

Supporting Information

Characterization of Colloidal Platinum Nanoparticles by MALDI-TOF Mass Spectrometry

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Abstract

Contained herein are TEM images and histograms (Figures S-1 to S-4), XRD patterns (Figure S5) and MALDI-TOF mass spectra with corresponding Gaussian curve fits (Figures S-6 to S-10) for the as-synthesized colloidal Pt nanoparticles.

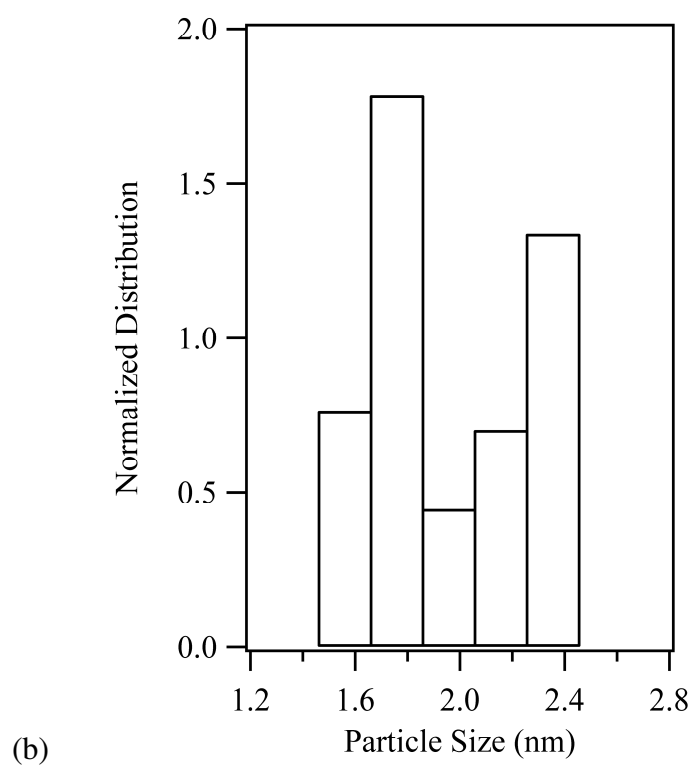
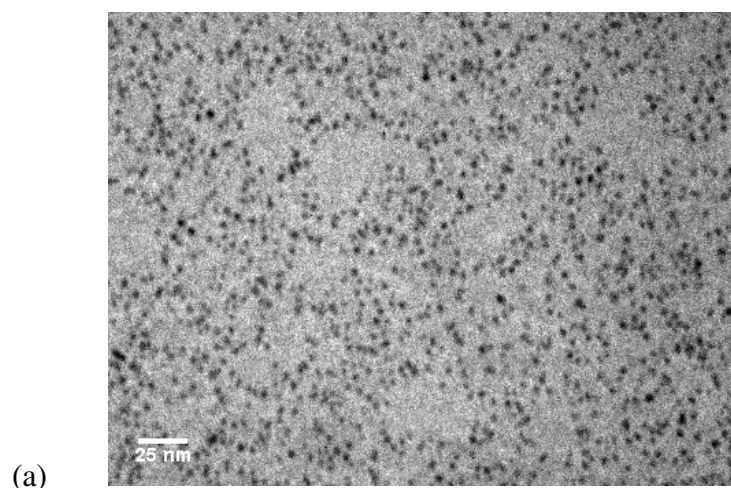


Figure S-1. (a) TEM image of PVP-capped platinum nanoparticles synthesized by reduction in the presence of ethylene glycol and (b) histogram of the particle size distribution.

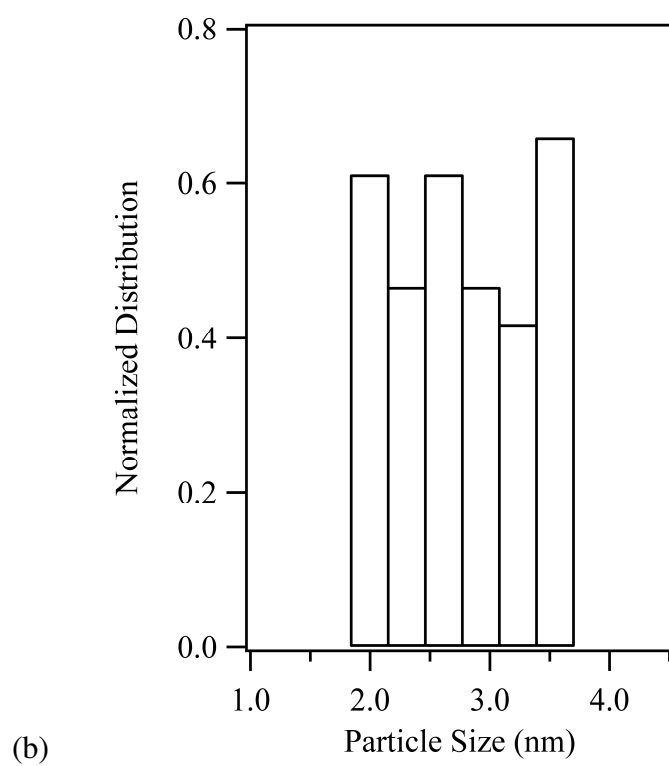
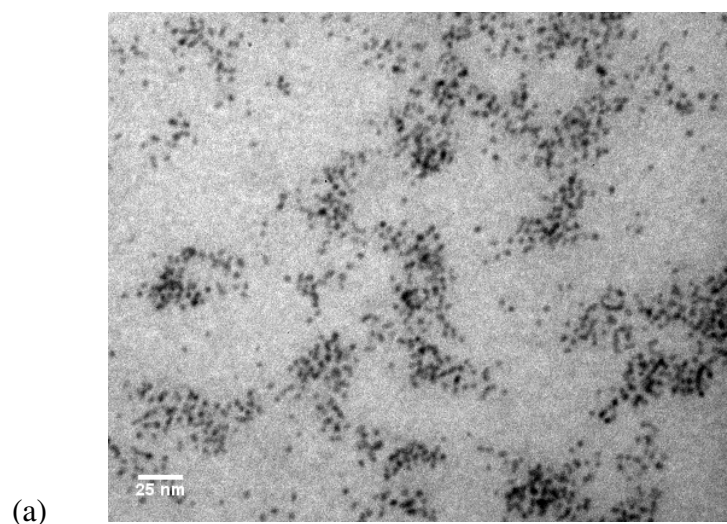


Figure S-2. (a) TEM image of PVP-capped platinum nanoparticles synthesized by reduction in the presence of ethanol and (b) histogram of the particle size distribution.

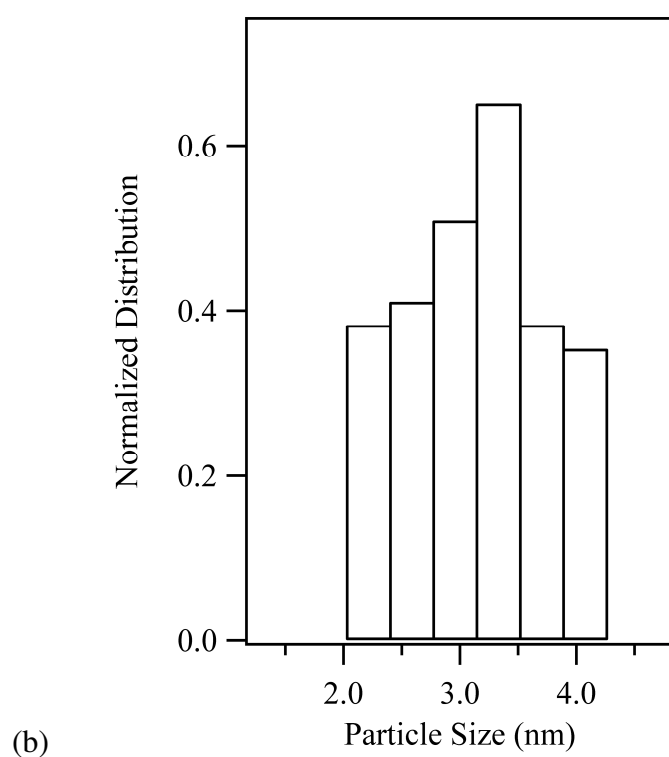
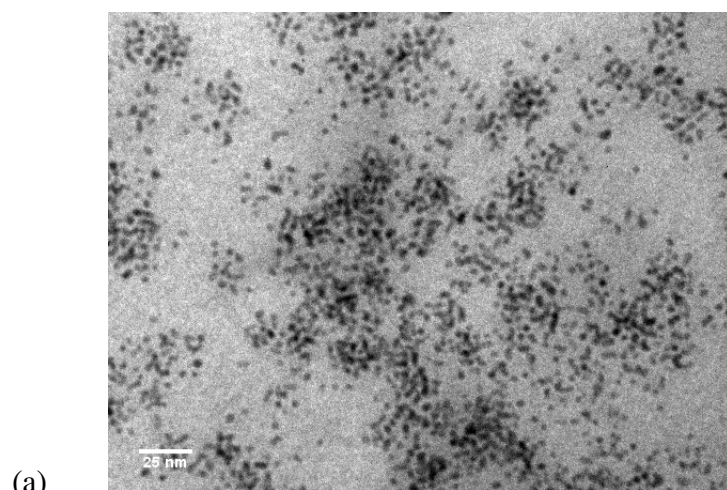


Figure S-3. (a) TEM image of PVP-capped platinum nanoparticles synthesized by reduction in the presence of methanol and (b) histogram of the particle size distribution.

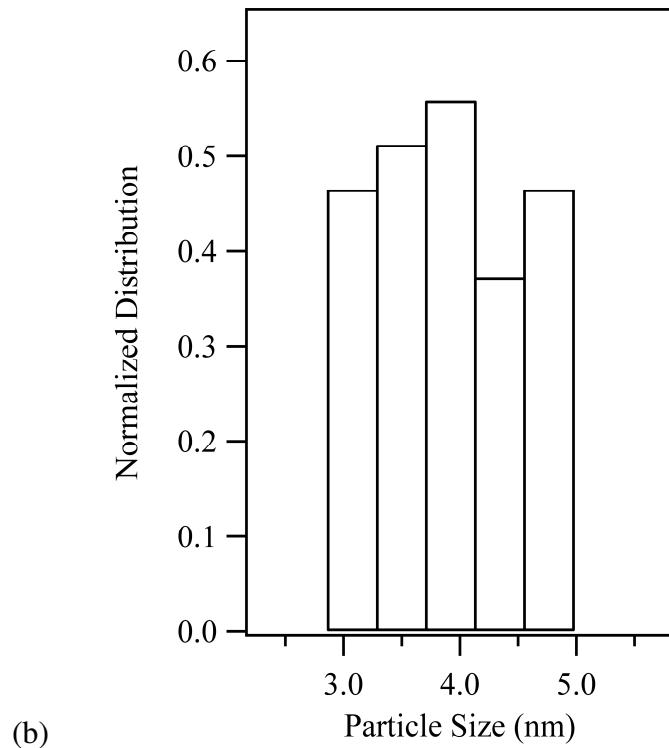
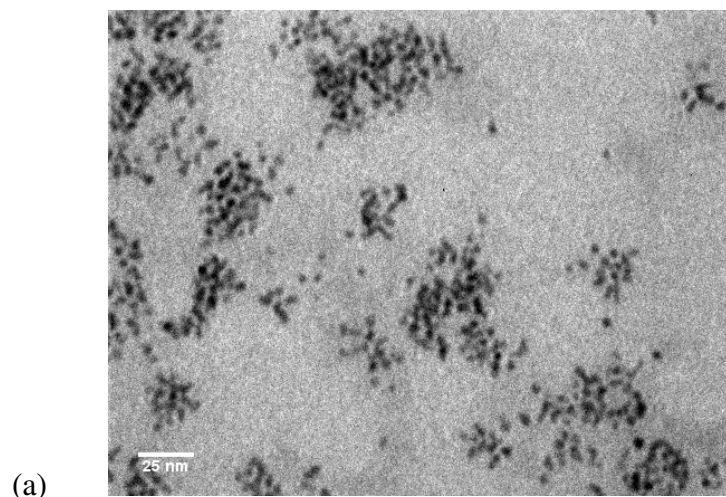


Figure S-4. (a) TEM image of PVP-capped platinum nanoparticles synthesized by further reduction in the presence of methanol and 2.94-nm PVP-capped platinum nanoparticles and (b) histogram of the particle size distribution.

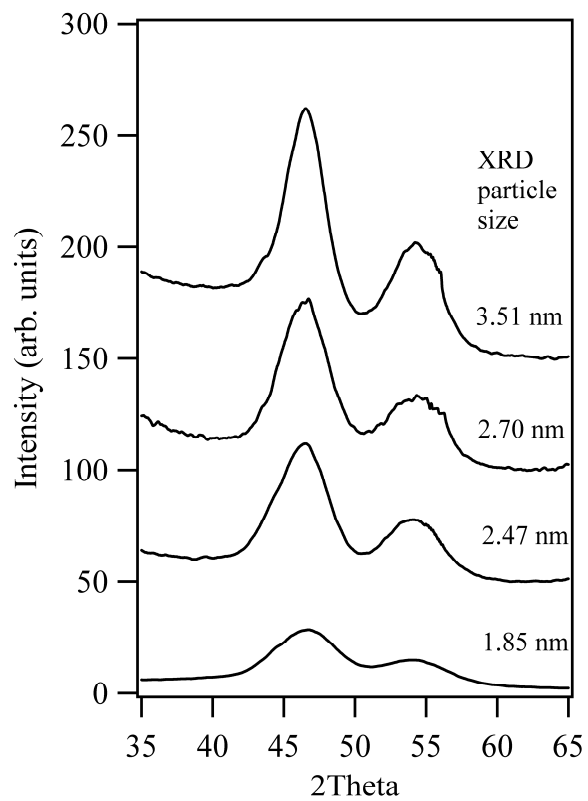


Figure S-5. XRD patterns obtained for PVP-capped platinum nanoparticles. Patterns are vertically offset for clarity.

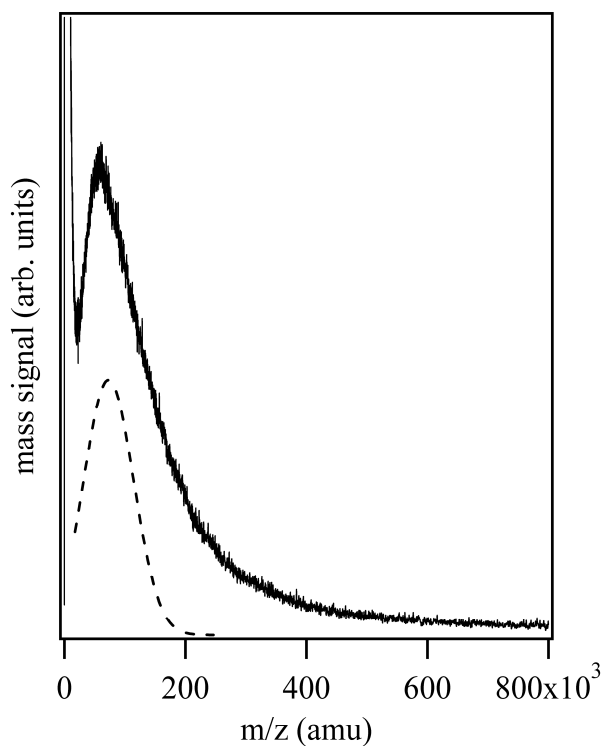


Figure S-6. MALDI-TOF mass spectrum of 1.85-nm PVP-capped platinum nanoparticles obtained after 200 shots from a 337-nm N₂ laser on sample spots from a solution of 1:10 v/v platinum nanoparticle colloid to CHCA matrix solution. The dashed line corresponds to the Gaussian curve fit for singly-charged ($m/z = 73,000$ amu) particles.

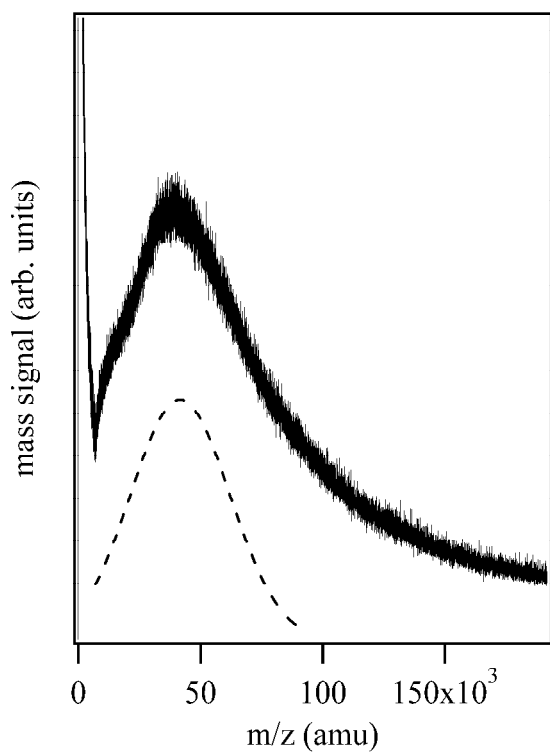


Figure S-7. MALDI-TOF mass spectrum of 1.85 nm uncapped platinum nanoparticles obtained after 200 shots from a 337-nm N_2 laser on sample spots from a solution of 1:10 v/v platinum nanoparticle colloid to CHCA matrix solution. The dashed line corresponds to the Gaussian curve fit for singly-charged ($m/z = 42,000$ amu) particles.

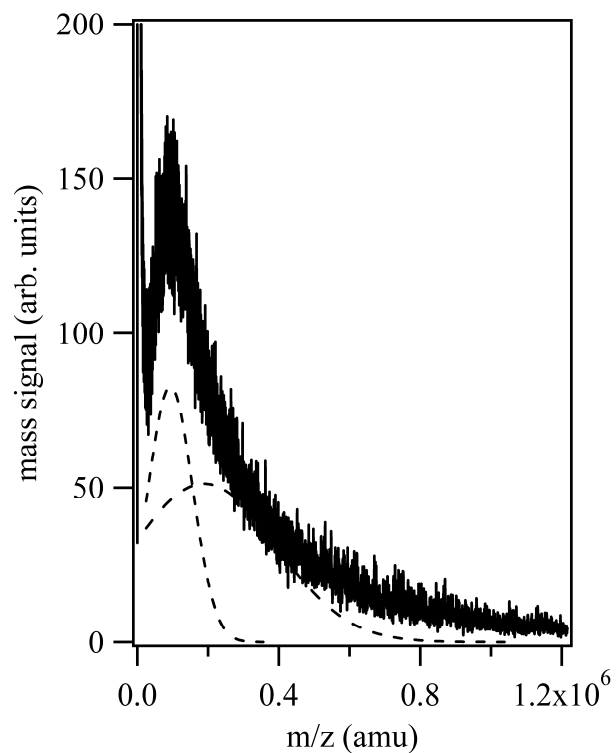


Figure S-8. MALDI-TOF mass spectrum of 2.60-nm PVP-capped platinum nanoparticles obtained after 200 shots from a 337-nm N₂ laser on sample spots from a solution of 1:10 v/v platinum nanoparticle colloid to CHCA matrix solution. The dashed lines correspond to Gaussian curve fits for doubly-charged ($m/z = 93,600$ amu) and singly-charged ($m/z = 189,000$ amu) particles.

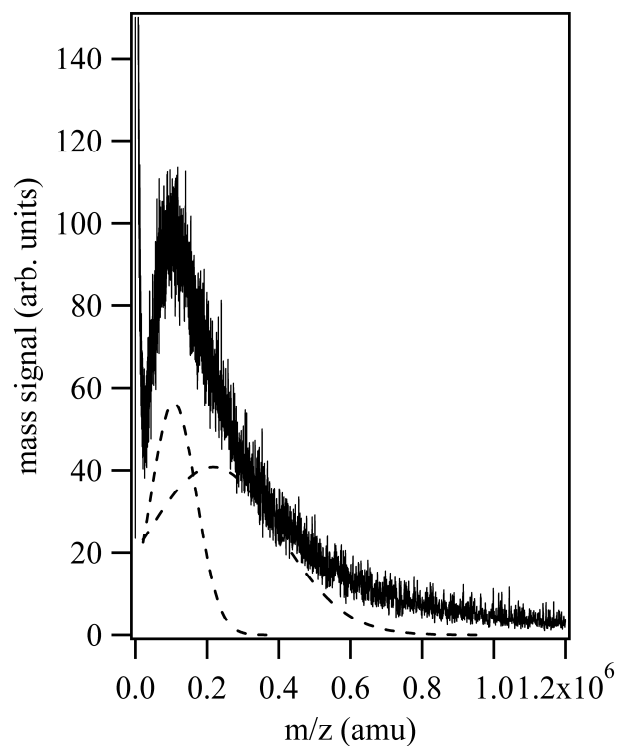


Figure S-9. MALDI-TOF mass spectrum of 2.94-nm PVP-capped platinum nanoparticles obtained after 200 shots from a 337-nm N₂ laser on sample spots from a solution of 1:10 v/v platinum nanoparticle colloid to CHCA matrix solution. The dashed lines correspond to Gaussian curve fits for doubly-charged ($m/z = 107,000$ amu) and singly-charged ($m/z = 216,000$ amu) particles.

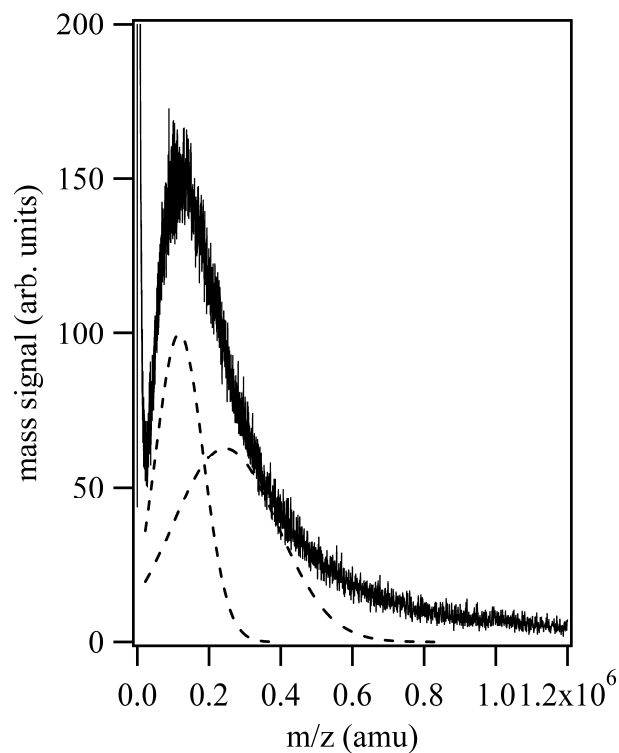


Figure S-10. MALDI-TOF mass spectrum of 3.69-nm PVP-capped platinum nanoparticles obtained after 200 shots from a 337-nm N₂ laser on sample spots from a solution of 1:10 v/v platinum nanoparticle colloid to CHCA matrix solution. The dashed lines correspond to Gaussian curve fits for triply-charged ($m/z = 117,000$ amu) and doubly-charged ($m/z = 245,000$ amu) particles.