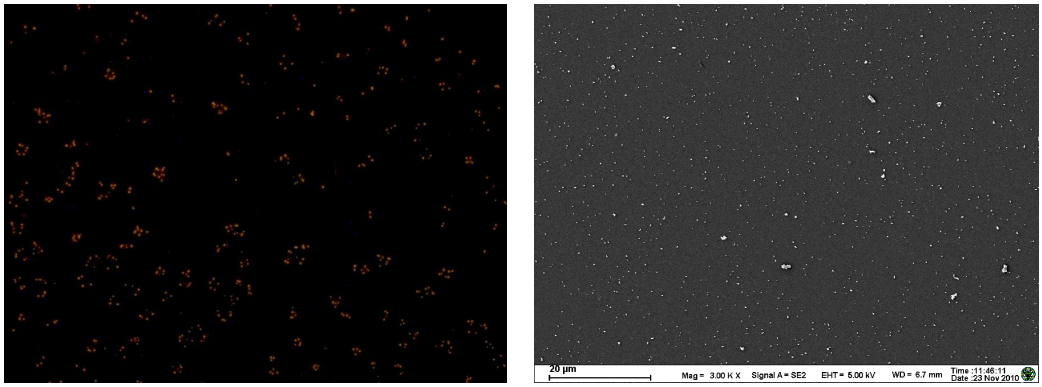
Supporting Information

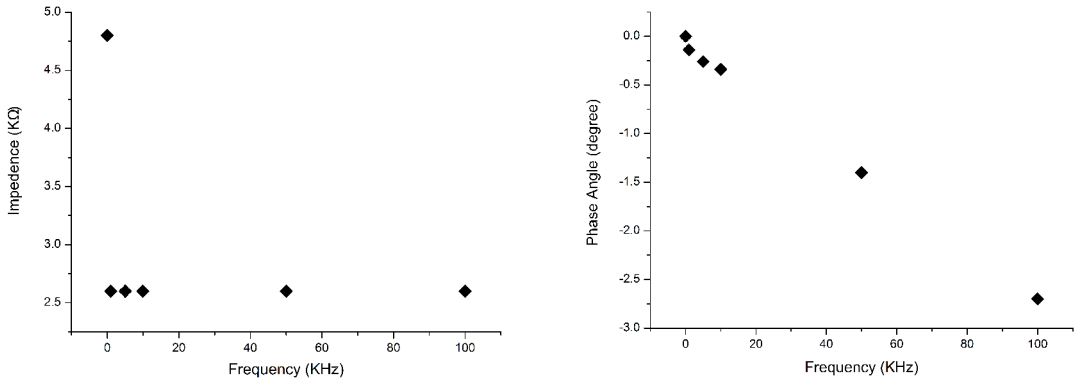
Figure S1: Morphological images of gold nanoshells after assembly.



A **B**

Figure S1: Morphological images of gold nanoshells after assembly. **A**, optical image (×200) of assemblies under 100KHz alternating magnetic field on the glass substrate. **B**, SEM image of assemblies under 50KHz alternating magnetic field on the Si substrate.

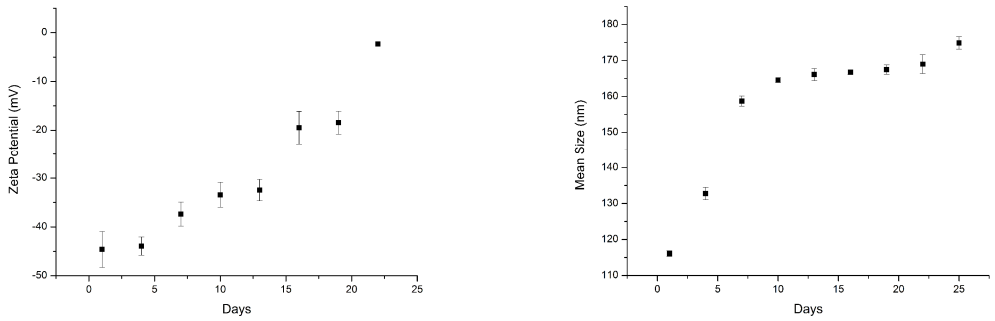
Figure S2: Impedance measurement of Si wafer as the substrate.



A **B**

Figure S2: Impedance measurement of Si wafer as the substrate. **A**, amplitude of impedance. B, phase angle of impedance.

Figure S3: Measurements of DLS and ζ potential for nanoshells with ion amount decreasing.



A B

Figure S3: measurements of ζ potential and DLS for nanoshells with ion amount decreasing (The ion amount decreased every 3 days, hence the number of days was used as the abscissa). **A**, ζ potential. **B**, DLS.

Figure S4: SEM image of 40nm hollow Au nanoshells

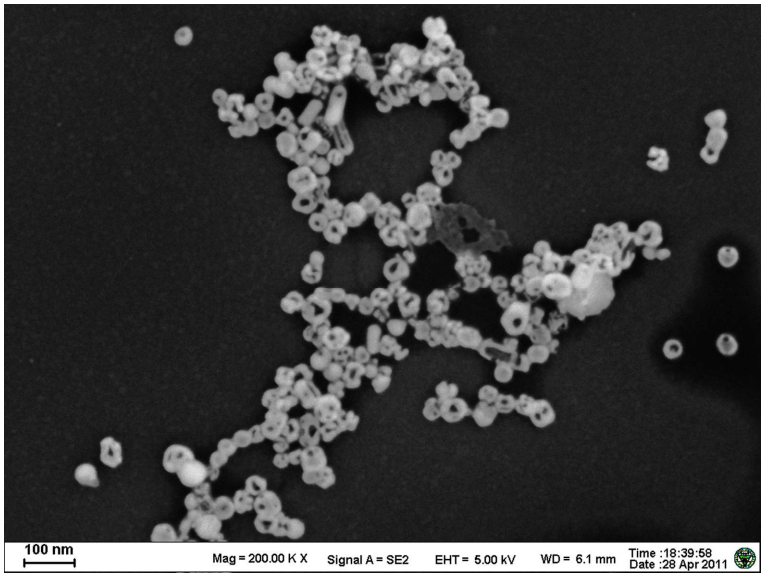


Figure S4: SEM image of 40nm hollow Au nanoshells.

Figure S5: mean size and ζ potential of 10nm Au nanoparticulate aggregates

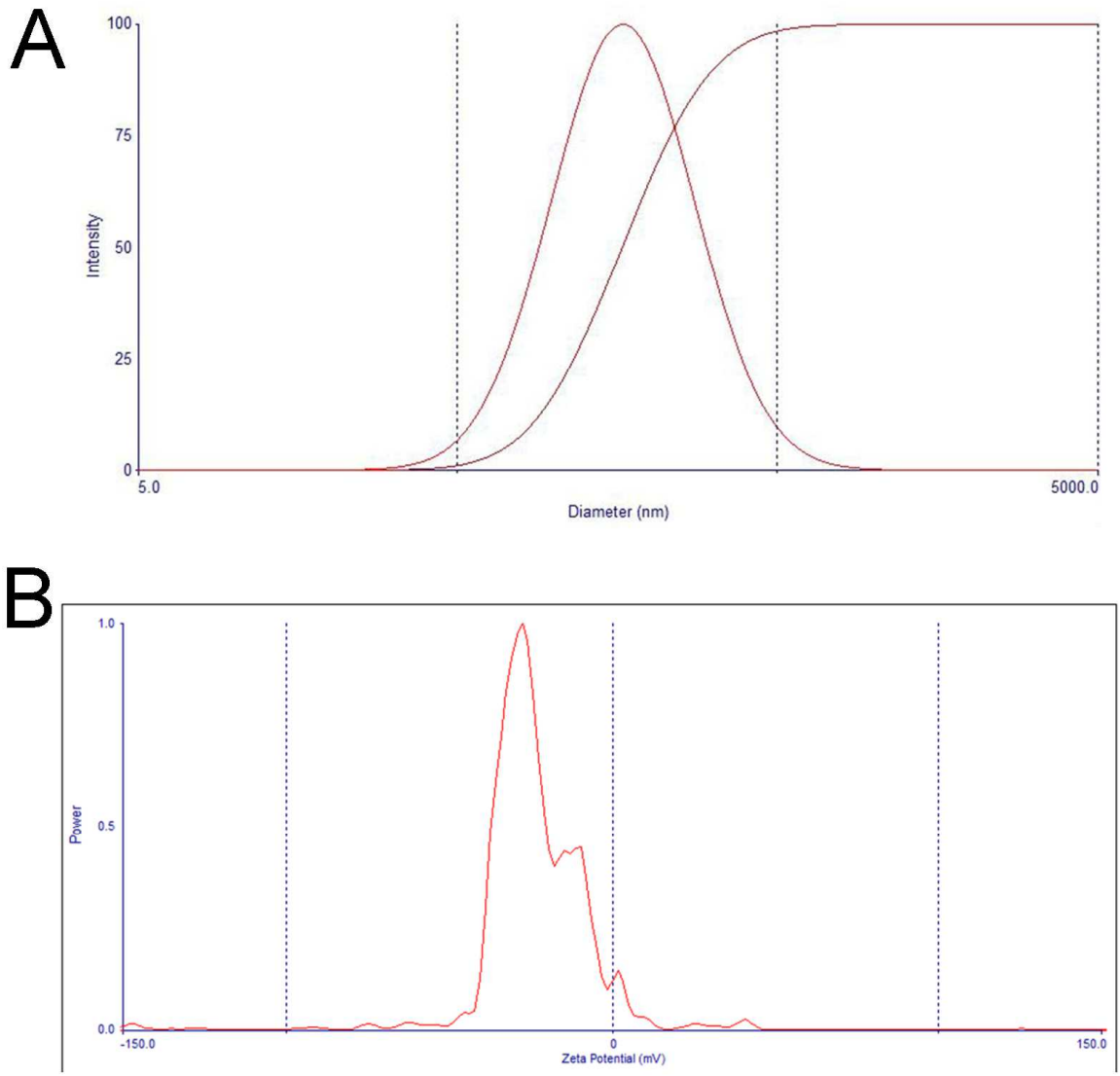


Figure S5: **A**, mean size of 10 nm colloidal gold aggregates characterized by DLS. **B**, ζ potential of 10nm Au nanoparticulate aggregates.

Figure S6: the morphological images of gold nanoshells with different concentrations after natural drying

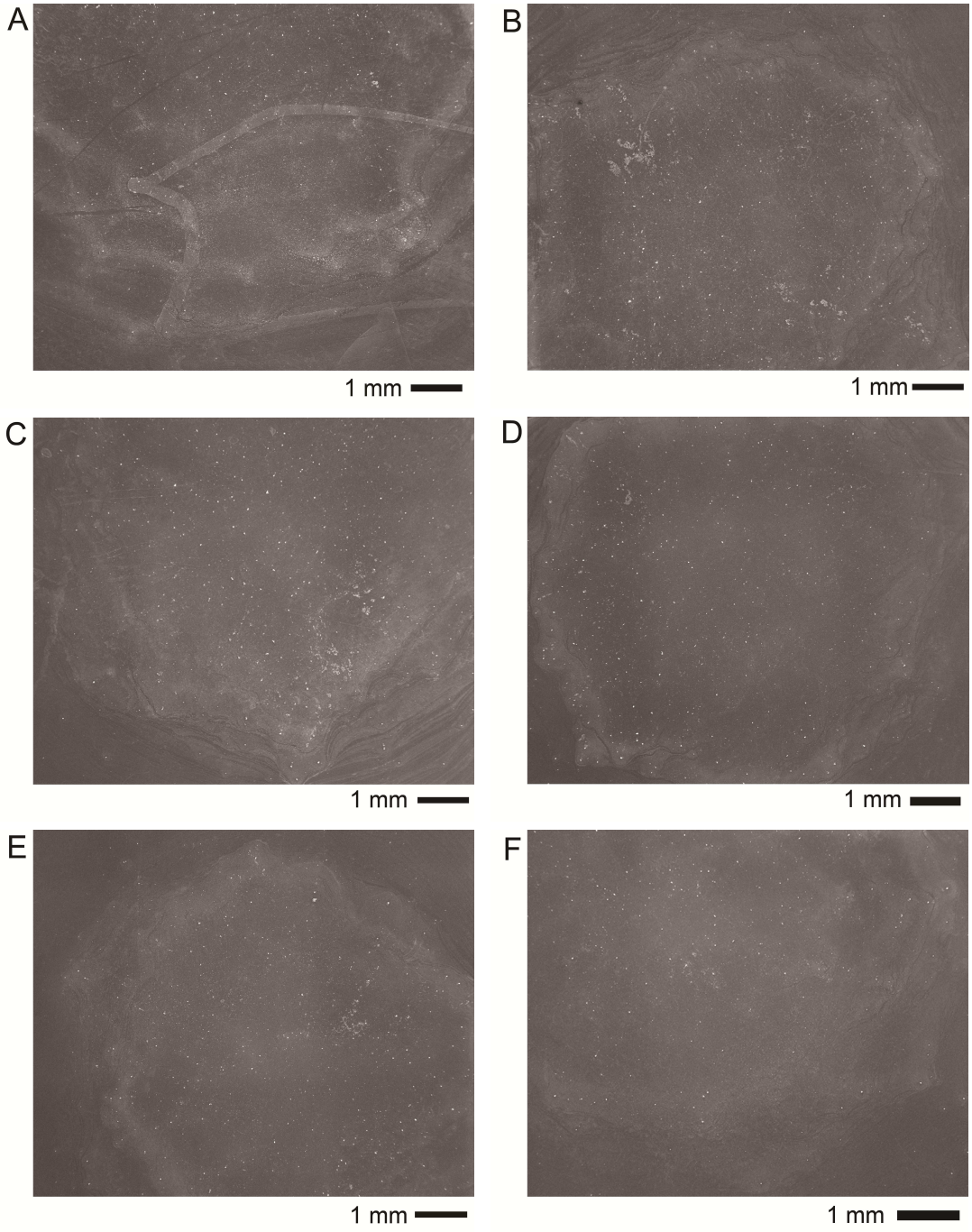


Figure S6: the morphological images of gold nanoshells with different concentrations after natural drying. **A~F**: 66.7μg/ml, 33.4μg/ml, 22.3μg/ml, 16.7μg/ml, 13.4μg/ml and 11.1μg/ml, respectively.

Figure S7: the pattern formation of gold nanorods mediated by the alternating magnetic field

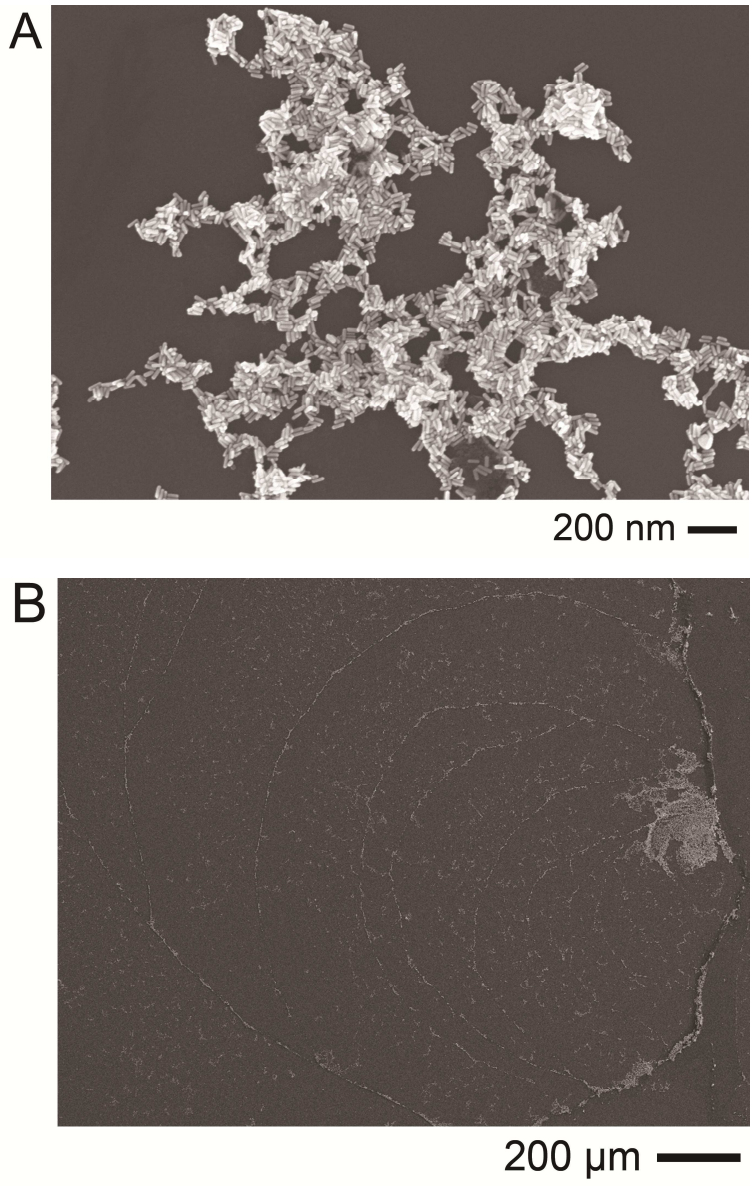


Figure S7: the pattern formation of gold nanorods mediated by the alternating magnetic field. **A**, the as-synthesized Au nanorods. **B**, the vortex-like pattern after the treatment of 100KHz alternating magnetic field.

Movie S1: http://dl.dropbox.com/u/53669185/Mov.%20S1.avi.

Movie S2: http://dl.dropbox.com/u/53669185/Mov.%20S2.avi.