Supporting Online Material for

Controllable incorporation of Ag and Ag-Au nanoparticles in carbon spheres for tunable optical and catalytic properties

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Supplementary Materials

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Figure captions (Figure S1 to S6)

Fig. S1 FTIR spectrum of the as-prepared CSs.

Fig. S2 TEM images of a product obtained after microwaving a suspension of CSs in a $HAuCl_4$ solution ($C_{HAuCl4} = 2\times10^{-4}$ mol/L, t_I = 4 h, and MW power = 140 W) in the presence of PVP. Au NPs only formed on the surfaces of the CSs under these conditions (without previous Ag doping).

Fig. S3 UV-Vis absorption spectra of suspension of bare CSs in aqueous solution (black curve) and the product form a microwave synthesis at 140 W for 10 min *without* PVP and even without microwaving (blue curve).

Fig. S4 SEM-EDS spectrum recorded from the product shown in Fig. 6e.

Fig. S5 XPS survey spectra (a) and XPS Au 4*f* signals (b) of Ag-C (red line) and Ag-Au-C (blue line) composite particles shown in Fig. 1b and 5a.

Fig. S6 High resolution XPS spectra of Ag 3*d* (a) and Au 4*f* (b) of the Ag-Au-C composites after being used three times as a catalyst reducing 4-NP.

Fig. S1

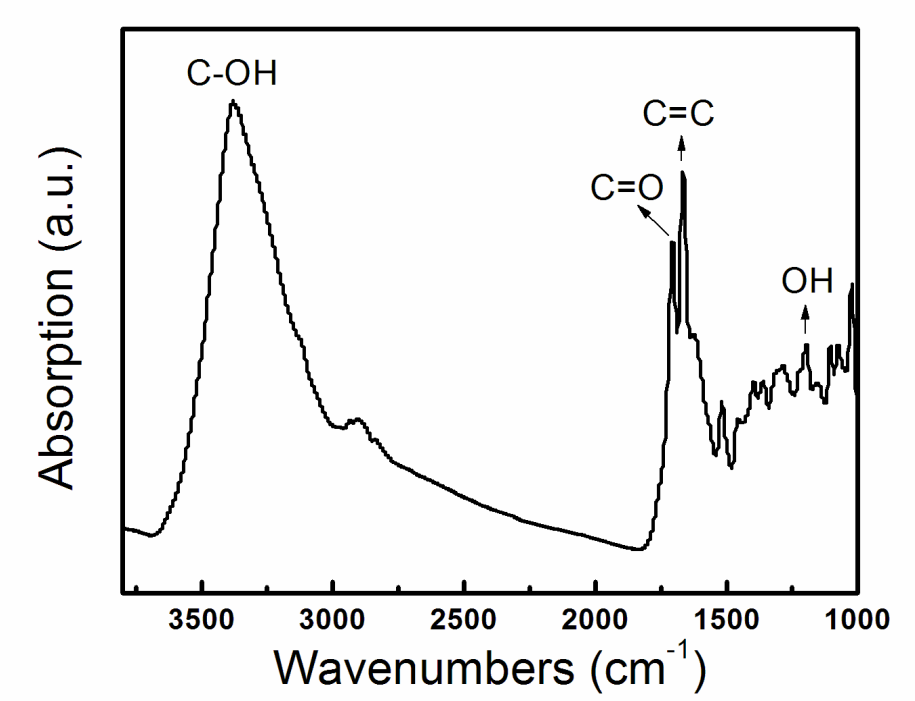

Fig. S1 FTIR spectrum of the as-prepared CSs

Fig. S2

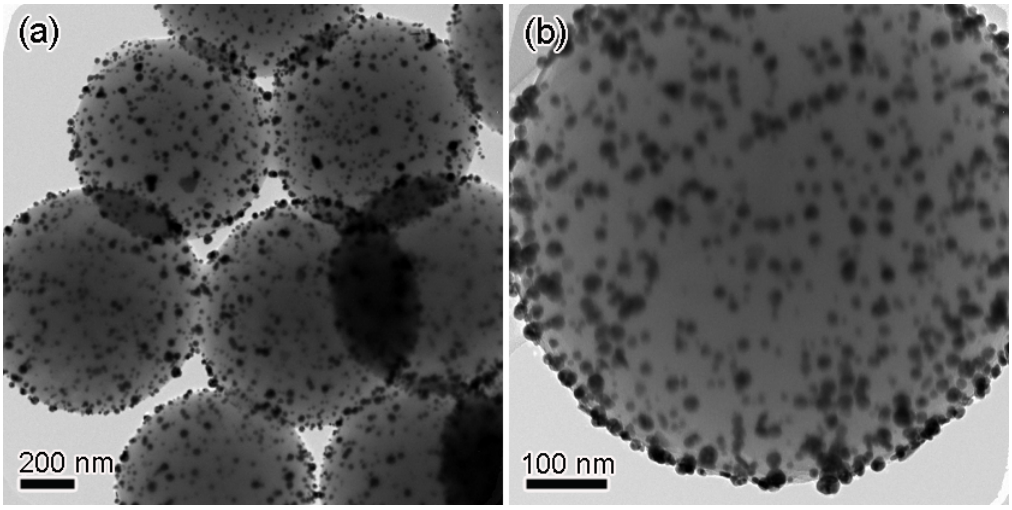

Fig. S2 TEM images of a product obtained after microwaving a suspension of CSs in $HAuCl_4$ solutions ($C_{HAuCl4} = 2\times10^{-4}$ mol/L, t_I = 4 h, and MW power $<P>$ = 140 W) in the presence of PVP. Au NPs only formed on the surfaces of the CSs under these conditions (without previous Ag doping).

Fig. S3

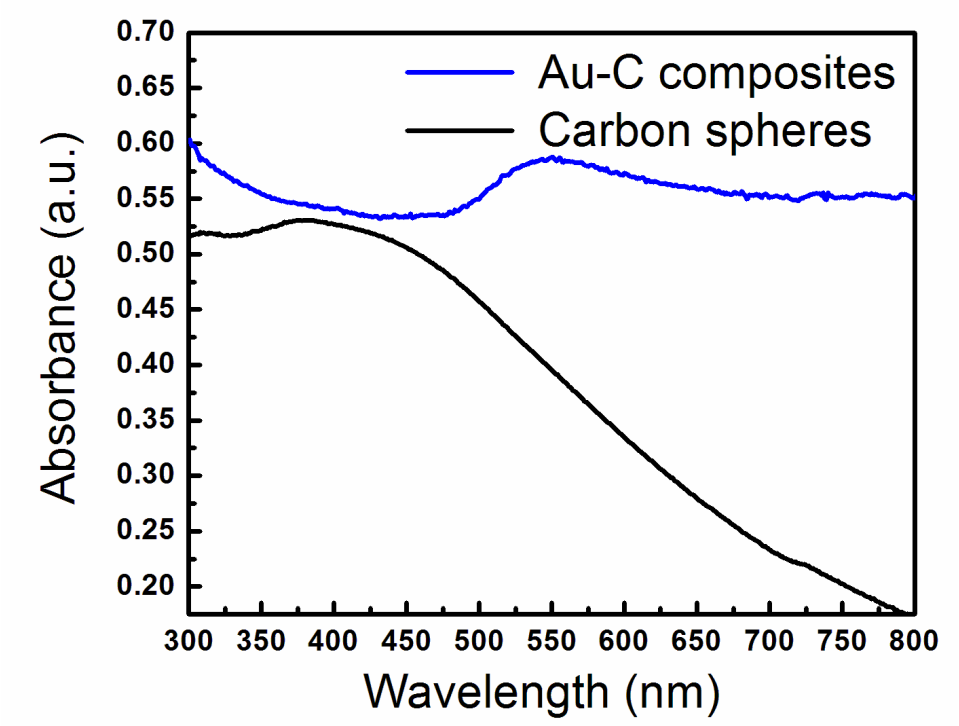

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Fig. S4

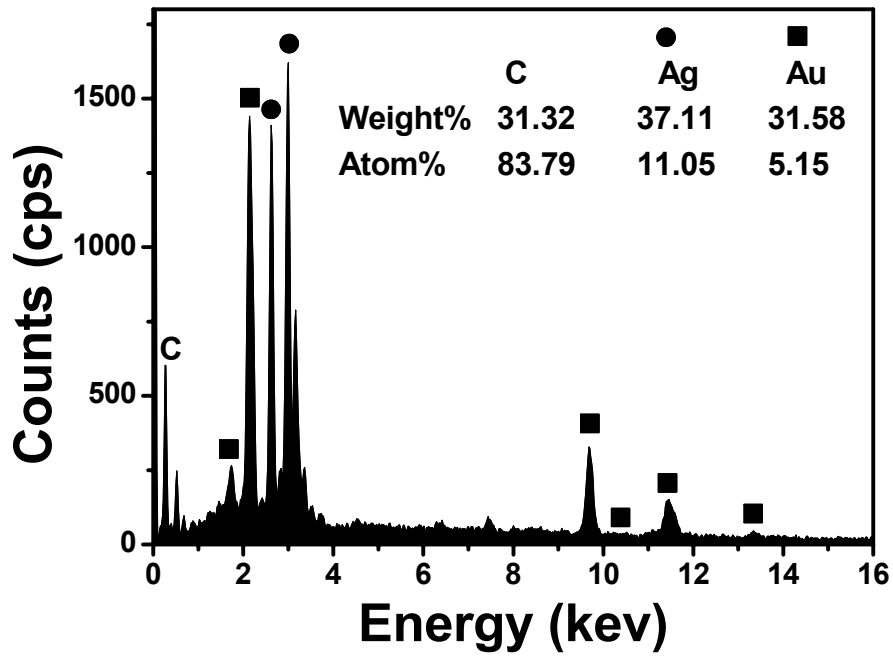

Fig. S4 SEM-EDS spectrum recorded from the product shown in Fig. 6e.

Fig. S5

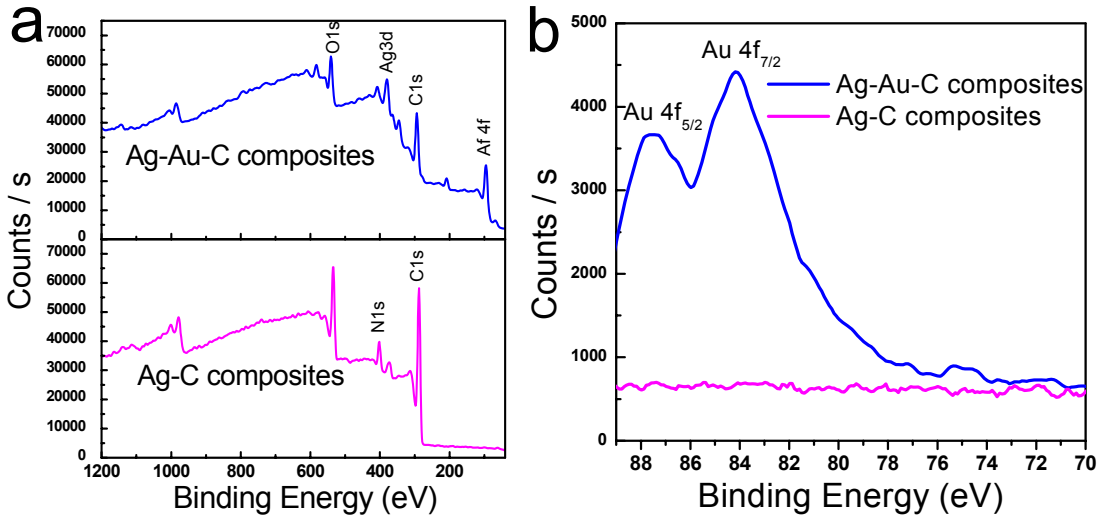

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Fig. S6

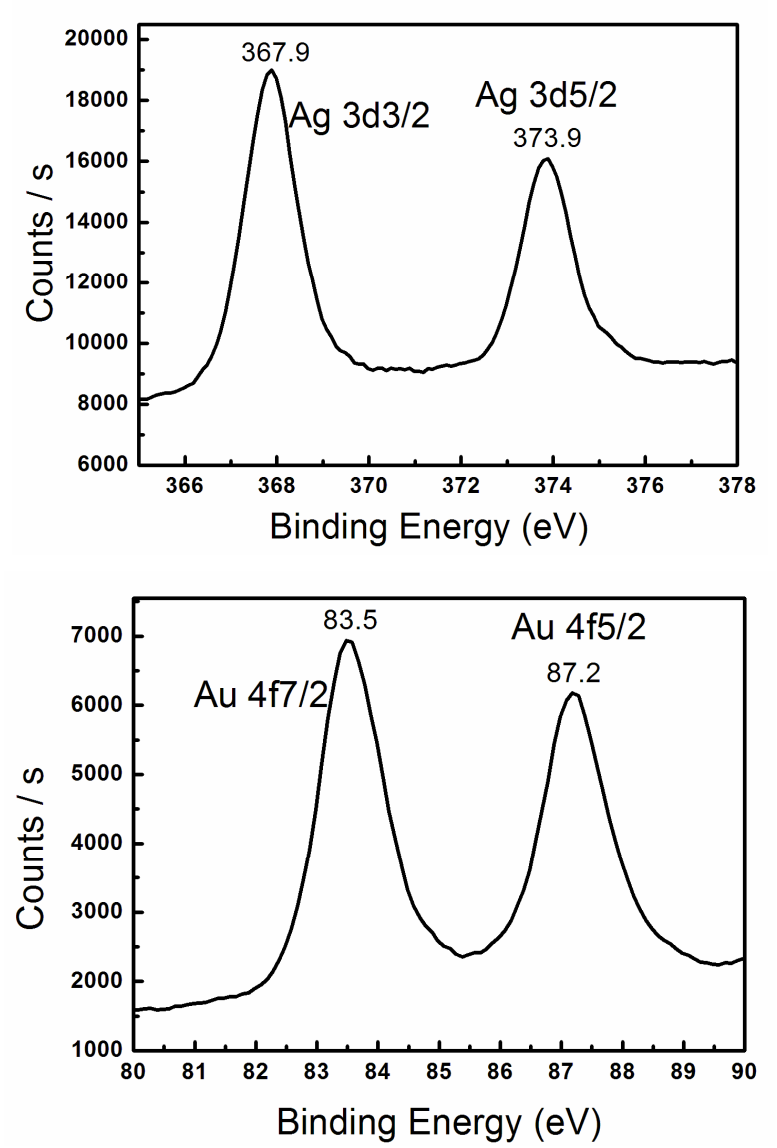

Fig. S6 High resolution XPS spectra of Ag 3*d* (a) and Au 4*f* (b) of the Ag-Au-C composites after being used three times as a catalyst reducing 4-NP.