Supporting Information

Synthesis and Extraction of β-D glucose Stabilized Au Nanoparticles Processed into Low Defect, Wide Area Thin Films And Ordered Arrays Using CO_2-Expanded Liquids

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Figure S1: Digital image of an aqueous dispersion of β-D glucose stabilized Au nanoparticles

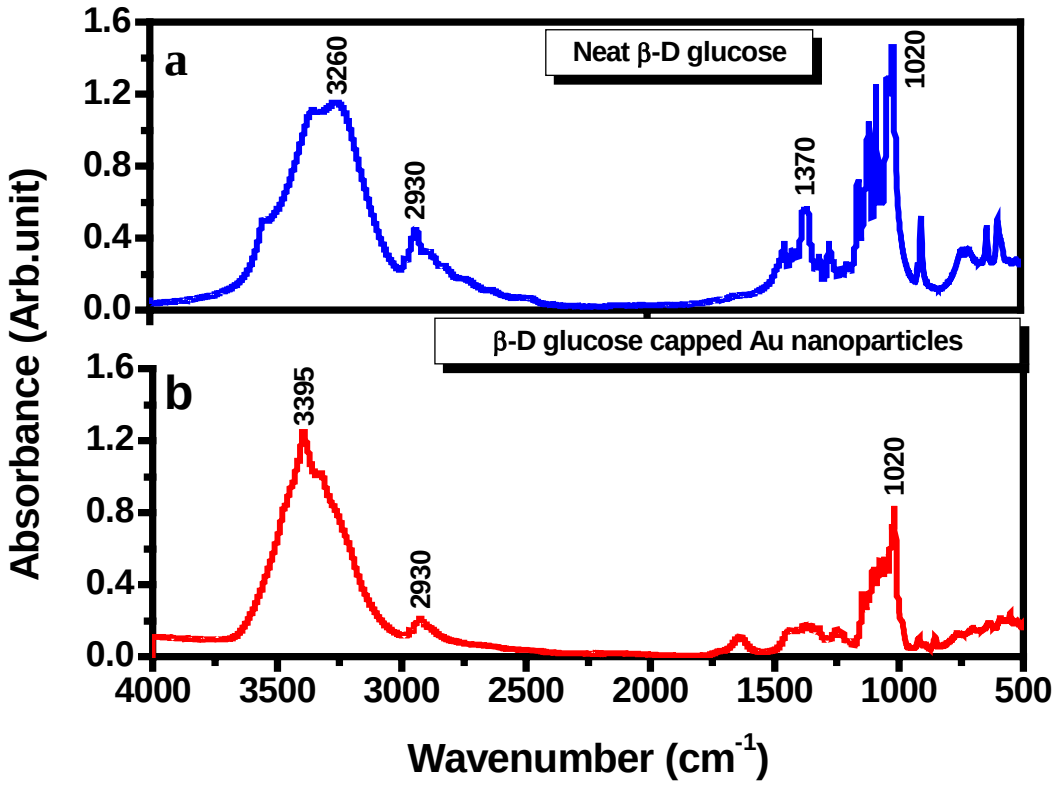

Figure S2: FT-IR spectra of neat β-D glucose (a) and β-D glucose coated Au nanoparticles (b)

Preparation of FT-IR sample: Initially, an aqueous Au nanoparticle dispersion was centrifuged for 15 minutes at a speed of 6000/rpm where a significant portion of the Au nanoparticles were precipitated on the bottom of the centrifuge tube. A polyethylene transfer pipette was used to withdraw the highly concentrated Au nanoparticle aqueous solution from the bottom of the centrifuge tube. This process of centrifugation and withdrawal was repeated three times to remove the Au nanoparticles from the bulk phase thereby leaving most of the unbound β-D glucose and isolated ions in the upper solution. A centrifugal membrane with a molecular weight cutoff of 3000 (PALL Life Science) was subsequently employed to further remove excess glucose and isolated ions. Freeze-drying under vacuum was then applied overnight to obtain a dry Au nanoparticle composite. Finally, the FT-IR samples were obtained by forming a thin pellet of transparent KBr (95 mg) and Au nanoparticles (1 mg). Figure S2 (a) presents the pure β-D glucose IR spectrum where a broad band centered at 3260 cm^{-1} was observed, undoubtedly resulting from the -OH stretch of the β-D glucose molecules.

Figure S3: Digital images illustrating the effective extraction of Au nanoparticles from an aqueous β-D glucose solution into a hexane phase via ligand exchange from β-D glucose to dodecanethiol. These images display the generation of highly concentrated dodecanethiol capped Au nanoparticle dispersions in hexane.

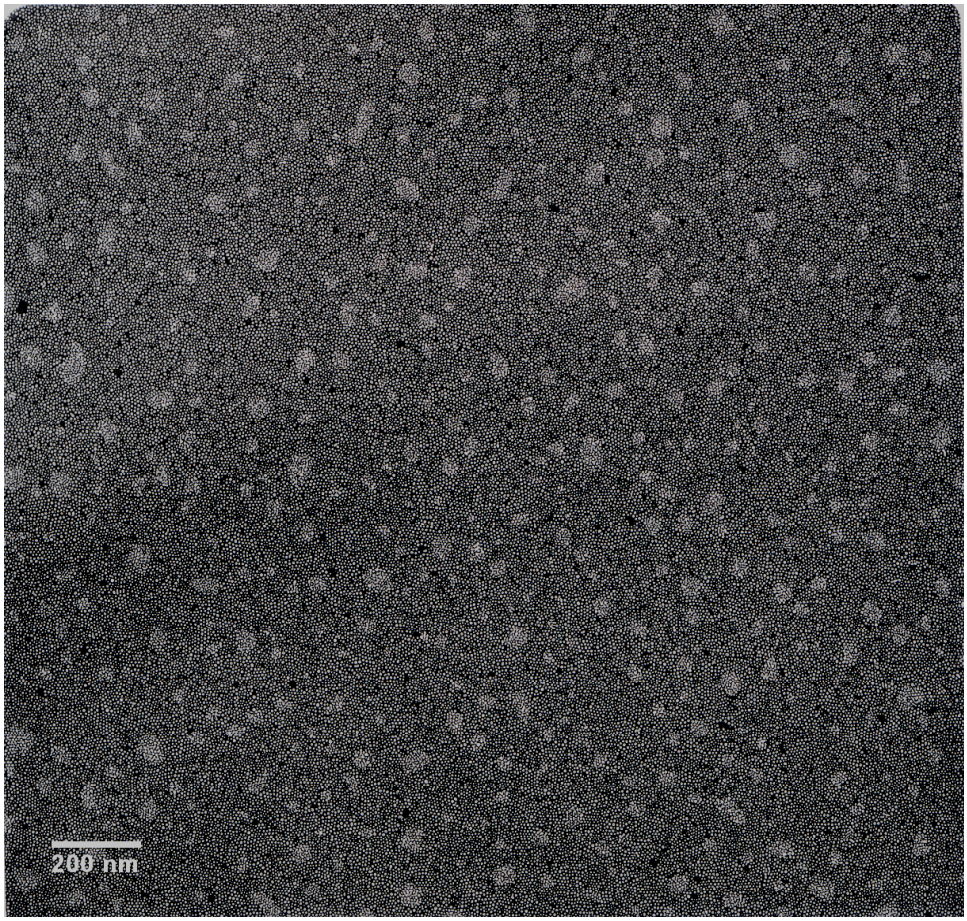

Figure S4: Low magnification TEM image of a closed packed and locally ordered Au nanoparticles thin film over a wide area of 4.2 μm^2 (150µL of 3.5×10^{-4} M Au in hexane dispersion was employed).

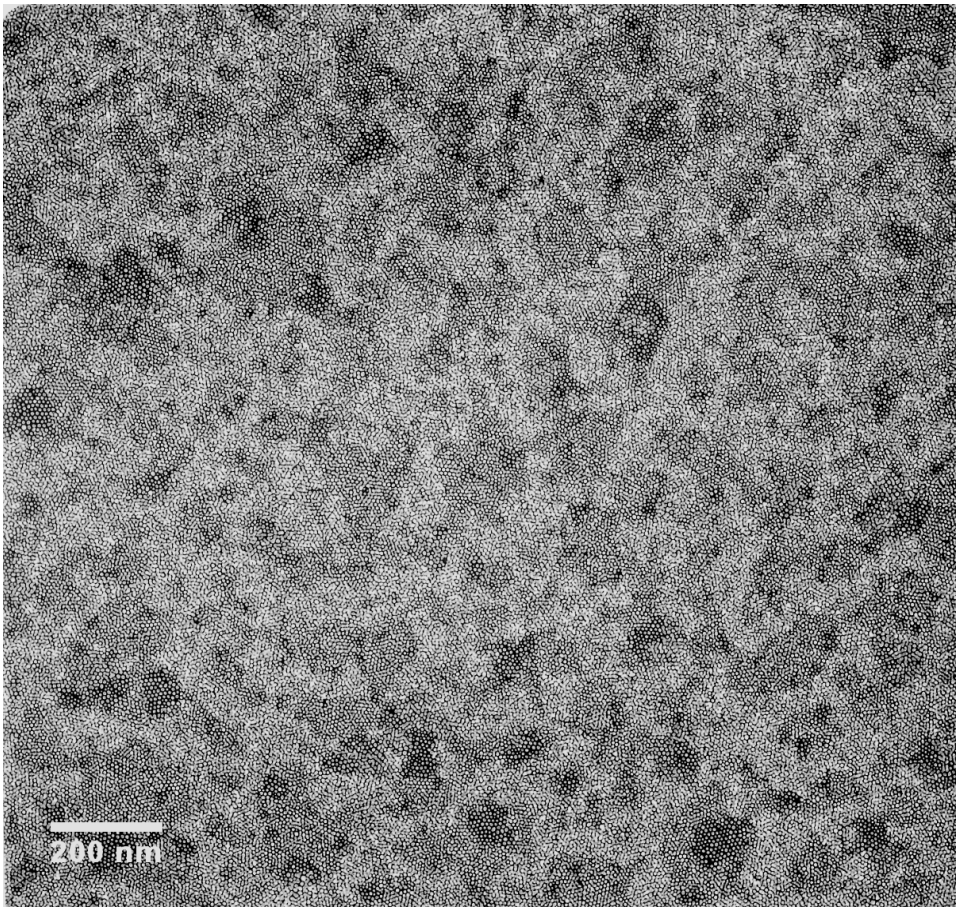

Figure S5: TEM image demonstrating the generation of a wide-area Au nanoparticle multilayer film (3.0 μm^2 and 250μL of 3.5×10^{-4} M Au in the hexane dispersion was employed).