

Supporting Information

Palladium/Tin Bimetallic Single-Crystalline Hollow Nanospheres

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Experimental Details

Synthesis of Pd/Sn hollow nanospheres:

0.25mmol SnCl₂•2H₂O, 0.05mmol Pd(acac)₂ and 0.75mmol Didodecyldimethyl-ammonium bromide(DDAB) were dissolved together in 4ml Oleylamine(OAm) to get a light yellow transparent solution, 4ml Octadecene(ODE) and 1ml OAm solution were heated up to 300 °C. Then the as-prepared light yellow transparent solution was injected into the hot solution. The hot solution turned black as soon as the yellow solution was added. After 15 minutes, the reaction ceased and cooled down at room temperature, the as-prepared black solution was washed with EtOH for 3 times and then dissolved in cyclohexane.

Characterization:

X-ray diffraction patterns were recorded with a Rigaku D/max 2500Pc X-ray powder diffractometer with monochromatized Cu K α radiation (λ = 1.5406 Å). The size and the morphology of as-synthesized samples were determined by using Hitachi model H-800 transmission electron microscope and JEOL-2010F high-resolution transmission electron microscope. The energy dispersive spectroscopy was recorded to determine the composition of the products. High-resolution transmission electron microscopy observations were performed by using a FEI Titan 80–300 transmission electron microscope equipped with a spherical aberration (Cs) corrector for the objective lens. The UV-vis adsorption spectra were obtained via a Hitachi U-3010 UV–vis spectrometer.

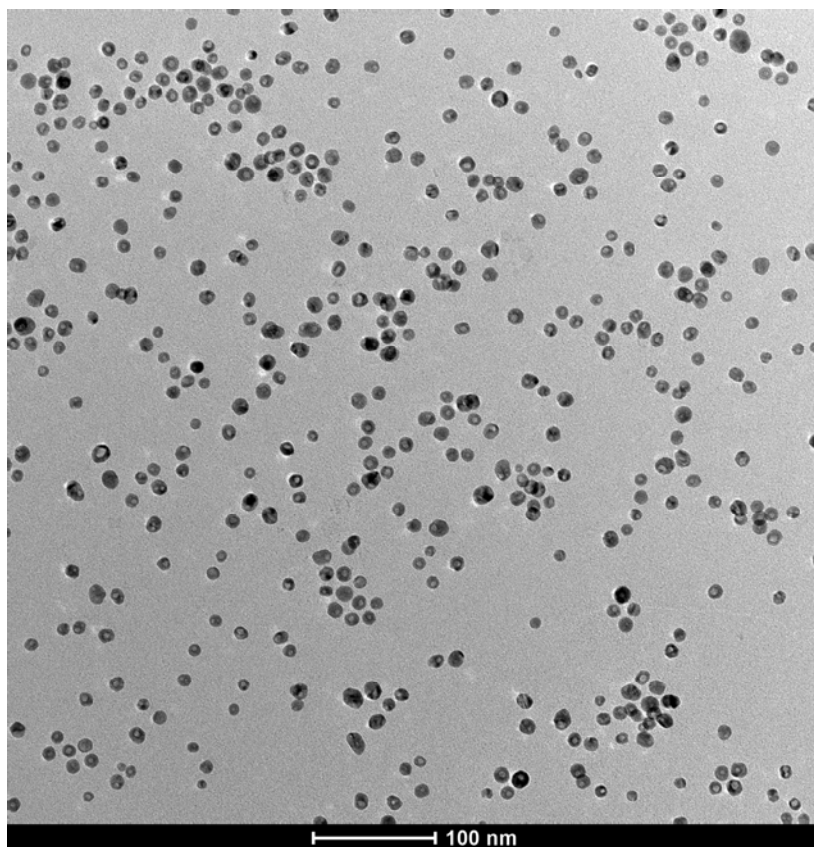


Figure S1. HRTEM images of as-obtained Pd/Sn bimetallic hollow nanospheres at 300°C for 15 minutes.

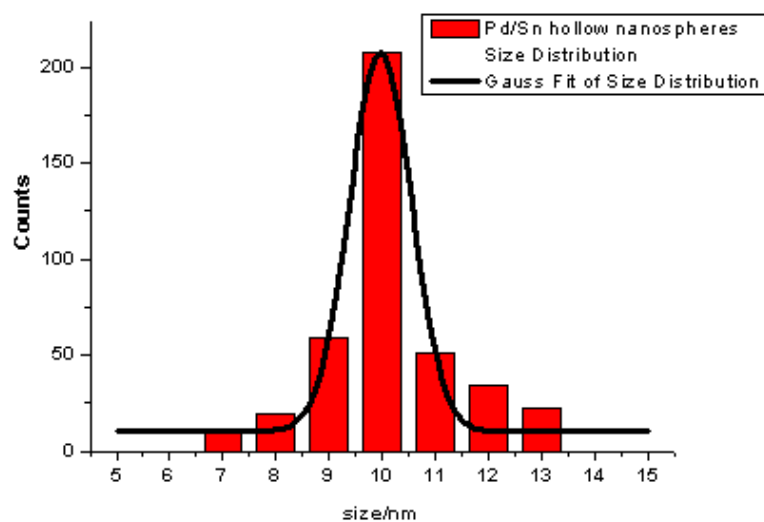


Figure S2. Size Distribution profile of hollow Pd/Sn bimetallic hollow nanospheres.

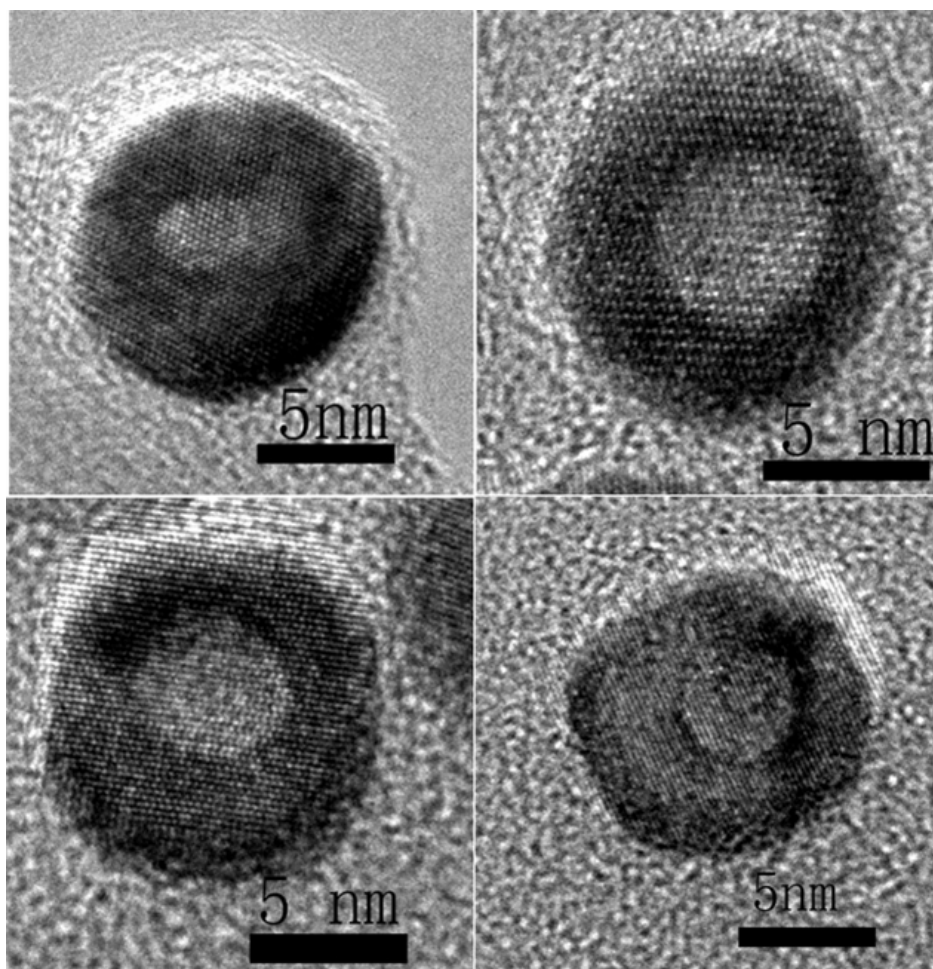


Figure S3. HRTEM images of as-obtained Pd/Sn bimetallic hollow nanospheres.

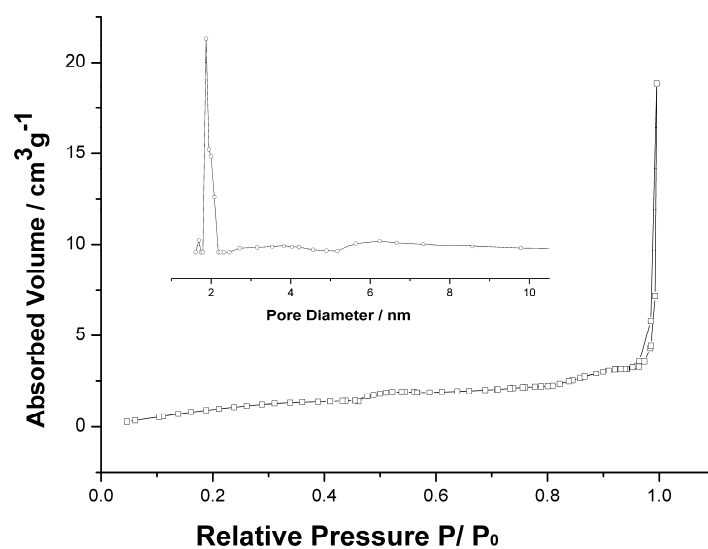


Figure S4. N₂ adsorption-desorption isotherms, pore size distribution curves for Pd/Sn hollow nanospheres.

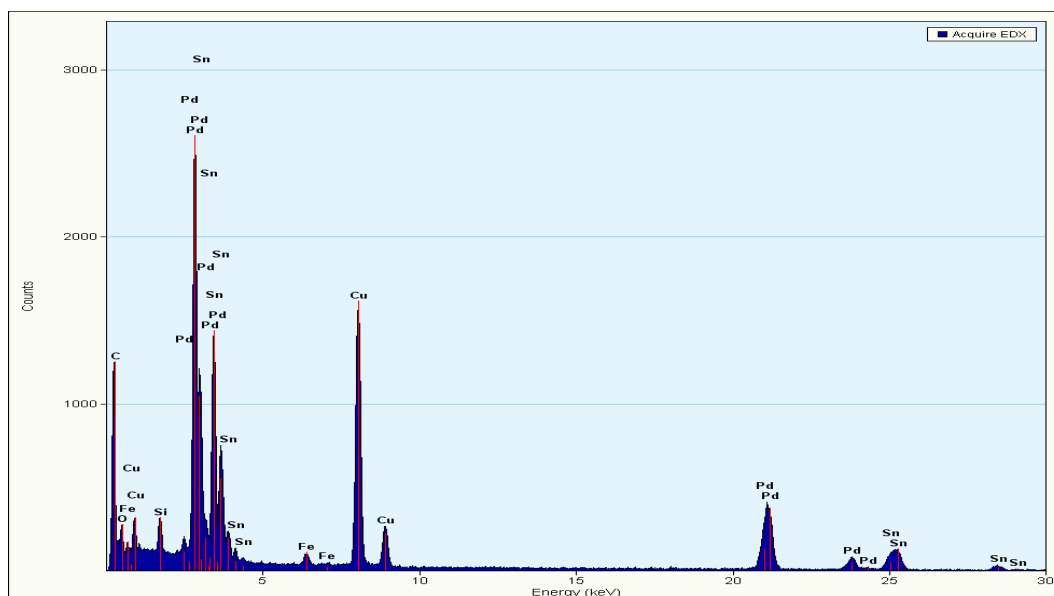


Figure S5. EDS analysis of Pd/Sn bimetallic hollow nanospheres samples.

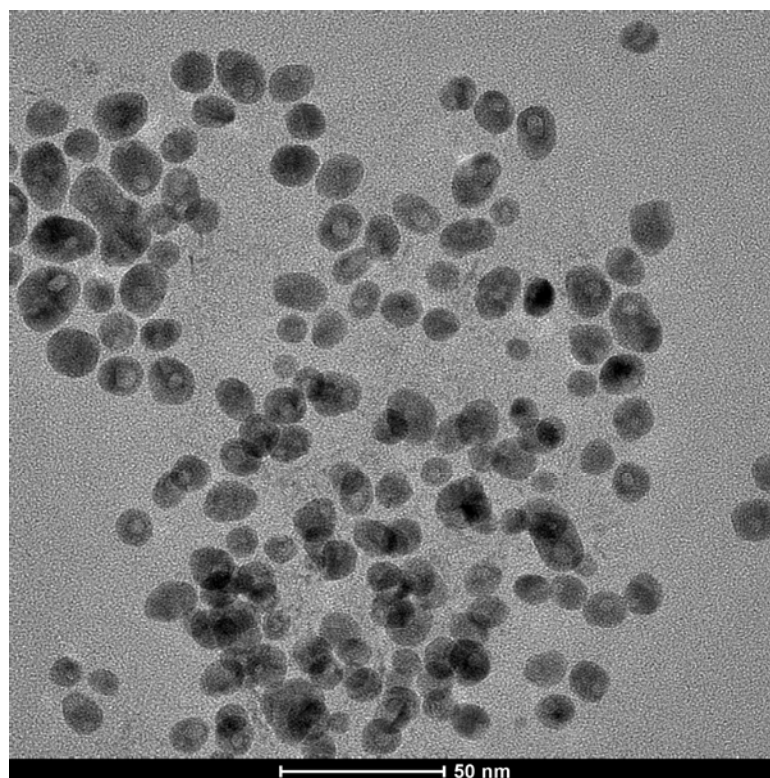


Figure S6. HRTEM images of Pd/Sn bimetallic hollow nanospheres. The samples were collected after 1 minute at 300°C, which showed that formation of hollow nanostructure was very fast.

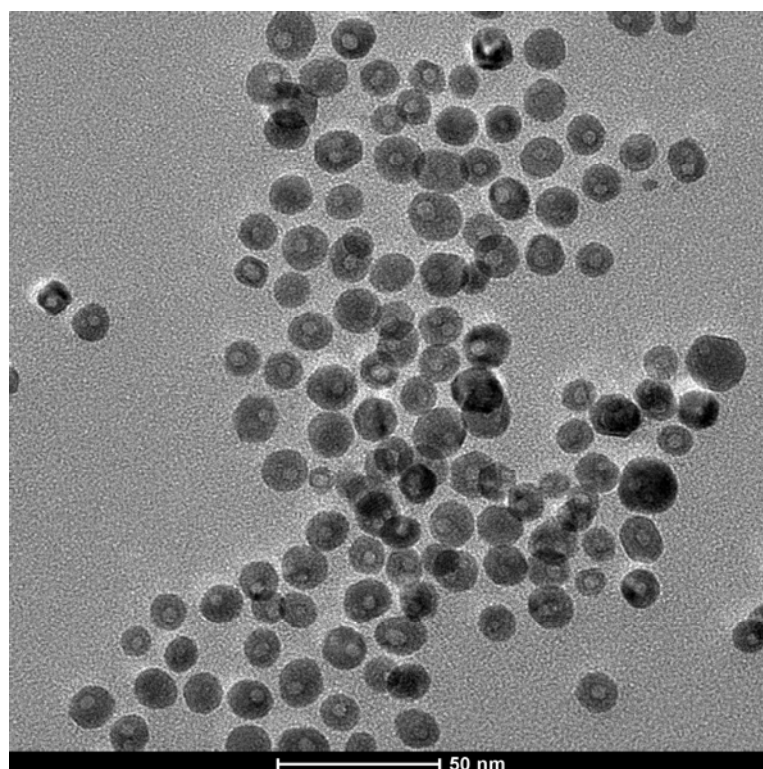


Figure S7. HRTEM images of Pd/Sn bimetallic hollow nanospheres, the samples were collected after 120minutes at 300°C, which showed that the as-obtained Pd/Sn bimetallic hollow nanospheres were stable.

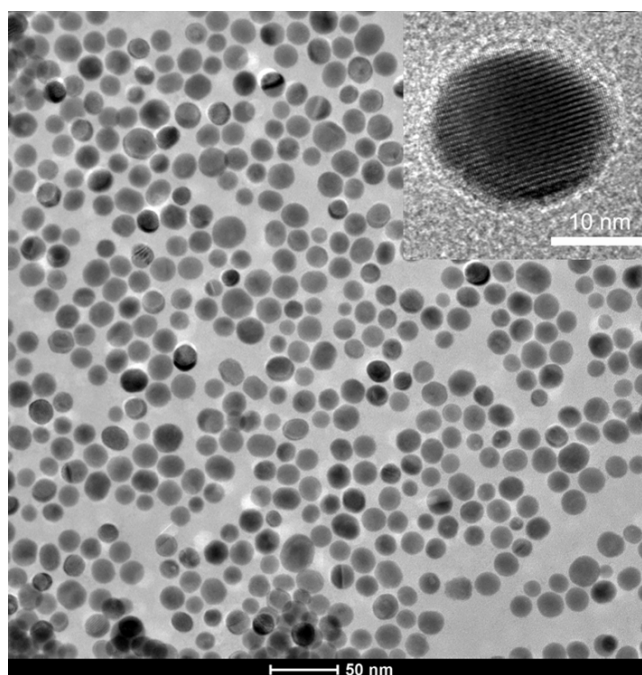


Figure S8. TEM image of Pd/Sn bimetallic samples without adding DDAB.

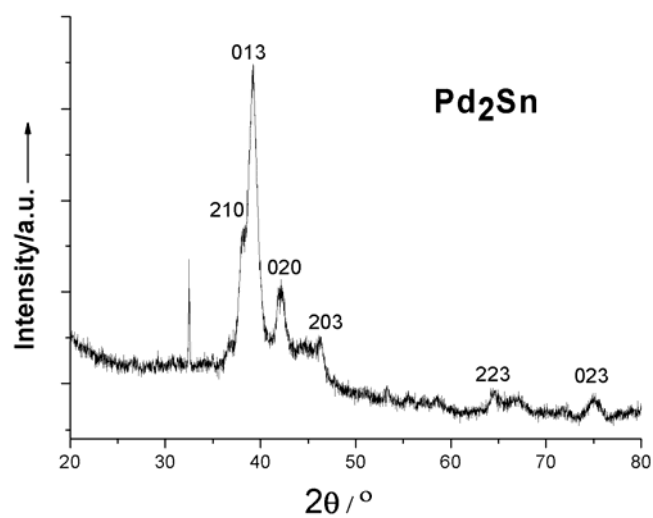


Figure S9. XRD pattern of as-obtained Pd/Sn bimetallic nanospheres without DDAB.

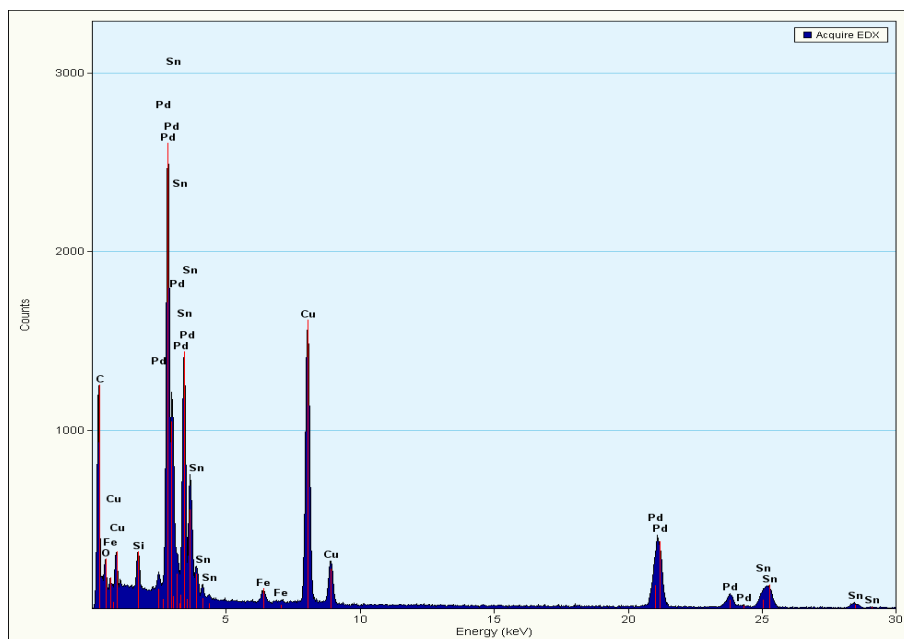


Figure S10. EDS analysis of as-obtained Pd/Sn bimetallic hollow nanospheres without DDAB.

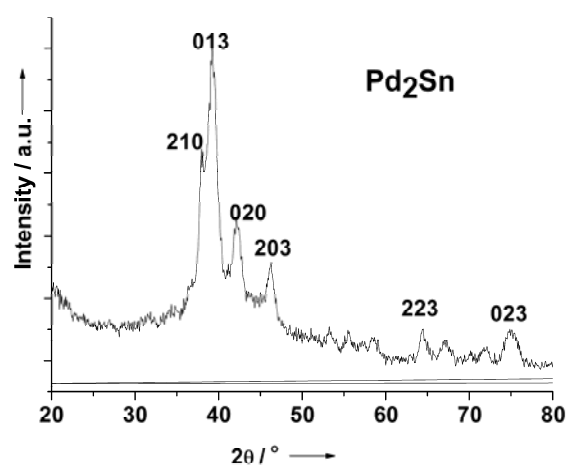


Figure S11. XRD pattern of as-obtained Pd/Sn bimetallic nanospheres added TOAB instead of DDAB.

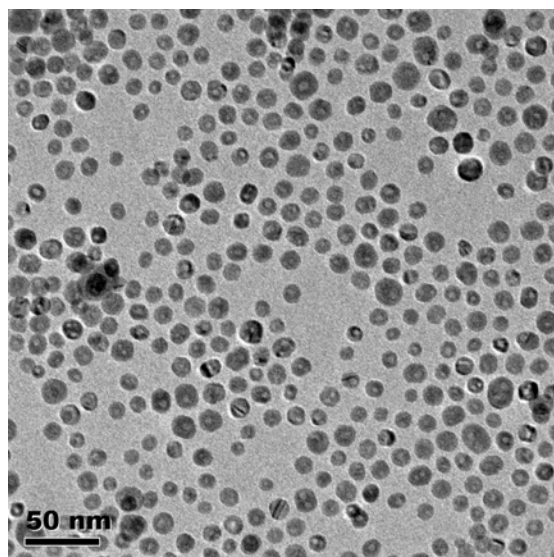


Figure S12. TEM images of as-obtained Pd/Sn bimetallic hollow nanospheres using TOAB instead of DDAB.

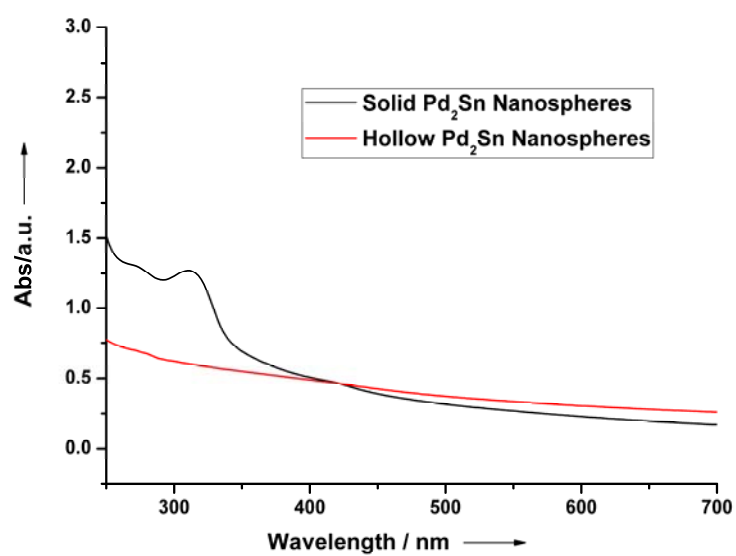


Figure S13. UV-vis absorption spectra of Solid and Hollow Pd_2Sn nanospheres