

Electronic Supplementary Information

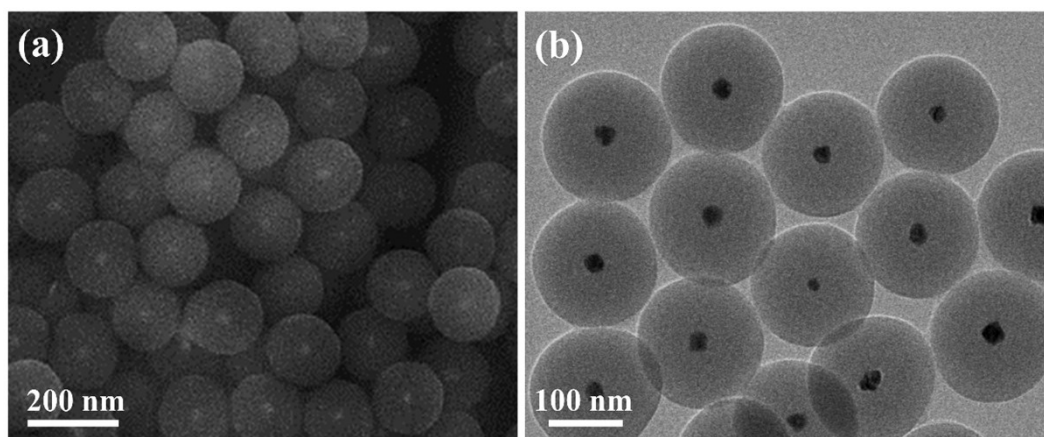


Fig. S1 SEM (a) and TEM (b) images of Pd@SiO₂ nanoparticles.

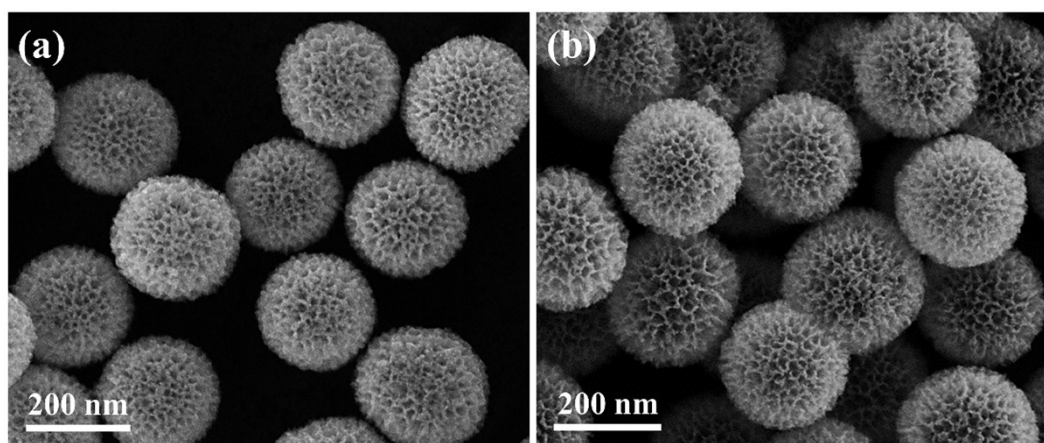


Fig. S2 SEM images of Pd@SiO₂@PtPd nanoparticles before etching (a) and Pd@PtPd DYSNs after etching (b).

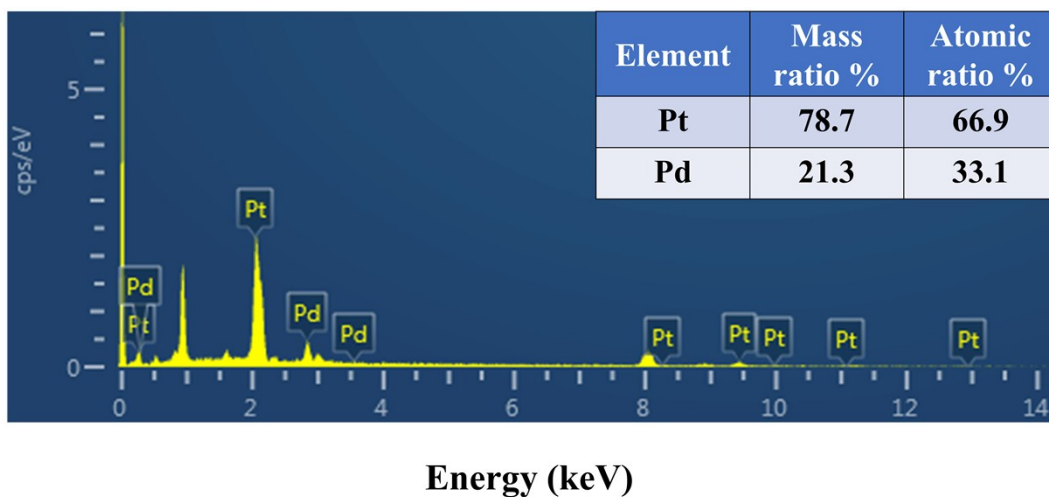


Fig. S3 EDX spectrum of the Pd@PtPd DYSNs.

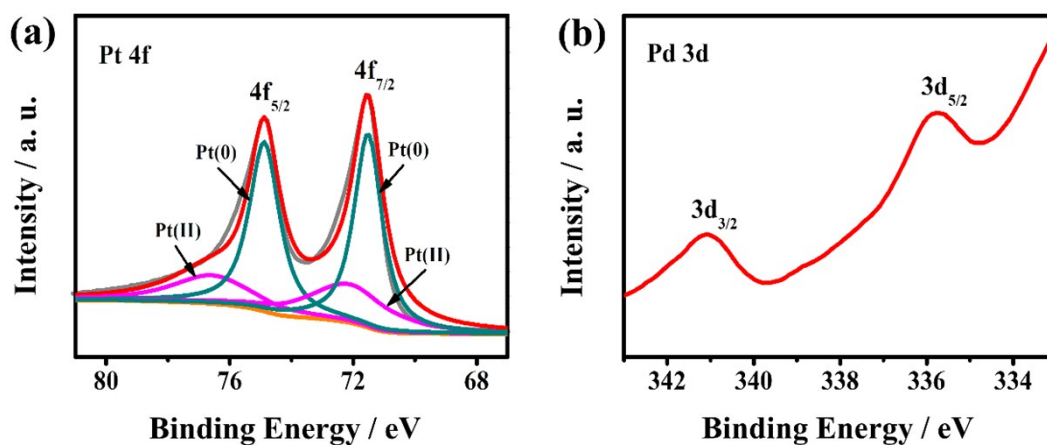


Fig. S4 XPS spectra of Pt 4f (a) and Pd 3d (b) regions for the Pd@PtPd DYSNs.

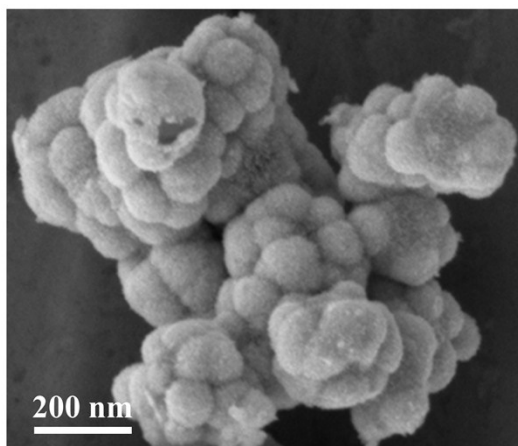


Fig. S5 SEM image of the sample prepared in the typical condition without F127.

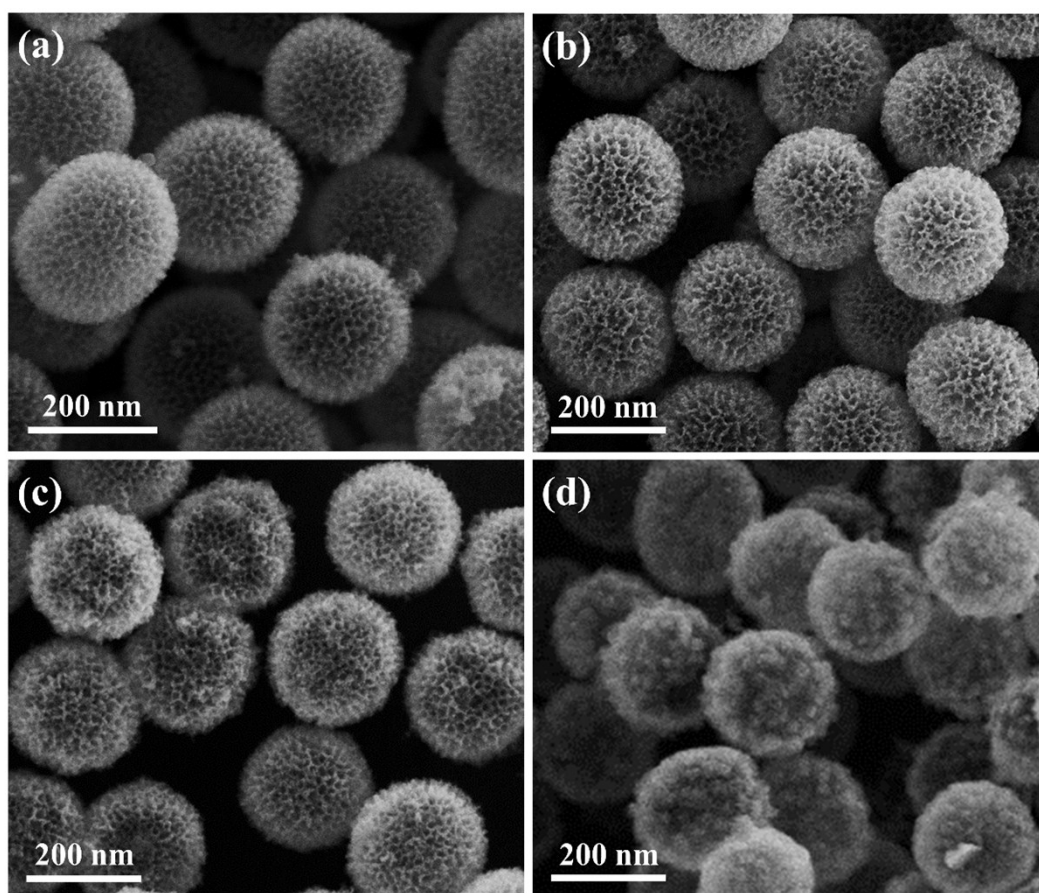


Fig. S6 SEM images of the samples with different ratio of Pt and Pd precursors: (a) Pd@Pt, only K_2PtCl_4 was added. (b) Pd@PtPd DYSNs, $\text{K}_2\text{PtCl}_4/\text{Na}_2\text{PdCl}_4 = 3/1$. (c) Pd@Pt₂Pd₂, $\text{K}_2\text{PtCl}_4/\text{Na}_2\text{PdCl}_4 = 2/2$. (d) Pd@Pt₁Pd₃, $\text{K}_2\text{PtCl}_4/\text{Na}_2\text{PdCl}_4 = 1/3$.

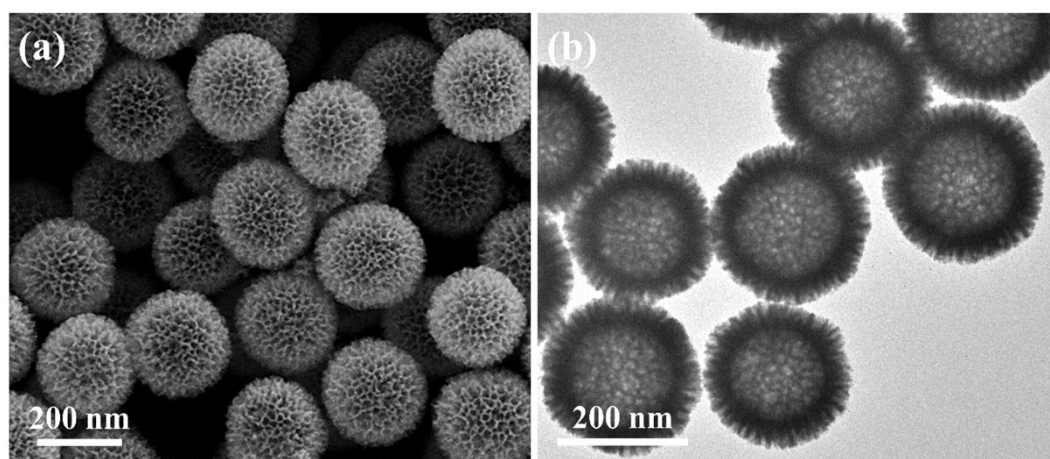


Fig. S7 SEM (a) and TEM (b) images of the PtPd DHNs.

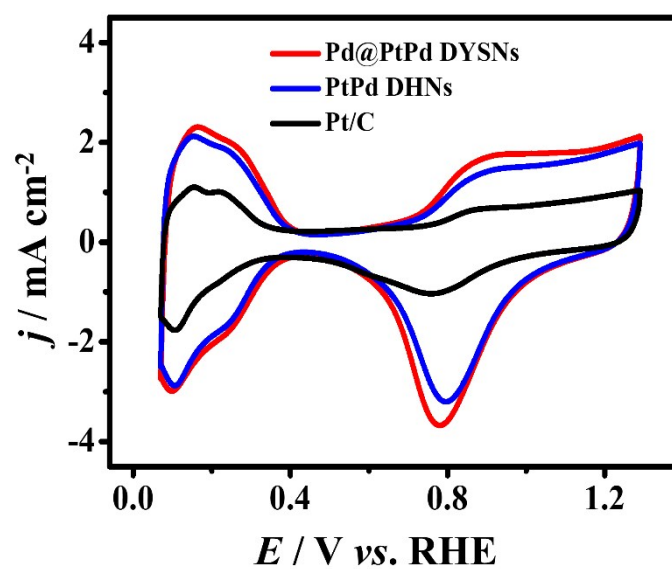


Fig. S8 Cyclic voltammetry curves of Pd@PtPd DYSNs, PtPd DHNs and Pt/C in N_2 -saturated 0.1 M HClO_4 solution at room temperature.