

Electronic Supplementary Information (ESI)

C-isolated Ag-C-Co Sandwich Sphere-structures and Their Highly Activity Catalysis Induced by Surface Plasmon Resonance

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Table S1. Saturation magnetization (M_s) and retentivity (M_r) as well as coercivity (H_c) of Ag-C-Co nanospheres, Ag-Co nanospheres and Co nanospheres.

Magnetic parameters	Ag-C-Co	Ag-Co	Co
M_s (emu/g)	31.833	27.623	140.84
M_r (emu/g)	1.3205	1.4100	10.4200
H_c (Oe)	109.95	111.17	137.07

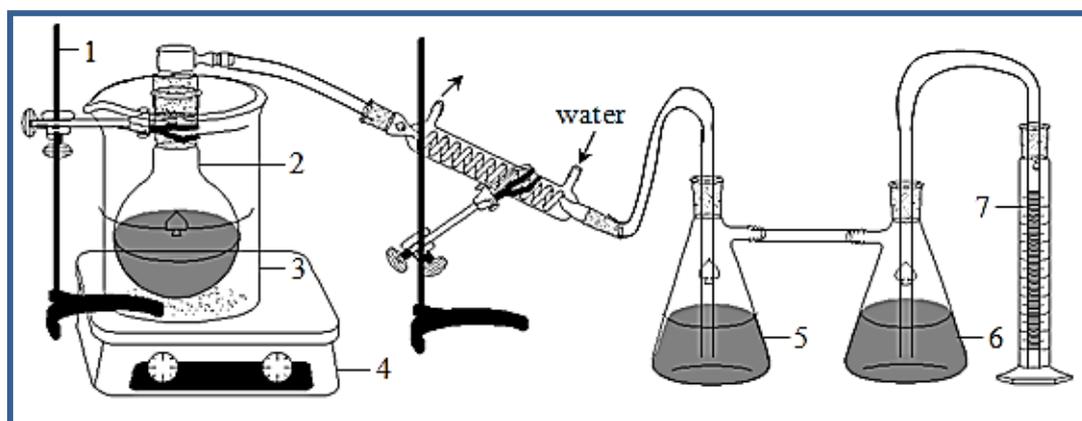


Figure S1. Simplified graphic of experimental devices for hydrogen generation from the hydrolysis reaction of NaBH₄ solution: 1. iron stand; 2. reactor flask; 3. water bath; 4. magnetic stirrer; 5. 98% concentrated H₂SO₄ solution; 6. water container; 7. measuring cylinder.

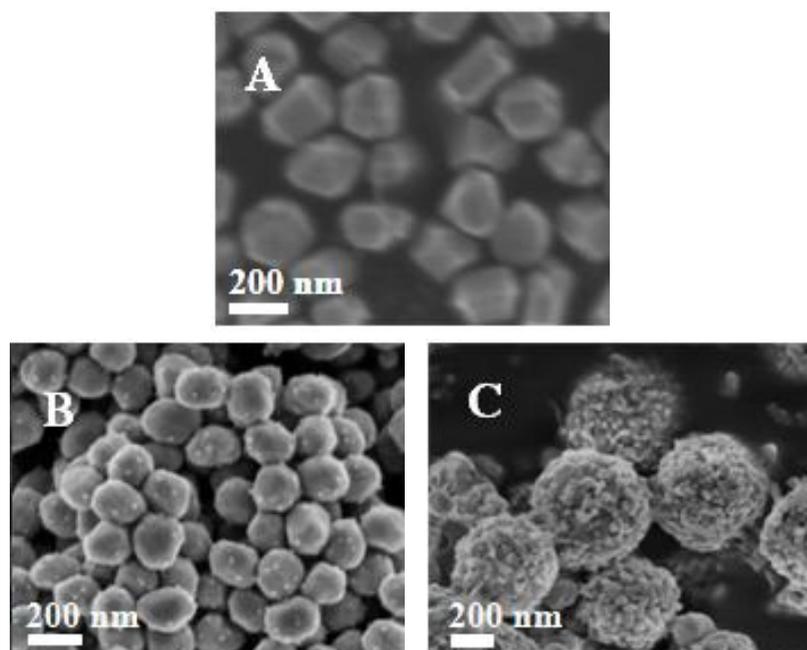


Figure S2. The SEM of Ag-C-Co nanospheres images obtained at reaction time of (A) 2 min, (B) 10 min and (C) 30 min.

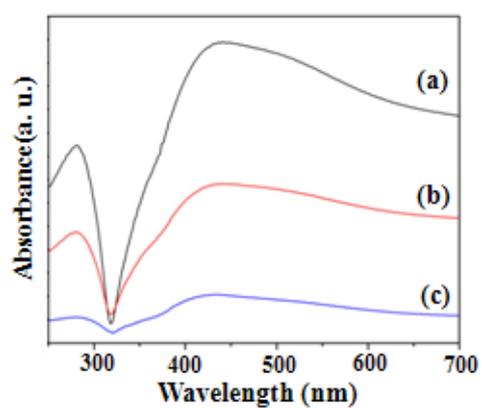


Figure S3. UV-Vis at reaction time of (a) 2 min, (b) 10 min and (c) 30 min of Ag-C-Co sandwich sphere-structures.

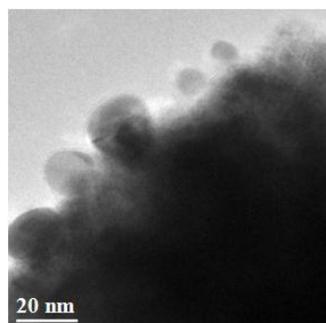


Figure S4. SEM of Co small particles on magnifying surface of Ag-C-Co of 200 nm.

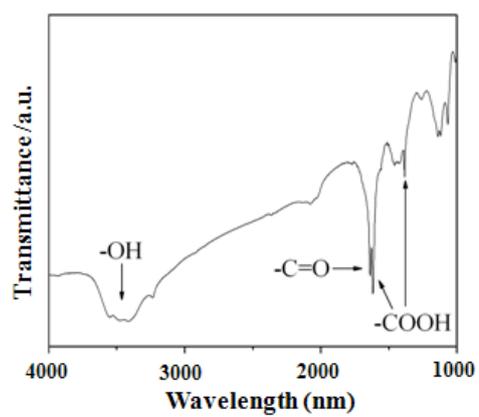


Figure S5. FT-IR spectrum of Ag-C nanoparticles.

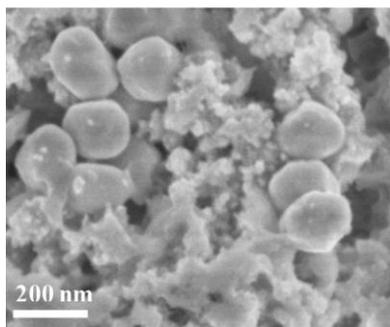


Figure S6. SEM images of Ag-C-Co nanospheres in absence of NaOH.

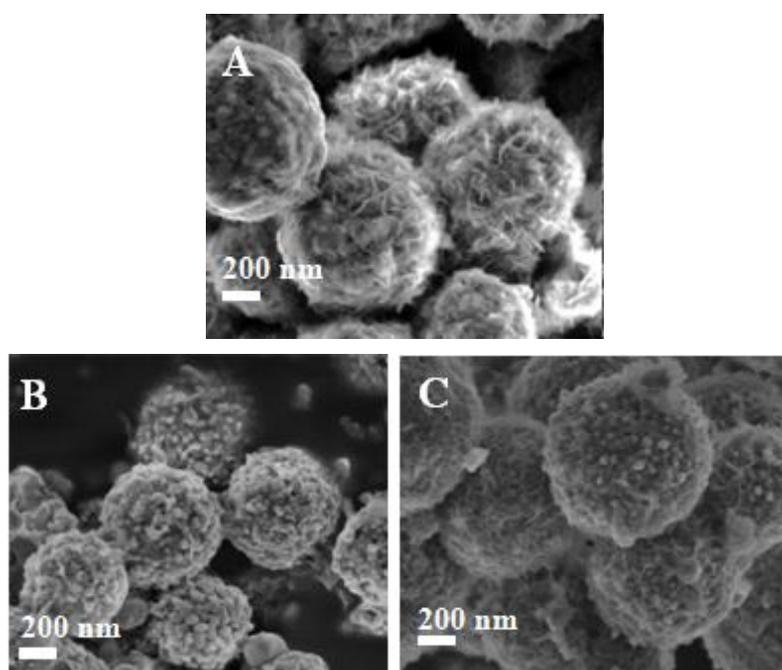


Figure S7. SEM images of Ag-C-Co nanospheres prepared in different molar ratio of PVP: M^{2+} : (A) 9:1; (B) 18:1; (C) 36:1.

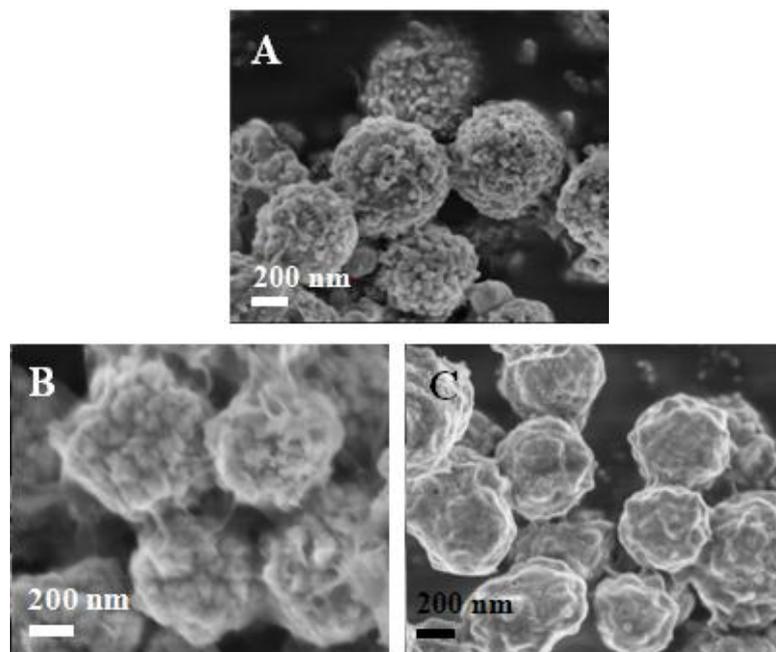


Figure S8. SEM images of Ag-C-Co nanospheres prepared in the different reaction time at 450 K: (A) 30 min; (B) 90 min; (C) 180 min. The surface of the samples became enclose as the reaction time prolonged.

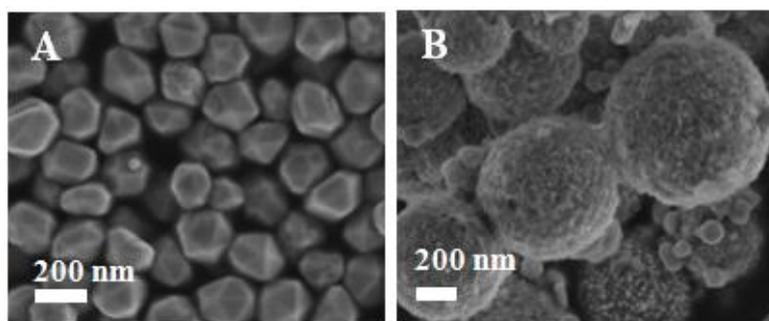


Figure S9. SEM images: (A) Ag nanospheres at ~200 nm; (B) Ag-Co nanospheres at ~200 nm.

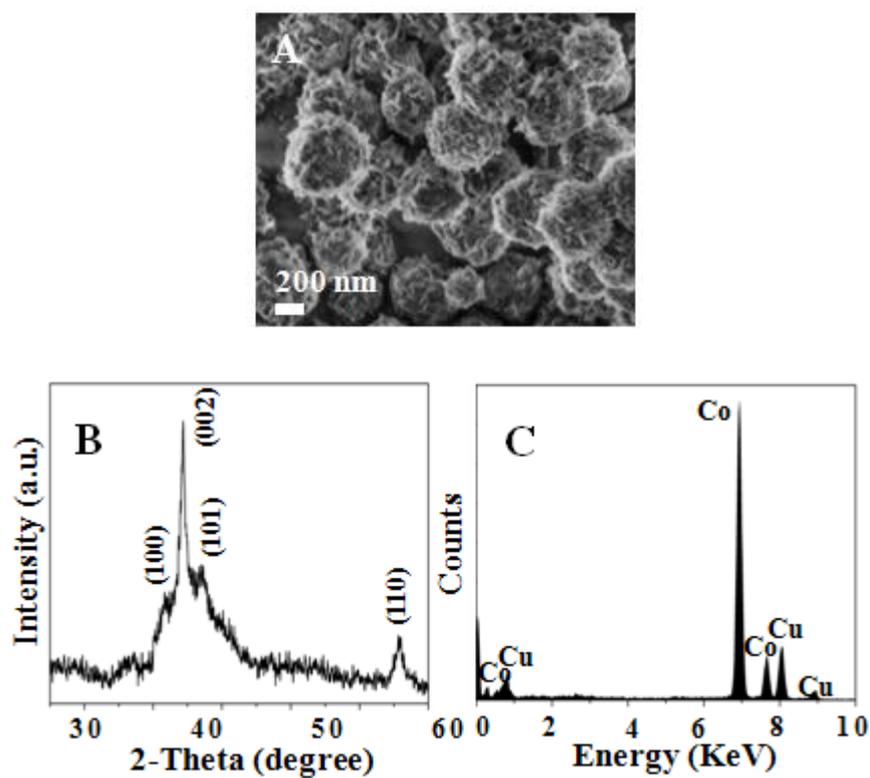


Figure S10. Co nanospheres: (A) SEM images; (B) XRD pattern; (C) EDS analysis (Cu is from the TEM grid).

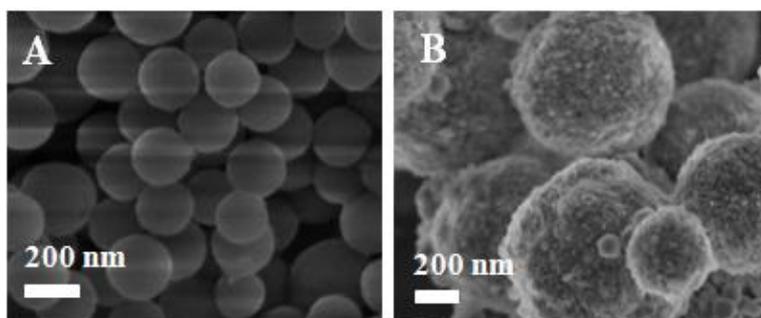


Figure S11. SEM images: (A) C nanospheres; (B) C-Co nanospheres.

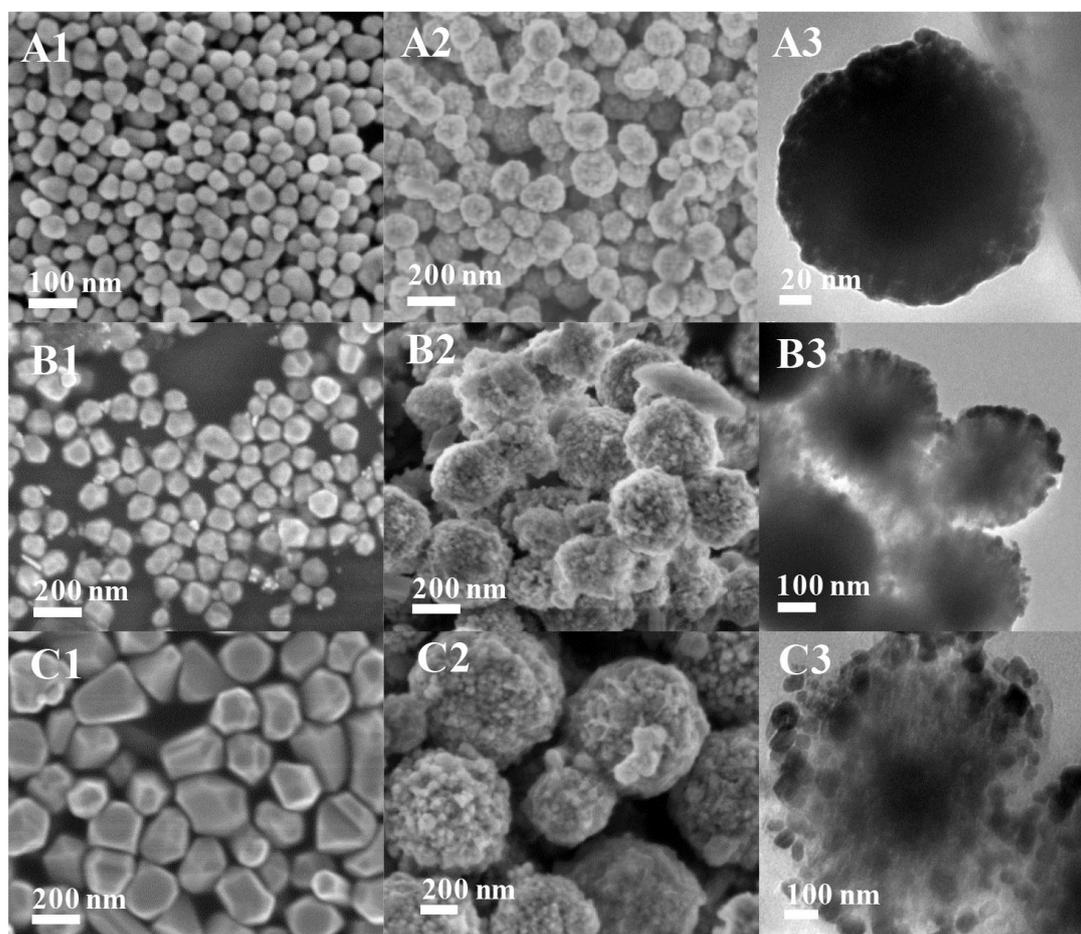


Figure S12. SEM images of Ag-C nanospheres of different size: (A1) 50 nm; (B1) 100 nm; (C1) 250 nm and corresponding Ag-C-Co sandwich sphere-structures of different size: (A2) 170 nm; (B2) 400 nm; (C2) 750 nm. TEM images of Ag-C-Co sandwich sphere-structures of different size: (A3) 170 nm; (B3) 400 nm; (C3) 750 nm.

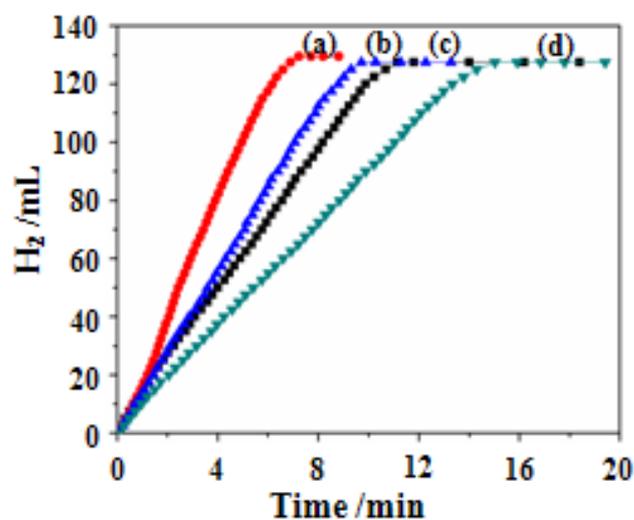


Figure S13. Hydrogen generation from above AB aqueous solution catalyzed by Ag-C-Co sandwich sphere-nanostructures of different size: (a) 170 nm, (b) 400 nm, (c) 600 nm, (d) 750 nm under atmospheric pressure at r.t..

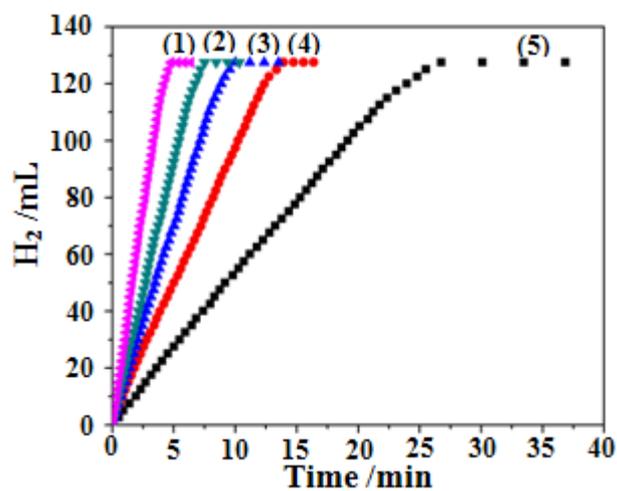


Figure S14. Hydrogen generation from AB aqueous solution (0.13 M, 20 mL) catalyzed by Ag-C-Co sandwich sphere-nanostructures in reaction temperatures at (1) 328 K, (2) 318 K, (3) 308 K, (4) 298 K, (5) 288 K.

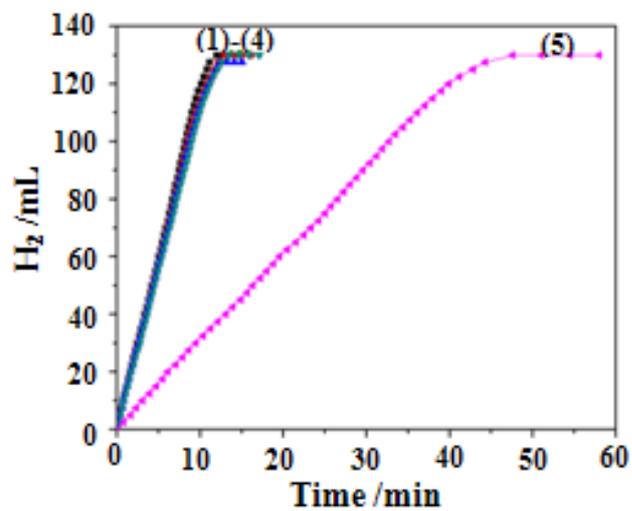


Figure S15. Hydrogen generation from above AB aqueous solution catalyzed by Ag-C-Co sandwich sphere-nanostructures from the 1st to 5th run of the lifetime experiment under atmospheric pressure at r.t..