Mechanistic Study on the Bis(*p*-sulfonatophenyl)phenylphosphine Synthesis of Monometallic Pt Hollow Nanoboxes Using Ag*-Pt Core-Shell Nanocubes as Sacrificial Templates

Yen-Nee Tan, [b] Jun Yang, [a] Jim Yang Lee,* [a,b] and Daniel I.C. Wang [b,c]

[a] Department of Chemical and Biomolecular Engineering, National University of Singapore. 10 Kent Ridge Crescent, Singapore 119260. Fax: 65 6779 1936; Tel: 65 6516 2899; E-mail: cheleejy@nus.edu.sg

[b] Singapore-MIT Alliance, 4 Engineering Drive 3, National University of Singapore, Singapore 117576

[c] Department of Chemical Engineering, Massachusetts Institute of Technology Room 16-429, 77 Massachusetts Ave, Cambridge MA 02139 USA

Supporting Information

S1: BSPP Assisted Dissolution of AgCl Nanoparticles

Samples were drawn from AgCl nanoparticles recovered by centrifugation from the reaction mixture before chemical reduction, which were washed copiously with deionised water to remove the unbound ions. Evidence for the dissolution of AgCl nanoparticles was provided by changes in the color of the solution and the disappearance of the nanoparticles in TEM images after the BSPP or saturated NaCl treatment.

(a) (b) (c)

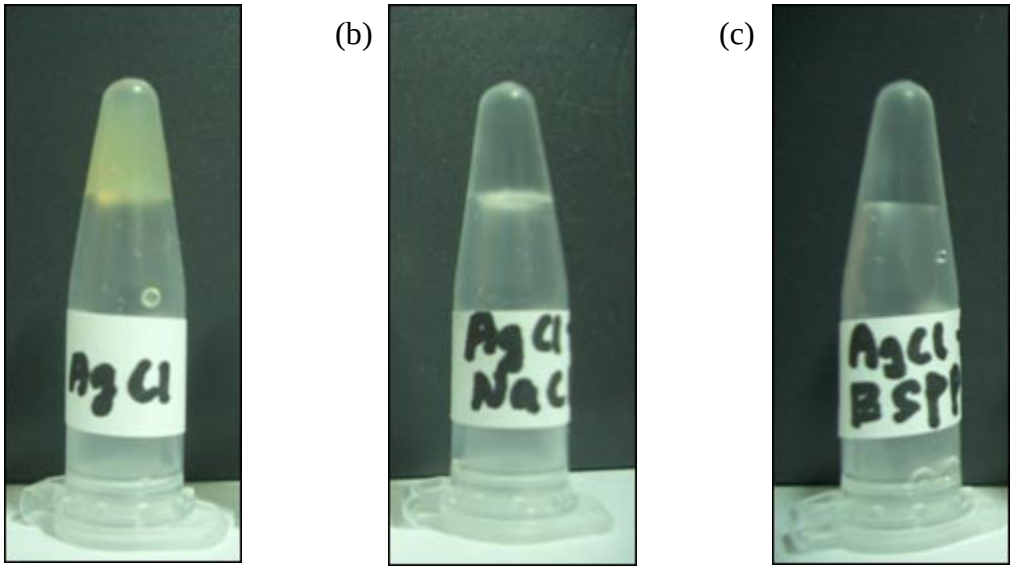

Figure S1. Digital photos of (a) AgCl nanoparticle solution; and the solubilzation of AgCl nanoparticles upon addition of (b) saturated NaCl and (c) BSPP to the AgCl solution in (a).

S2: Confirmation of BSPP-Ag Complex formation

Two samples were prepared by mixing a $AgNO_3$ solution with a NaCl solution. Solution (a) contained only the mixture of $AgNO_3$ and NaCl, while solution (b) contained dissolved BSPP, $AgNO_3$ and NaCl. AgCl nanoparticles were readily precipitated in solution (a) while no precipitation occurred in solution (b). This shows that complexation of BSPP with Ag^+ had effectively shifted the AgCl equilibrium towards dissolution.

(a) 

(b) 

Figure S2. Digital photos of mixtures containing (a) $AgNO_3$ and NaCl and (b) $AgNO_3$, NaCl and dissolved BSPP.