Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information

Gold Nanoparticle Embedded in Silica Hollow Nanospheres Induced by Compressed CO_2 as an Efficient Catalyst for Selective Oxidation

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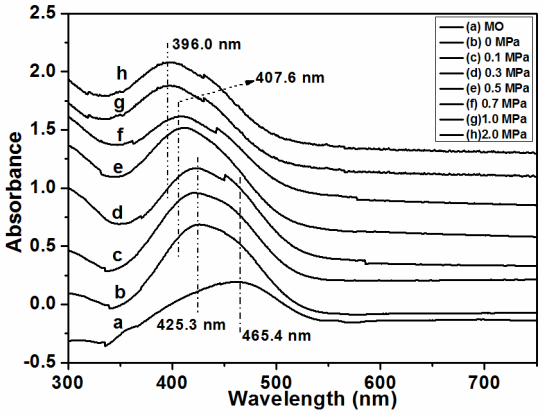

Fig. S1 UV/Vis spectra of MO in (a) pure water; (b)-(g) F127 aqueous solutions under the different CO_2 pressures. The concentration of F127 in aqueous solution was 1.6 wt %, and K_2SO_4 0.33 mol L^{-1}, respectively.

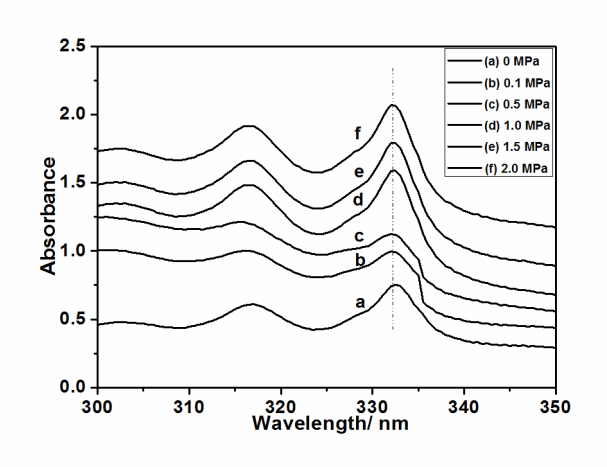

Fig. S2 UV/Vis spectra of 10 μmol/L pyrene in F127 and aqueous solutions under the different CO_2 pressures. The concentration of F127 in aqueous solution was 1.6 wt%, and K_2SO_4 0.33mol L^{-1}, respectively.

Table S1 Physicochemical properties of hollow silica hollow nanospheres .

sample	BET Surface area (m^2 g^{-1})	BJH Pore diameter[a] (nm)	Pore volume (cm^3 g^{-1})
SiO_2-S[b]	465.1	8.5	0.72
HS-CO_2-0.5	365.7	18.1	1.44
HS-CO_2-1.0	517.1	15.9	1.20
HS-CO_2-1.5	479.2	22.3	1.47
HS-CO_2-2.0	436.9	23.2	1.49

[a]Calculated by the BJH Adsorption average pore diameter, [b]SiO_2-S was obtained by using H_2SO_4 to tune the pH=3.6.

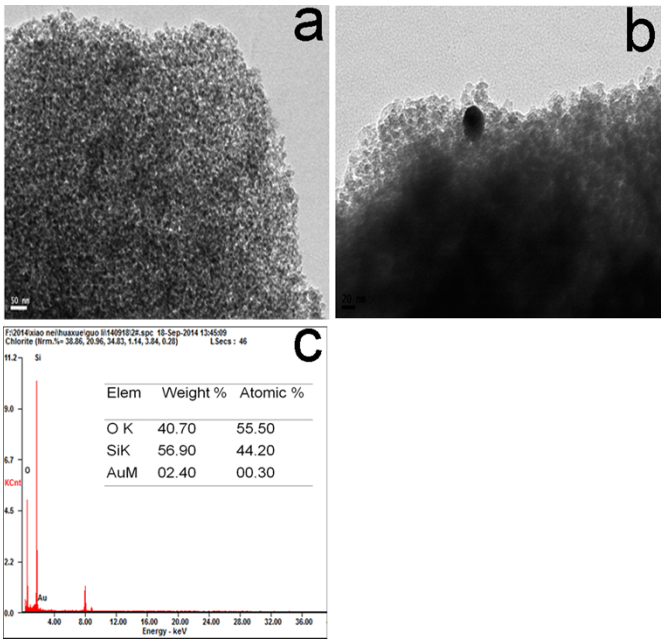

Fig. S3 (a) and (b) TEM images of Au/SiO_2, (c) EDX of Au/SiO_2.

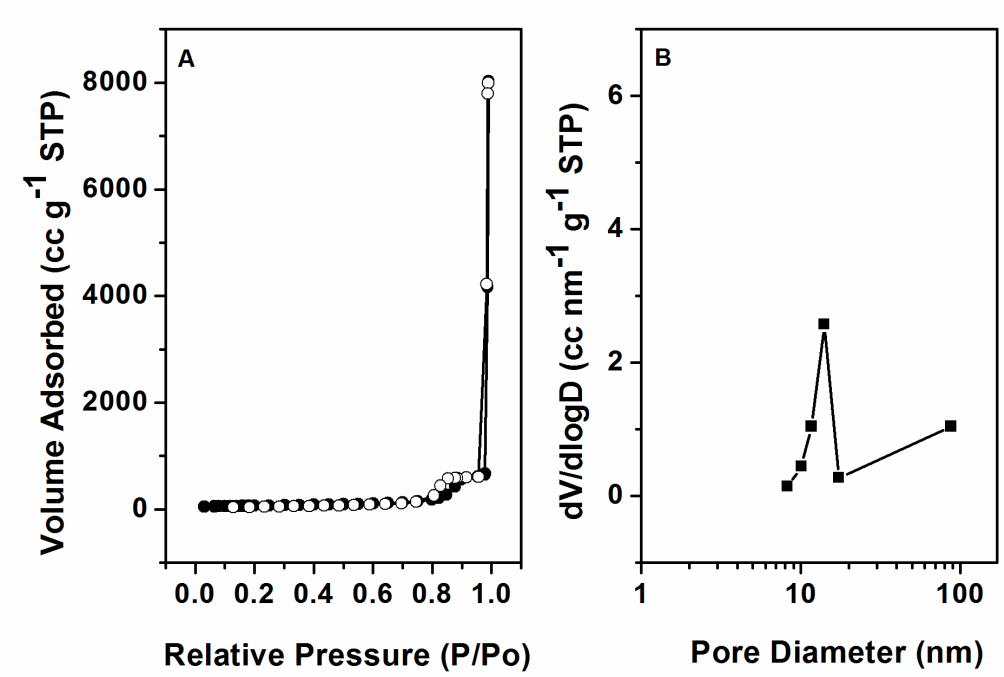

Fig. S4 (A) Nitrogen adsorption (●) and (○) desorption isotherms and (B) pore size distribution curves of Au/SiO_2.

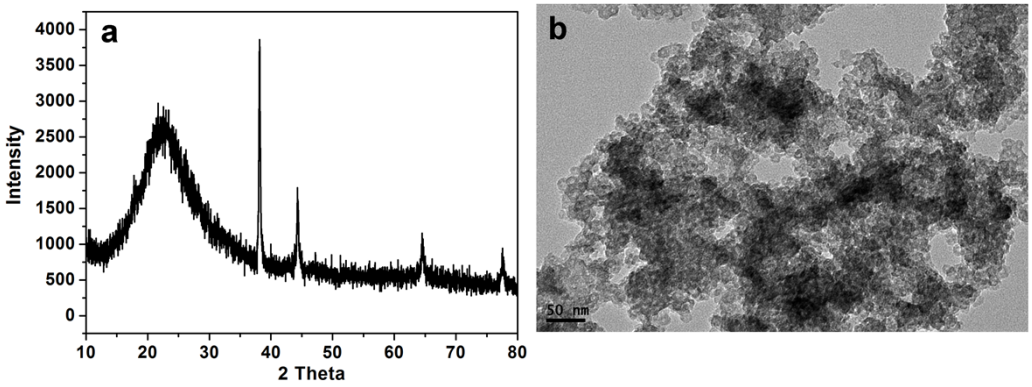

Fig. S5 (a) wide-angle XRD pattern and (b) TEM image of Au-1.7@HS-CO_2-1.

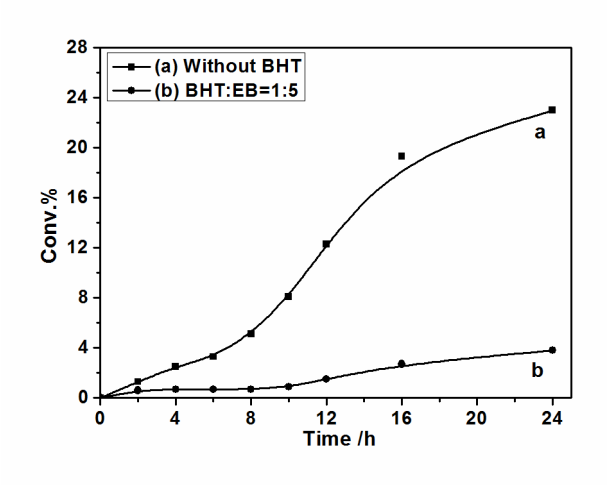

Fig. S6 Ethylbenzene selectively oxidation by Au@HS-CO_2-1 with or without BHT. (a) without BHT; (b) BHT:EB molar ration 1:5. Reaction conditions: ethylbenzene (5.65 mmol), TBHP (16.95 mmol), catalyst (25 mg), acetonitrile (2.5 ml), 353 K, 24 h under Nitrogen. The main side-product was 1-phenylethanol.