the calcinated sample before and after 28 days’ immersion in pH 11 NaOH solution.
Fig. S6. UV-vis spectra of the calcinated sample before and after immersion in ethanol for 4 min and 12 h.
Fig. S7. UV-vis spectra of the calcinated sample before and after immersion in 2-propanol for 5 min and 12 h.
Fig. S8. UV-vis spectra of the calcined sample before and after immersion in 1-butanol for 4 min and 12 h.
Fig. S9. UV-vis spectra of the calcinated sample before and after immersion in 1-pentanol for 5 min and 13 h.
Fig. S10. UV-vis spectra of the calcinated sample before and after immersion in DMF for 5 min and 12 h.
Fig. S11. FESEM images of multilayers loaded with HAuCl₄ at pH 4.3 after calcination (A) and multilayers loaded with HAuCl₄ at pH 2.8 before calcination (B), and histograms of nanoparticle size distribution (the average sizes are also labeled on respective histograms). The nanoparticle size distribution was obtained with the software ‘ImageJ’ by investigating all the particles on the above FESEM images (2.7×10³ and 1.4×10³ particles for A and B, respectively).