

ELECTRONIC SUPPLEMENTARY INFORMATION

Gold Clusters-Loaded Dendritic Nanosilica: Single Particle Luminescence and Catalytic Properties in the Bulk

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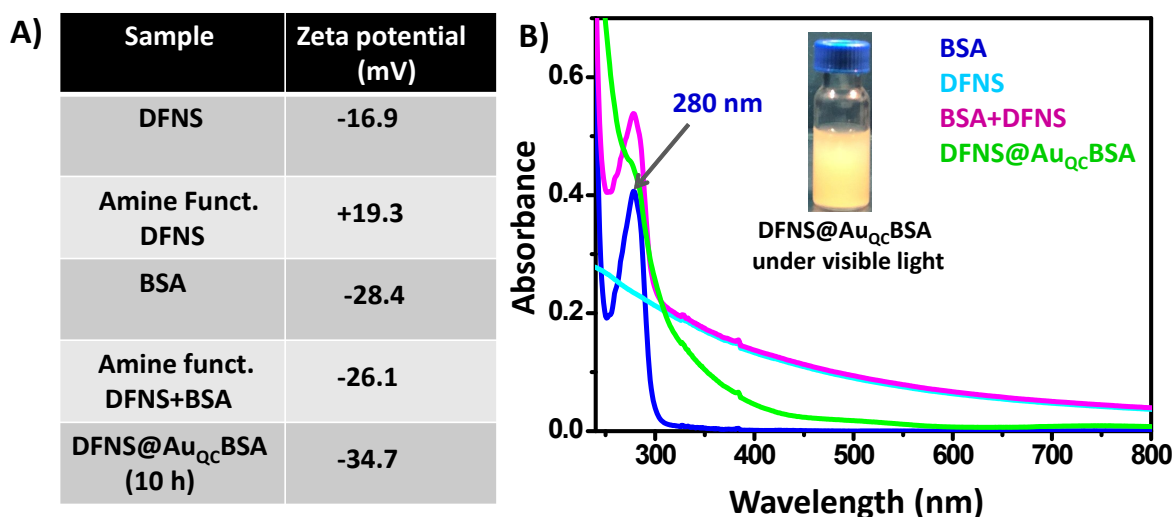


Fig. S1 (A) Comparative Zeta potential values of DFNS@Au_{QC}BSA and its related systems. (B) UV-Vis absorption spectra of DFNS@Au_{QC}BSA showing the synthesis of cluster on DFNS surface. The spectra were collected using water as the solvent. Inset shows the photograph of DFNS@Au_{QC}BSA under visible light.

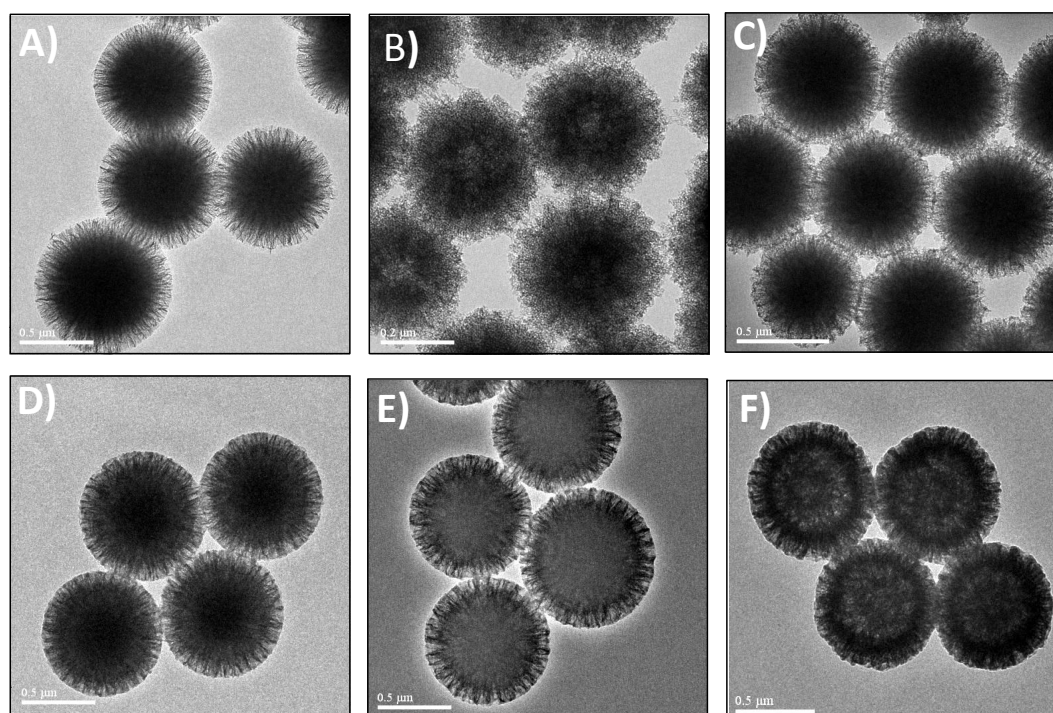


Fig. S2 HRTEM images showing the evolution of DFNS@Au_{QC}BSA structure. A) DFNS, (B) DFNS, and (C) DFNS+BSA at alkaline pH. HRTEM images of DFNS+BSA+HAuCl₄ at

alkaline pH after (D) 4 h, (E) 6 h, and (F) 10 h of the reaction. The hybrid structure was obtained after 10 h of reaction.

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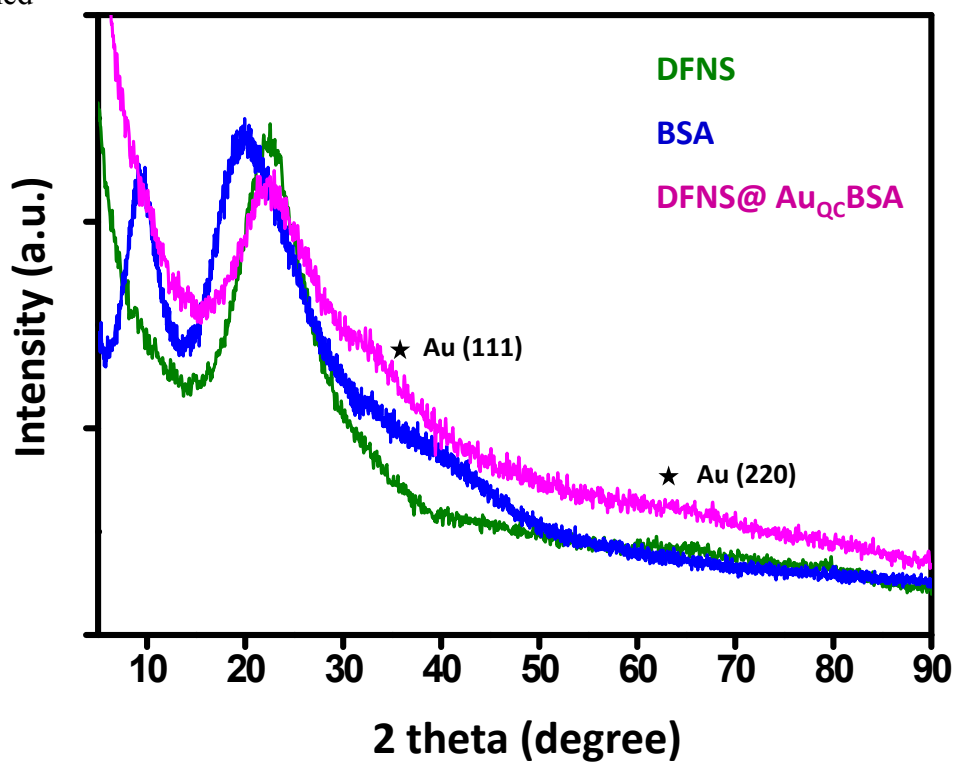


Fig. S3 Powder X-ray diffraction patterns of DFNS, BSA and DFNS@Au_{QC}BSA.

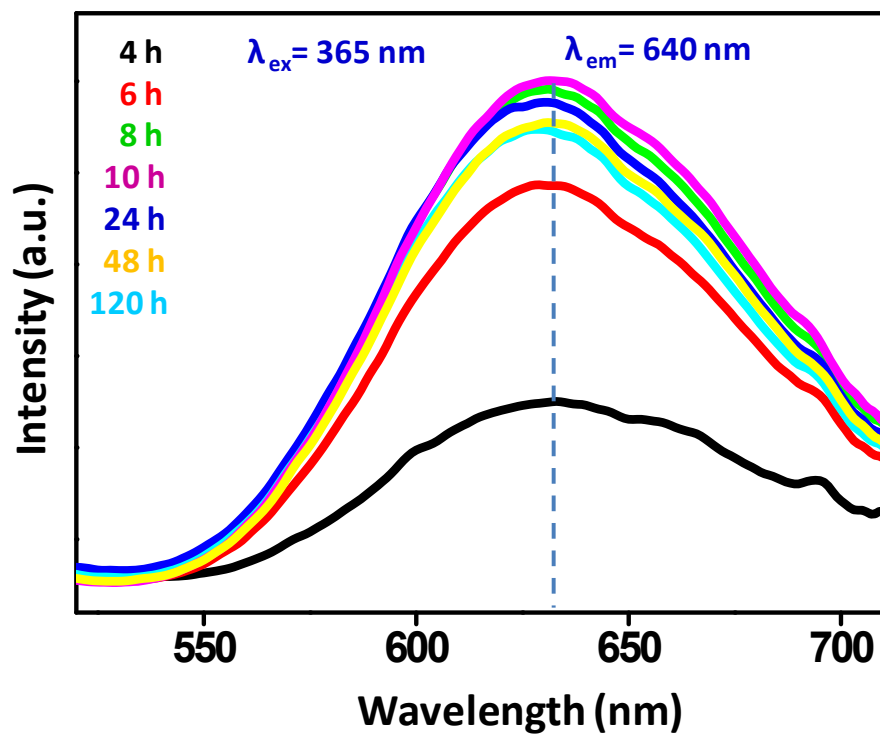


Fig. S4 Time dependent PL spectra during the synthesis of DFNS@Au_{QC}BSA. Luminescence started to appear after 4 h of the reaction and PL spectrum has taken up to 5 days. The emission maximum was found ~640 nm when excited at 365 nm.

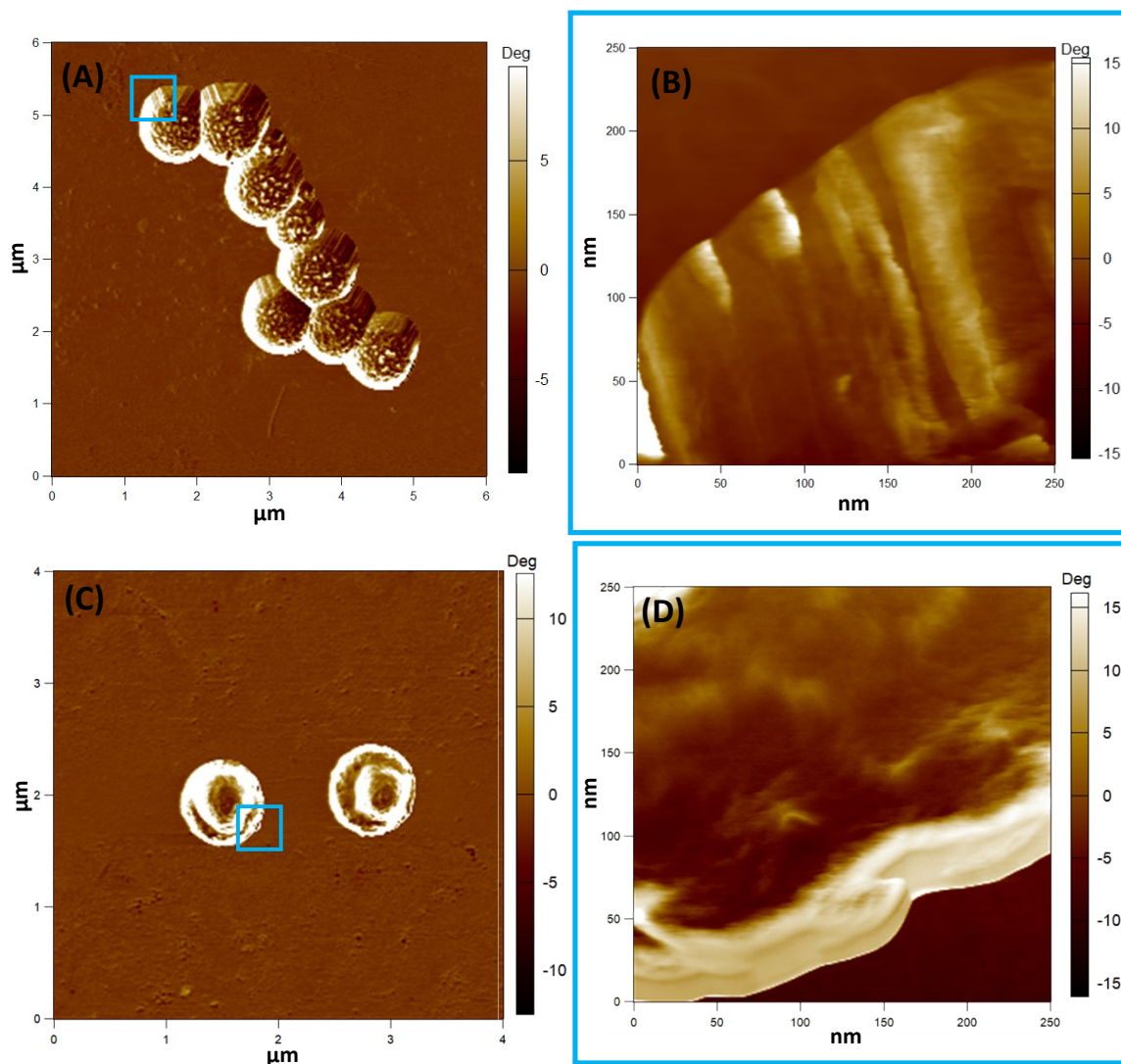


Fig. S5 AFM large area phase imaging of (A) DFNS and (C) DFNS@Au_{QC}BSA. The regions marked in the A and C are shown in image B and D, respectively. The high resolution image D (DFNS@Au_{QC}BSA), showing the clear contrast and morphological difference than the DFNS.

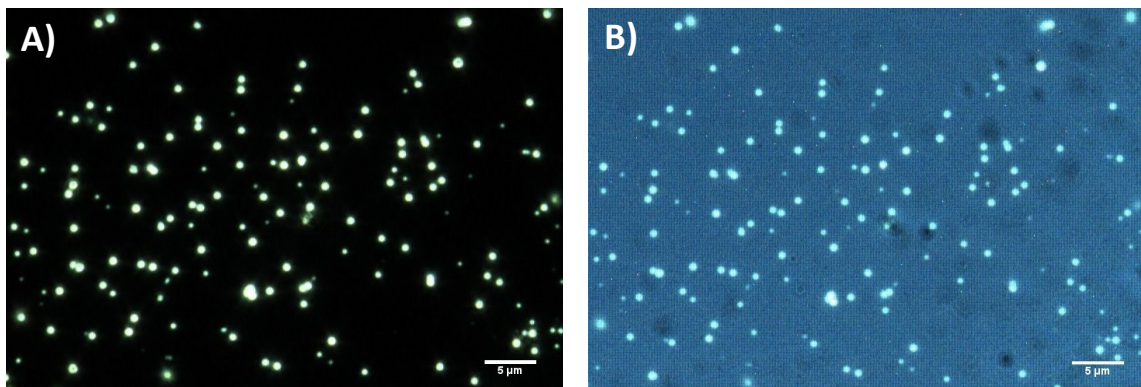


Fig. S6 A large area optical (A) and the corresponding fluorescence images of the parent DFNS (B). Scale bars in A and B are 5 μm .

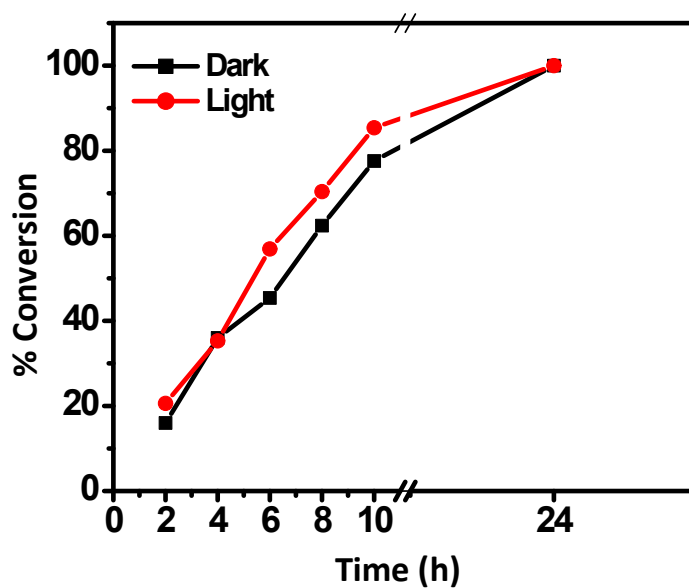


Fig. S7 The effect of light on the conversion of dimethylphenylsilane to dimethylphenylsilanol at 45 $^{\circ}\text{C}$. (Error in the catalytic measurements is $\pm 5\%$).

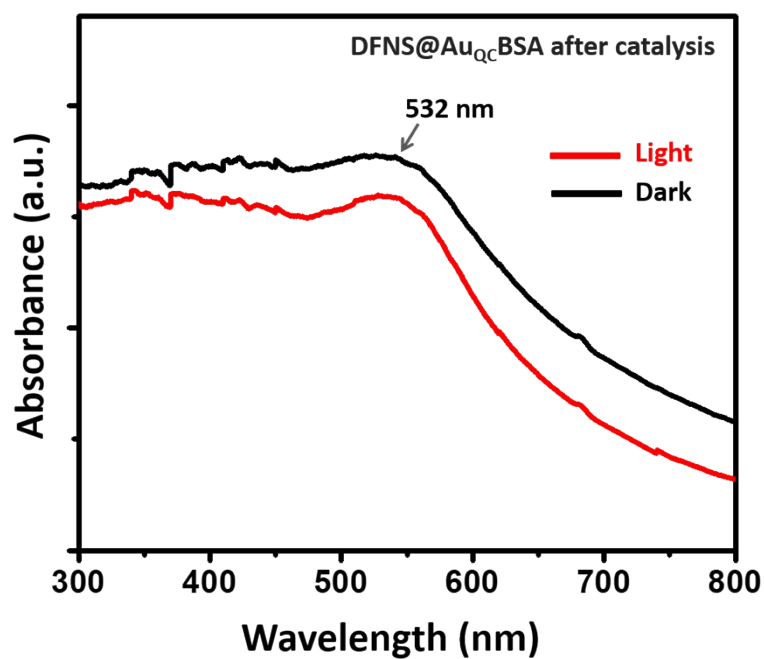


Fig. S8 UV-Vis absorption spectra of DFNS@Au_{QC}BSA in presence (red trace) and absence (black trace) of light, after catalytic reaction showing the presence of plasmonic peak around 532 nm.