Supporting Information

Cyclodextrin Modified Microgels as "Nanoreactor" for the Generation of Au Nanoparticles with Enhanced Catalytic Activity

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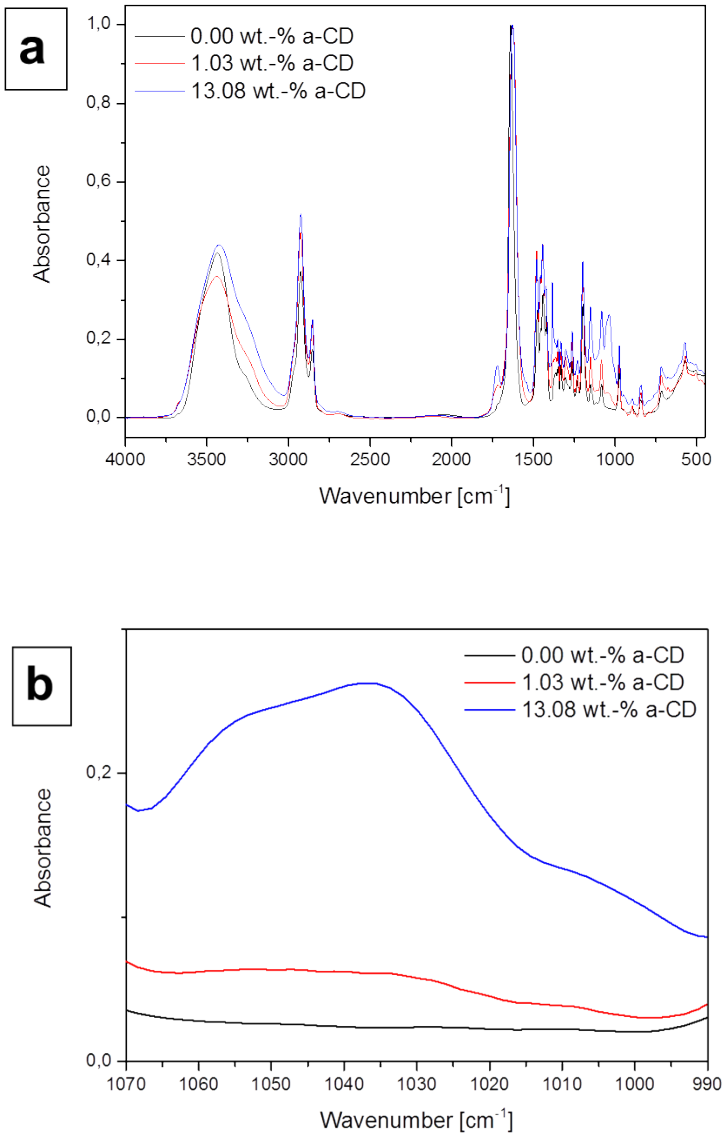

Figure S1. Infrared spectra of pure PVCL, PVCL-α-CD(1.03 wt.-%) and PVCL-α-CD(13.08 wt.-%), a) whole spectrum, b) absorbance of C-O-C group of cyclodextrin around 1034 cm^{-1}.

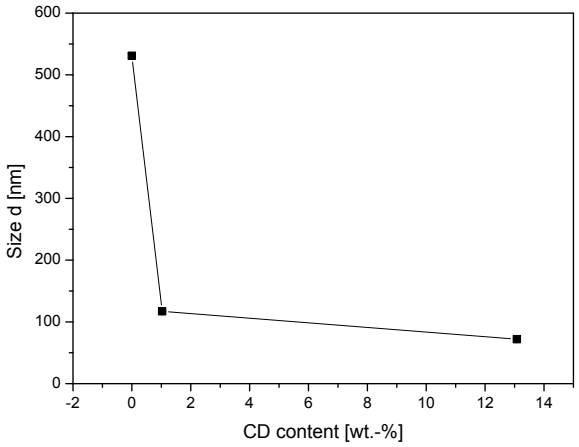

Figure S2. Size dependence of PVCL microgels on the α-CD content (measurement at 20 °C).

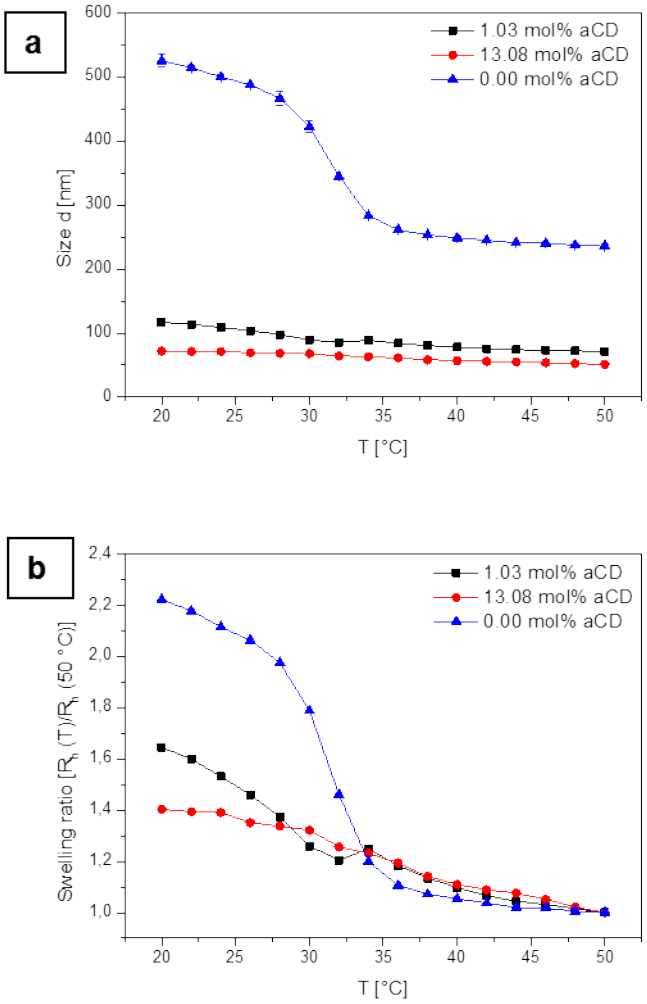

Figure S3. a) Temperature dependent DLS measurement of pure PVCL, PVCL-α-CD(1.03 wt.-%) and PVCL-α-CD(13.08 wt.-%), b) Swelling ratio of pure PVCL, PVCL-α-CD(1.03 wt.-%) and PVCL-α-CD(13.08 wt.-%).

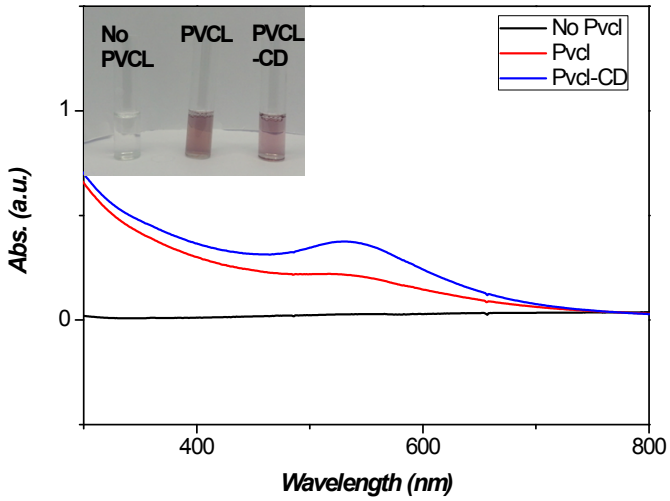

Figure S4. UV-vis spectras of the $HAuCl_4$ and NaOH mixture solutions with different amounts of PVCL and α-CD inside. The insert image is the photograph of the $HAuCl_4$ and NaOH mixture solutions with different amounts of PVCL and α-CD inside.

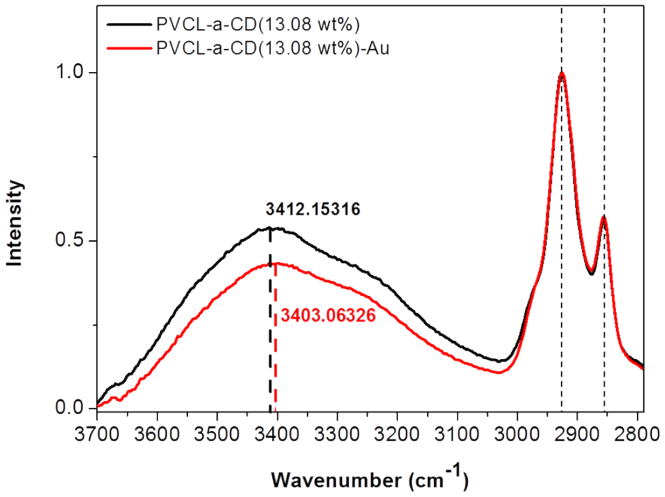

Figure S5. Infrared spectra of PVCL-α-CD(13.08 wt.-%) and PVCL-α-CD(13.08 wt.-%)-Au in the range of 3700-2750 cm^{-1}.

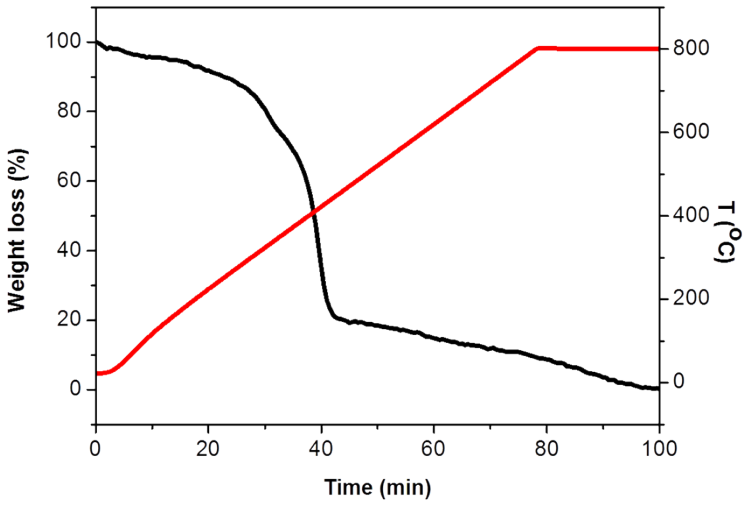

Figure S6. TGA spectra of PVCL-α-CD (13.08 wt.-%) microgels.

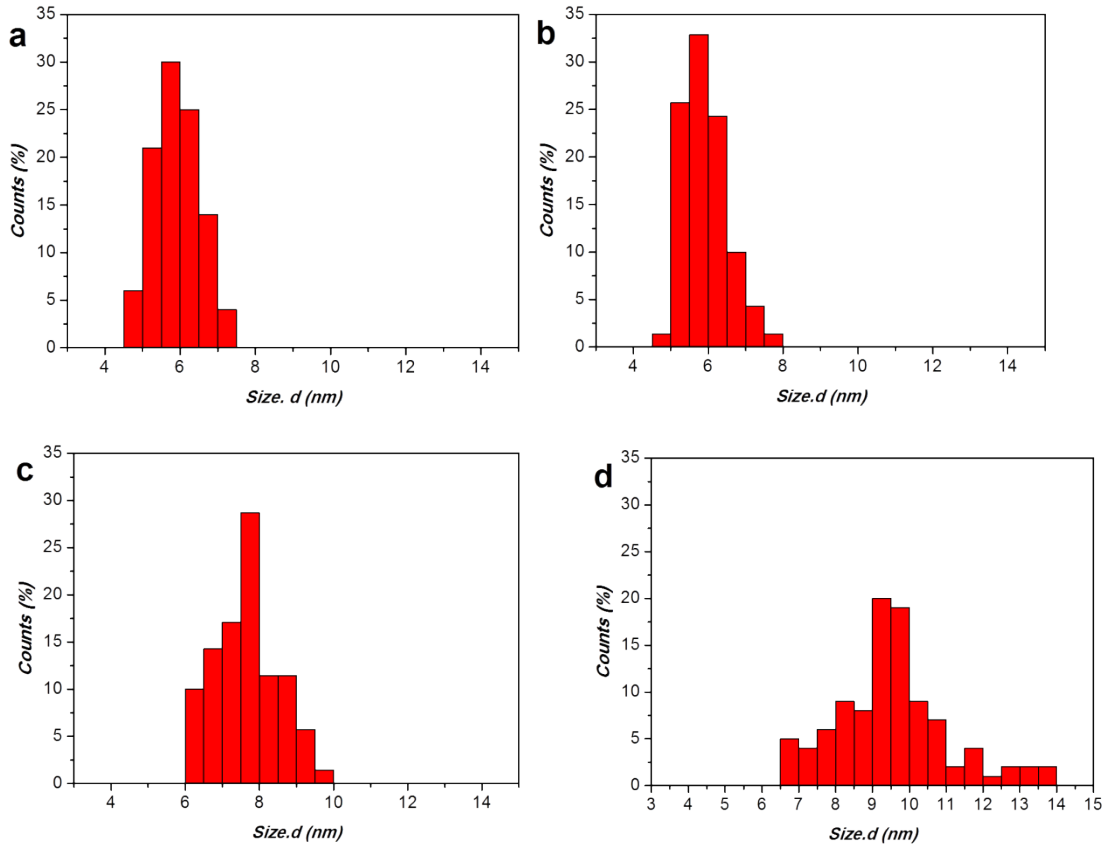

Figure S7 . Size distribution of Au nanoparticles with different amount of $HAuCl_4$ according to the Table 1: (a) 0.1 ml; (b) 0.2 ml; (c) 0.3 ml; (d) 0.4 ml.

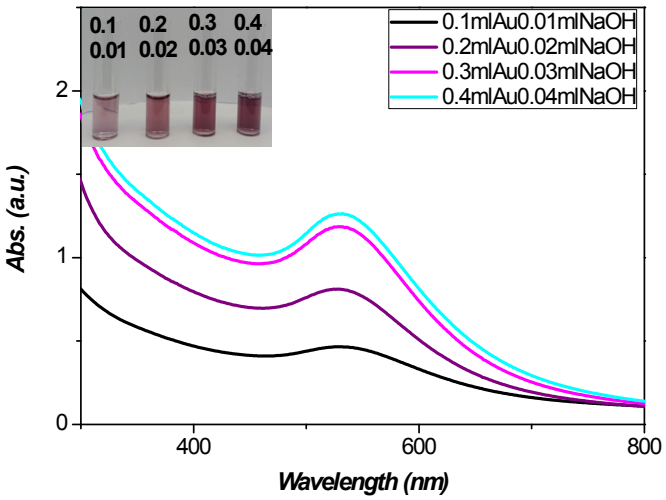

Figure S8. UV-vis spectra of PVCL-α-CD-Au microgel particles solutions with different amounts of $HAuCl_4$. The insert image is the photograph of the PVCL-α-CD-Au microgel particle solutions with different amount of $HAuCl_4$.

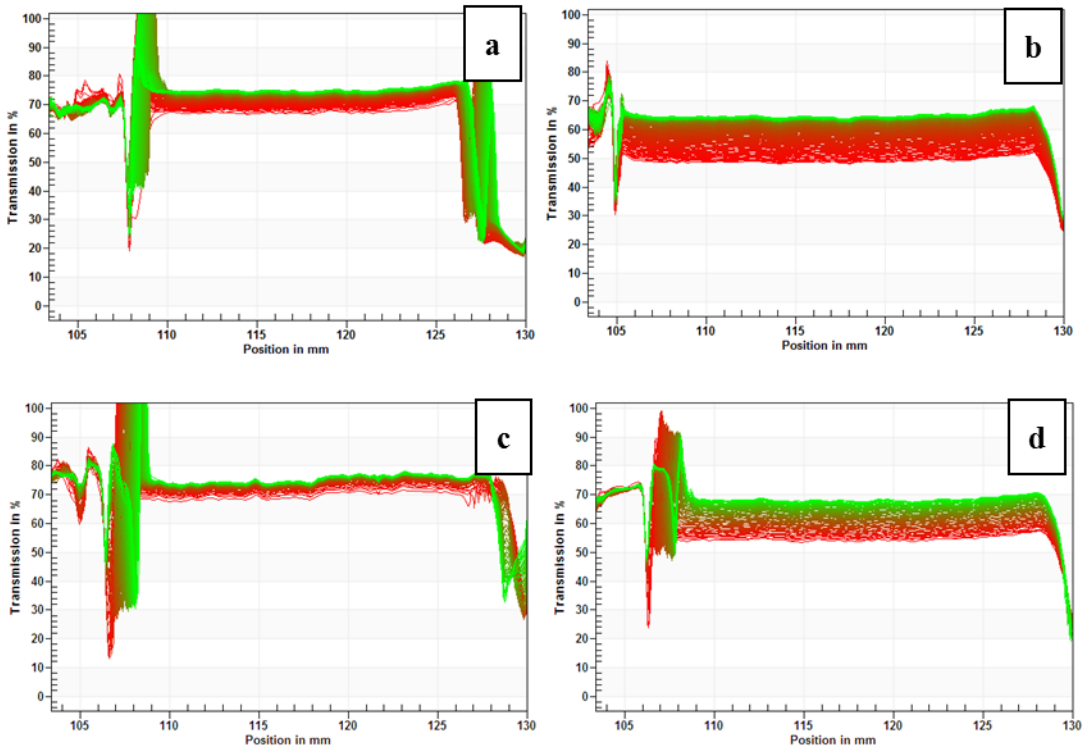

Figure S9. Raw data of LUMiSizer measurements of PVCL-α-CD(1.03 wt.-%) without (a) and loaded with Au-nanoparticles (b) and of the pure and loaded samples of PVCL-α-CD(13.08 wt.-%) (c and d).

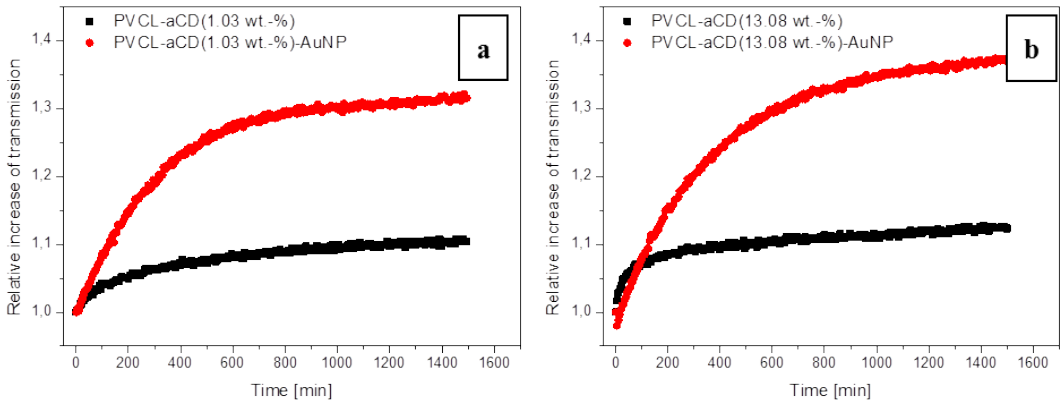

Figure S10. Relative increase of transmission of PVCL-α-CD(1.03 wt.-%) (a) and PVCL-α-CD(13.08 wt.-%) (b) without and loaded with Au-nanoparticles.

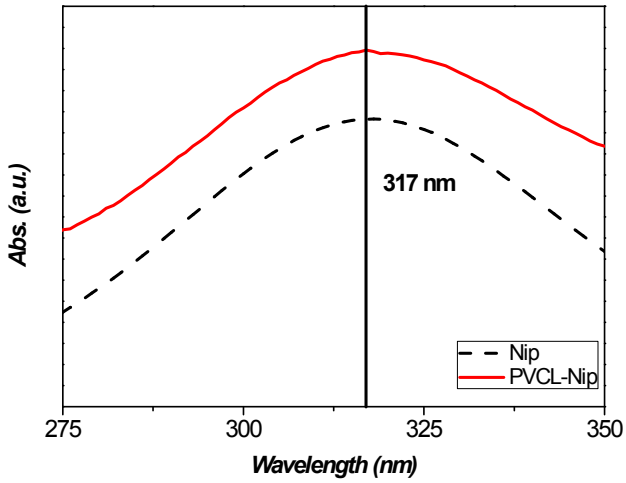

Figure S11. UV-vis spectra of Nip mixed with PVCL (solid line) and pure Nip (dash line).

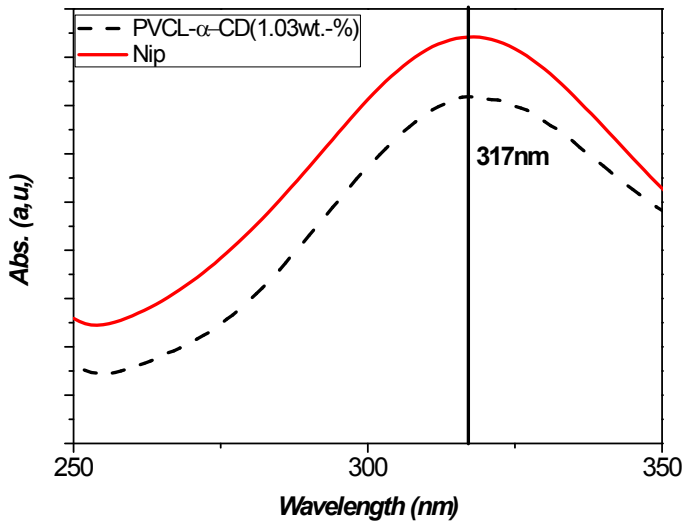

Figure S12. UV-vis spectra of Nip mixed with PVCL-α-CD(1.03 wt.-%) microgels (dash line) and pure Nip (solid line).

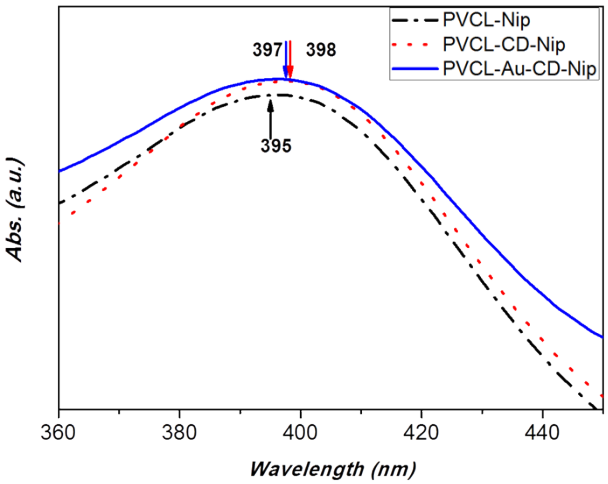

Figure S13. UV-vis spectra of Nip mixed with PVCL (dash dot); PVCL-α-CD(13.08 wt.-%)-Au microgels(solid line); PVCL-α-CD(13.08 wt.-%)microgels(dotted line). Concentrations: Nip: 10^{-5}mol/L; microgels: 0.203mg/ml; pH=10.

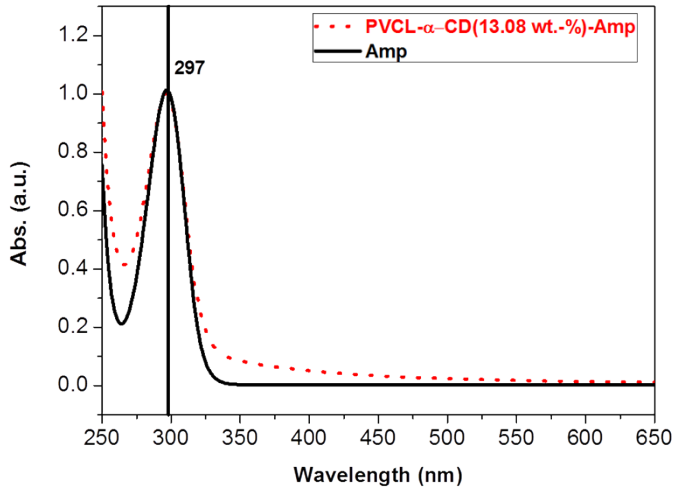

Figure S14. UV-vis spectra of Amp mixed with PVCL-α-CD (13.08 wt.-%) (dot line) and pure Amp (solid line).

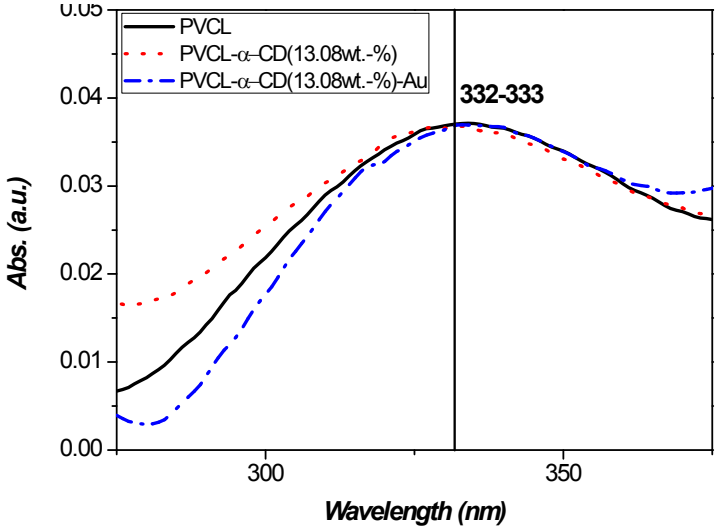

Figure S15. UV-vis absorption spectra of DMNip reduced by sodium borohydride using PVCL-α-CD(13.08 wt.-%)-Au particles as catalyst.

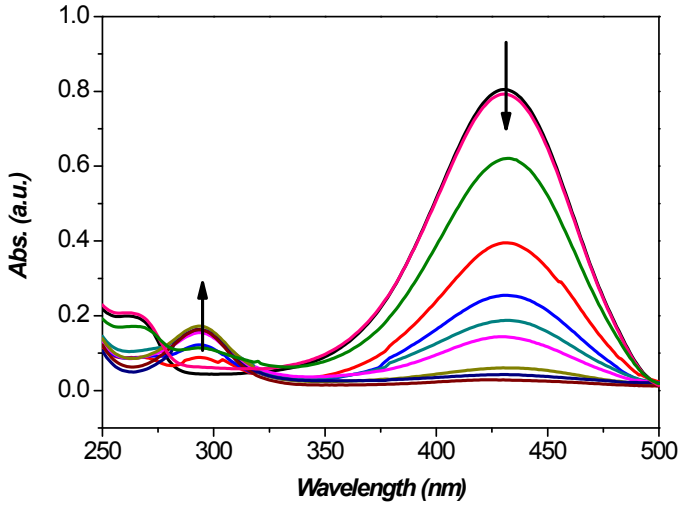

Figure S16. The UV-vis spectra of DMNip: Black, mix with PVCL microgels; Red, mix with PVCL-α-CD(13.08 wt.-%) microgels; Blue, mix with PVCL-α-CD(13.08 wt.-%)-Au microgels. Concentrations: DMNip: 10^{-5}mol/L; microgels: 0.203mg/ml.

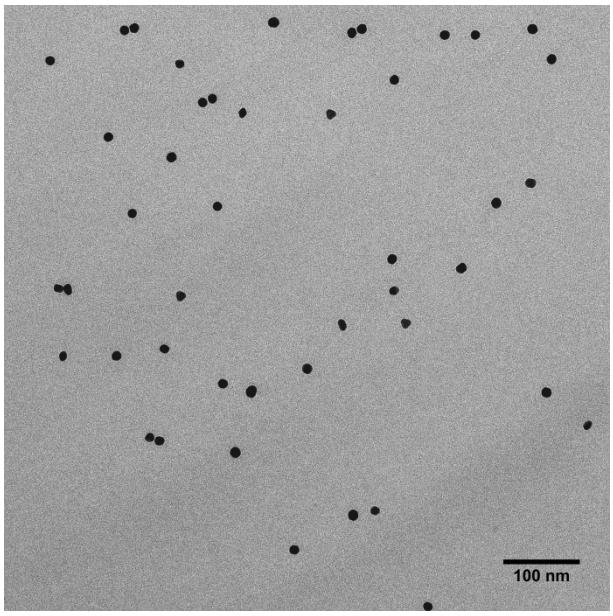

Figure S17. The TEM image of CTAB-stabilized Au nanoparticles with radius of around 5 nm.

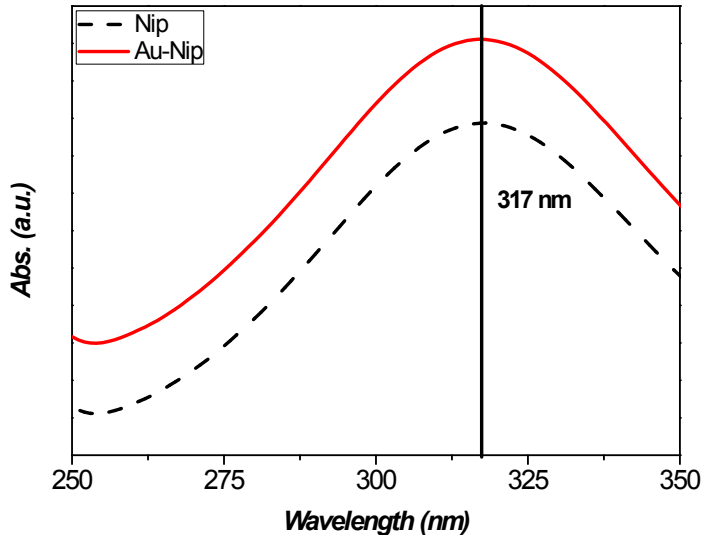

Figure S18. The UV-vis spectra of 4-nitrophenol: Black, pure 4-nitrophenol; Red, mix with CTAB-stabilized Au nanoparticles with radius of around 5 nm.