

Supporting Information

Large-Scale Synthesis of Shape-Controlled Metal Nanocrystals in Aqueous Suspensions

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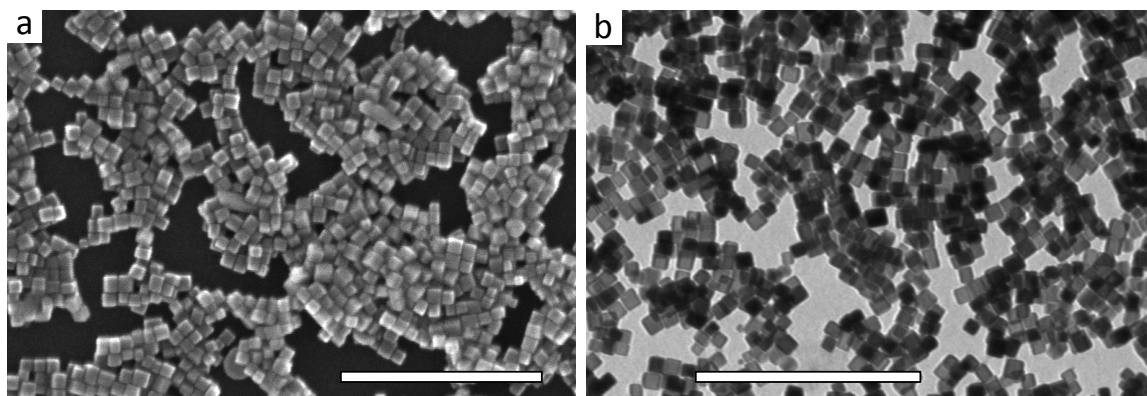


Figure S1. SEM (a) and TEM (b) images of 11.1 ± 1.2 nm Pd cubic seeds used for seed-mediated growth.

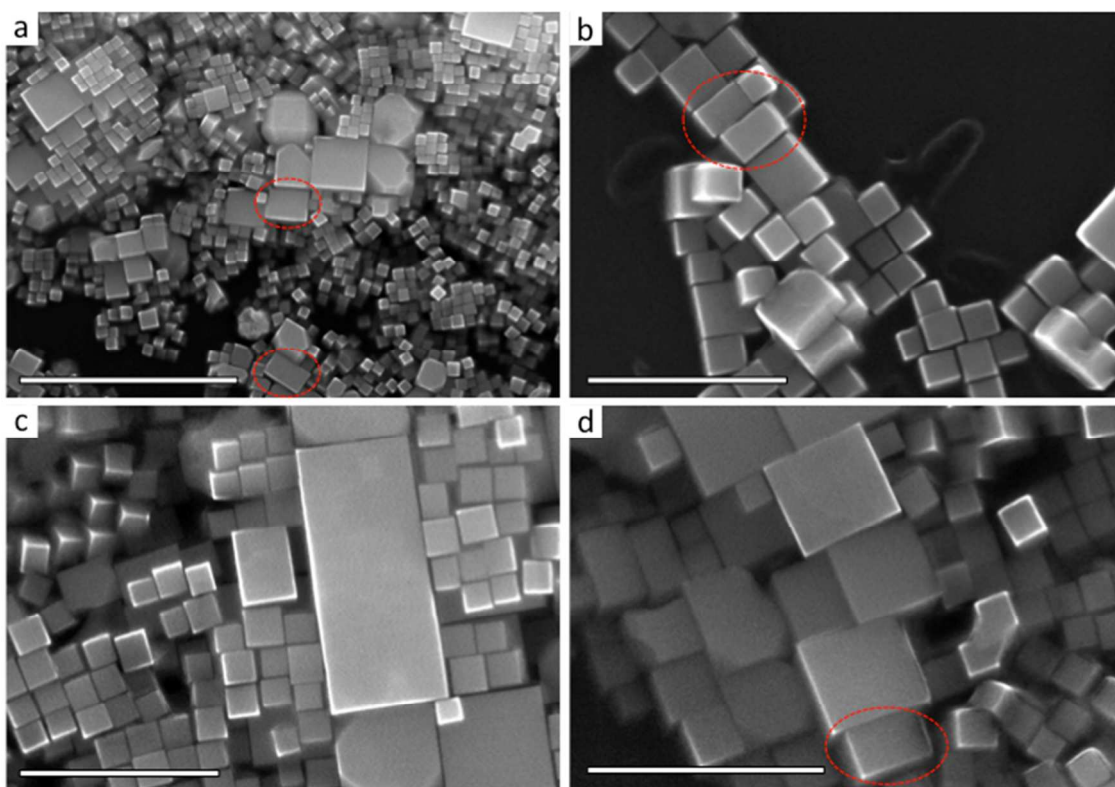


Figure S2. SEM images of Pd NCs prepared at 0.026 M Pd^{2+} and 0.1 M CTAB concentration with no stirring of the reaction mixture. Red outlines highlight some Pd nanocrystals shaped as rectangular prisms. Scale bars are 1 μm (a) and 300 nm (b-d).

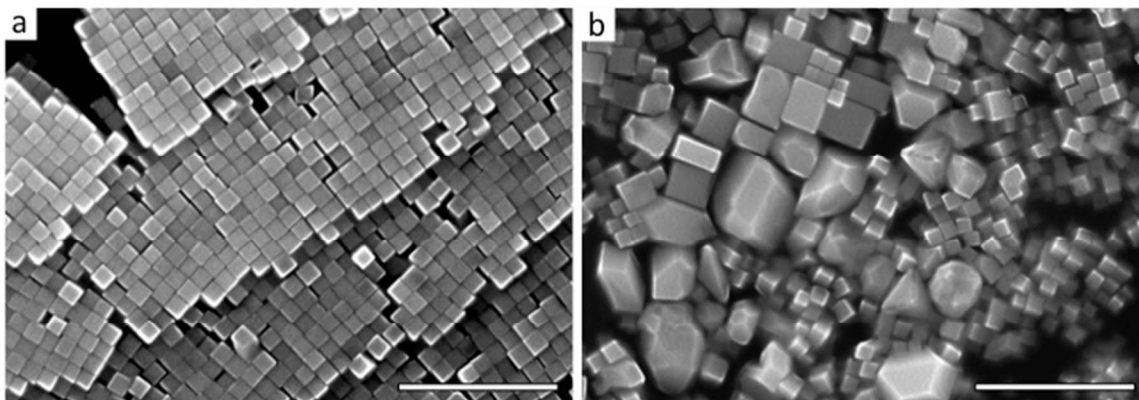


Figure S3. SEM images of Pd NCs prepared at 0.026 M Pd²⁺ and different concentrations of CTAB: (a) 0.1 M, (b) 0.05 M. Scale bars are 500 nm.

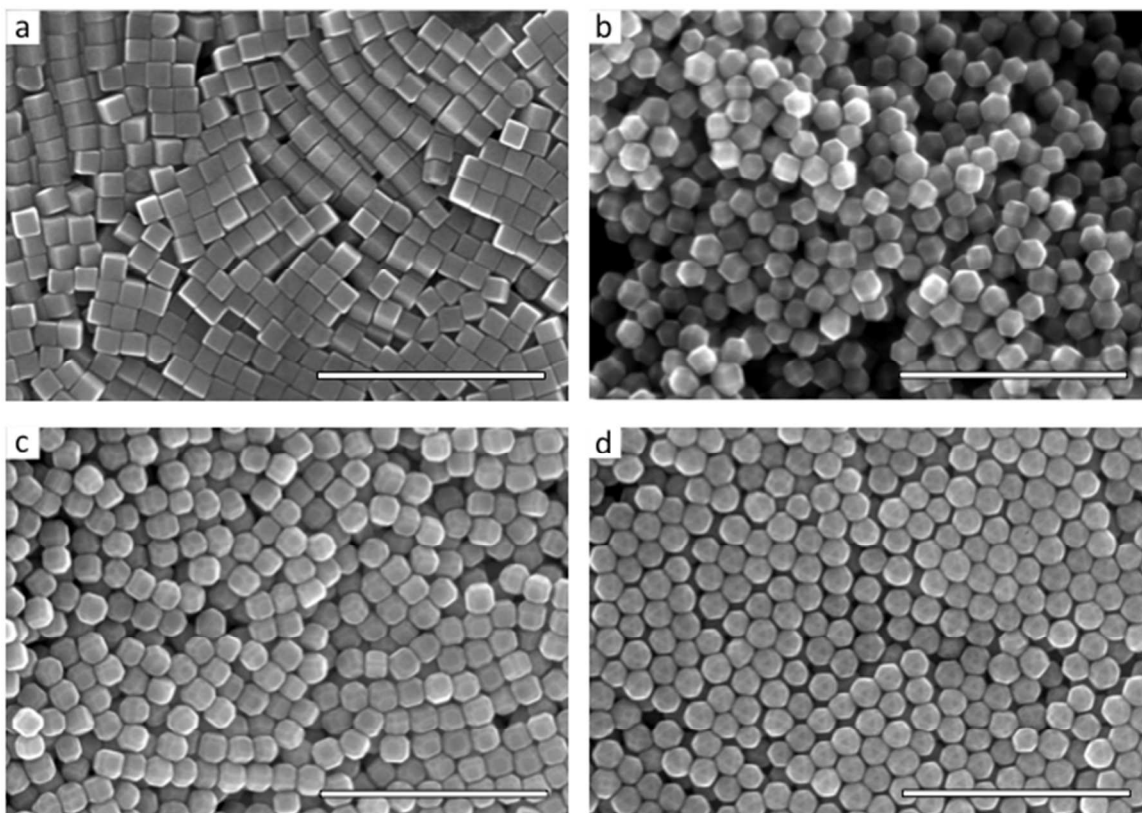


Figure S4. Low magnification SEM images of Pd NPs shown in Figure 2, prepared with no inorganic ion additives (a) and in the presence of I⁻ ions: [I⁻] = 0.1 mM at 30°C (b), [I⁻] = 0.05 mM at 30°C (c), and [I⁻] = 0.1 mM at 45°C. Scale bars are 500 nm.

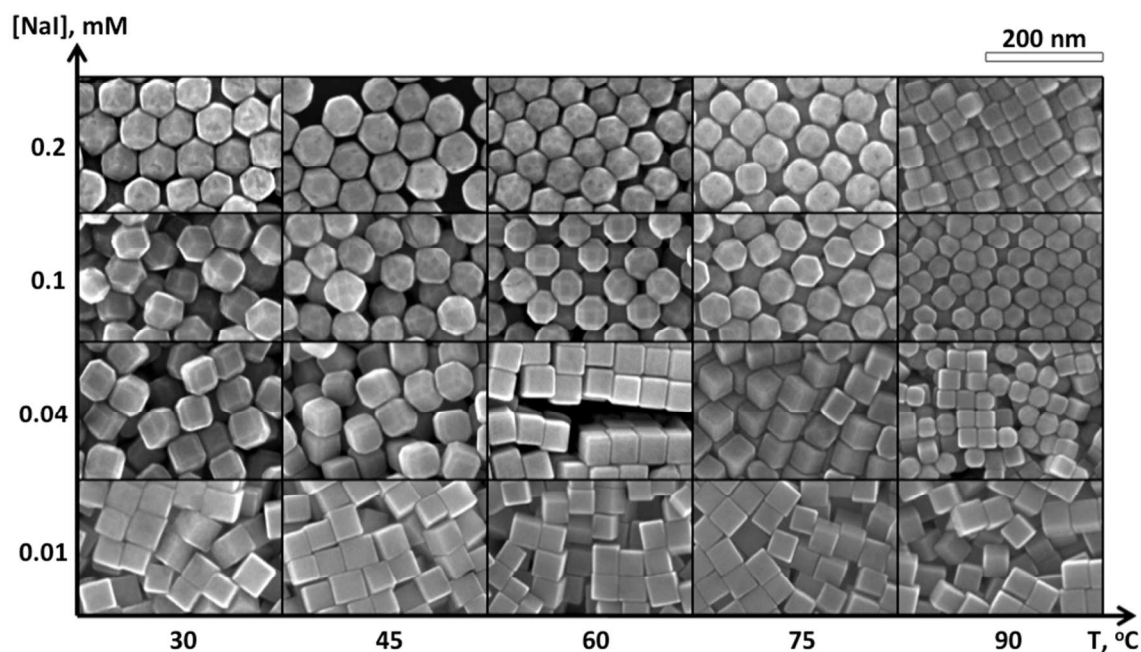


Figure S5. Effect of $[I^-]$ concentration and temperature on nanoparticle shape at 0.1 M CTAB and 0.026 M Pd^{2+} .

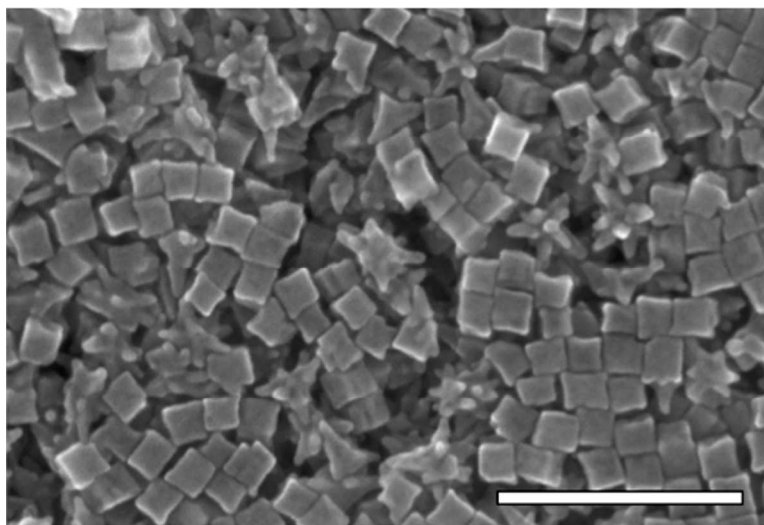


Figure S6. Formation of a mixture of ill-defined protruded nanocubes and branched nanoparticles in the presence of $[Cu^{2+}] = 5$ mM at 0.1 M CTAB and 0.026 M Pd^{2+} . Scale bar is 200 nm.

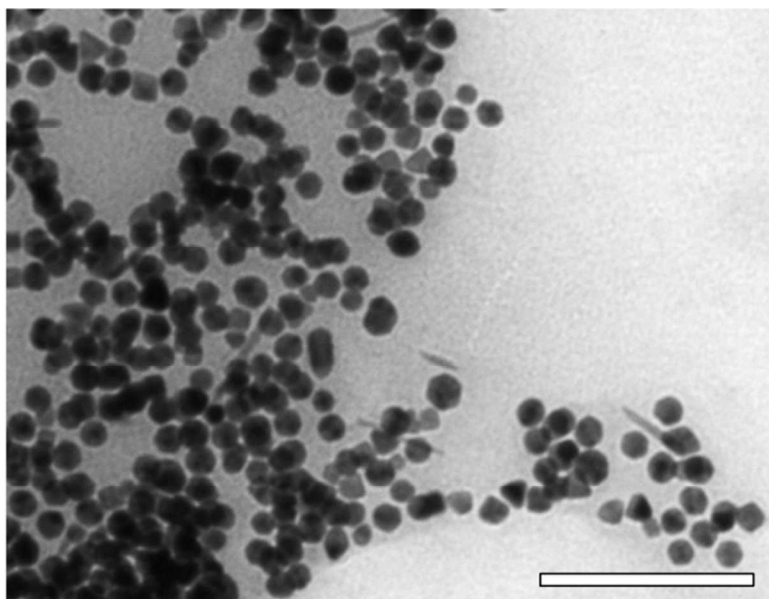


Figure S7. TEM image of 11.6 ± 1.3 nm Pd polygonal seeds used for seed-mediated growth of branched Pd nanoparticles.

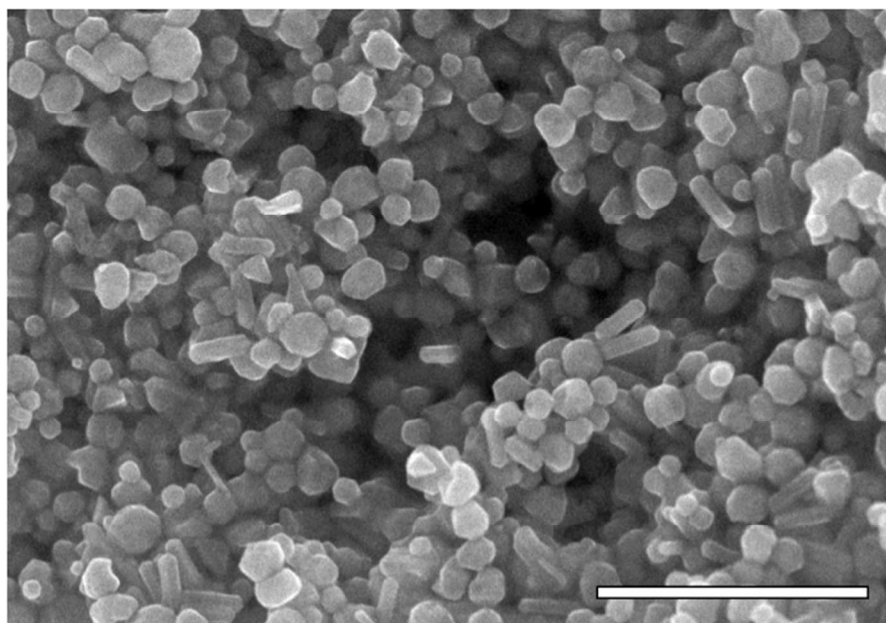


Figure S8. Pd NPs obtained using polygonal Pd seeds in the absence of Cu^{2+} . Scale bar 500 nm.

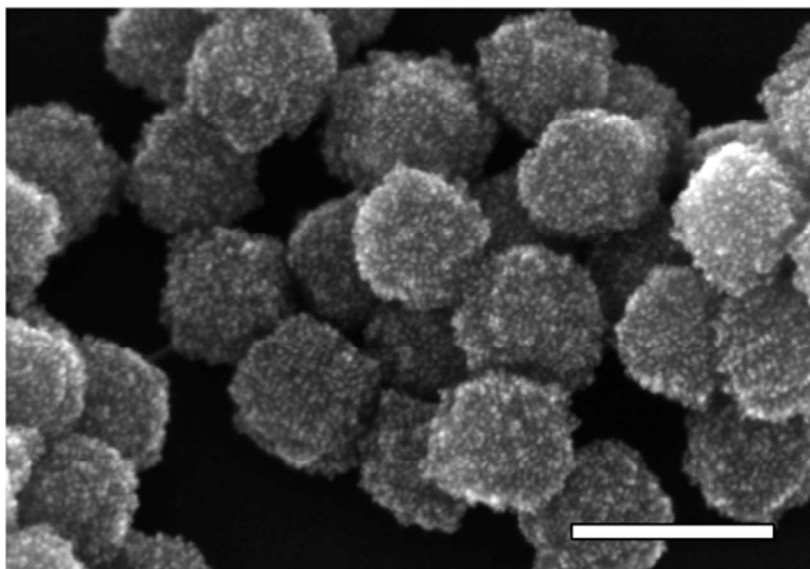


Figure S9. Pt NPs obtained using cubic Pd seeds. Scale bar is 100 nm.

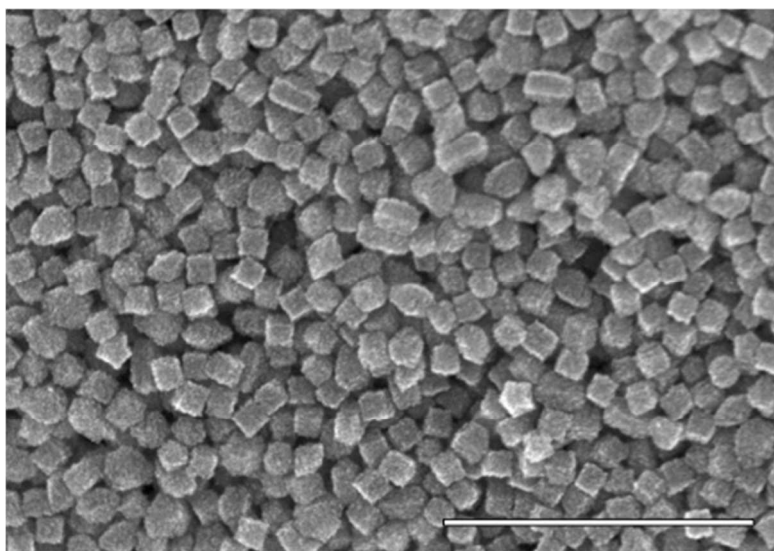


Figure S10. Pt/Pd alloy NCs obtained using cubic Pd seeds. Scale bar is 500 nm.

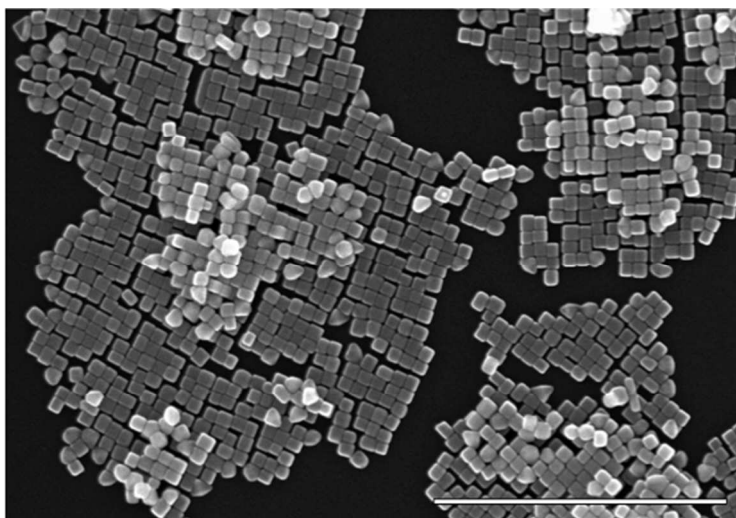


Figure S11. Low magnification SEM image Ag NPs obtained using Pd seeds. Scale bar is 500 nm.

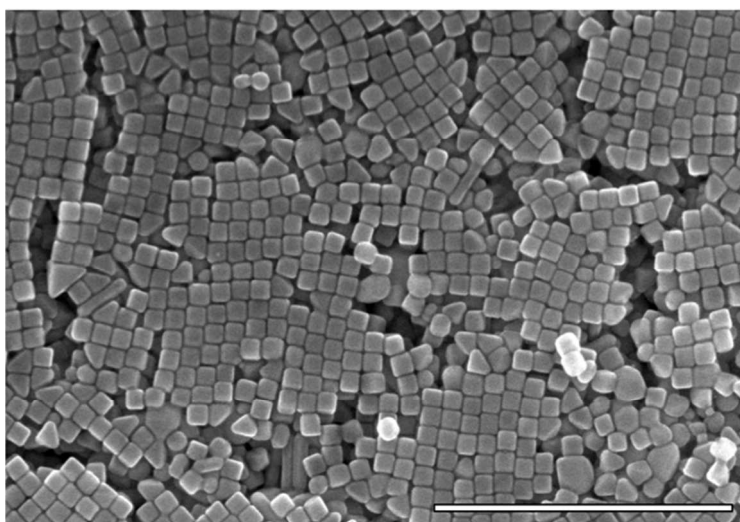


Figure S12. SEM image of Ag NPs obtained using Au seeds. Scale bar is 500 nm.

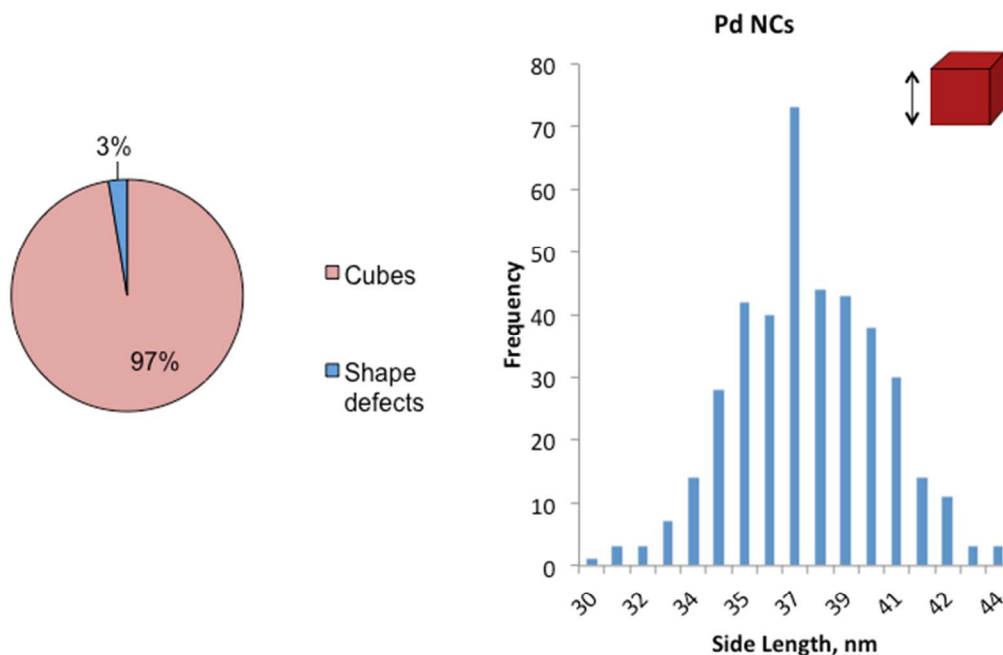


Figure S13. Shape purity (left) and size distribution (right) histograms for Pd NCs obtained from SEM image analysis. For shape purity and size distribution, at least 1000 and 400 NPs were analyzed, respectively, from at least 5 areas on the sample SEM grid.

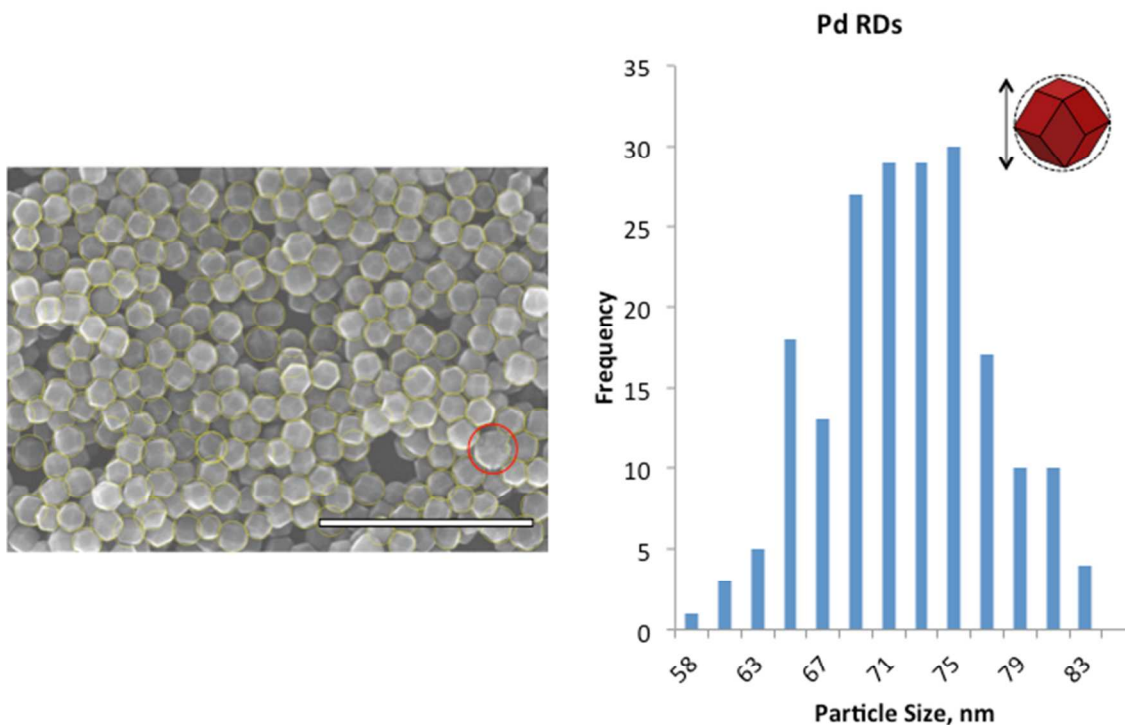


Figure S14. Size distribution determination for Pd RDs obtained from SEM image analysis. Left: SEM image illustrating the measurement of NP size by fitting a NP into

a circle (shown with yellow color) and measuring its diameter. Red circle shows a shape impurity in the sample. Scale bar is 500 nm. Right: size distribution histogram. For shape purity (96%) and size distribution, at least 300 and 200 NPs were analyzed, respectively, from at least 5 areas on the sample SEM grid.

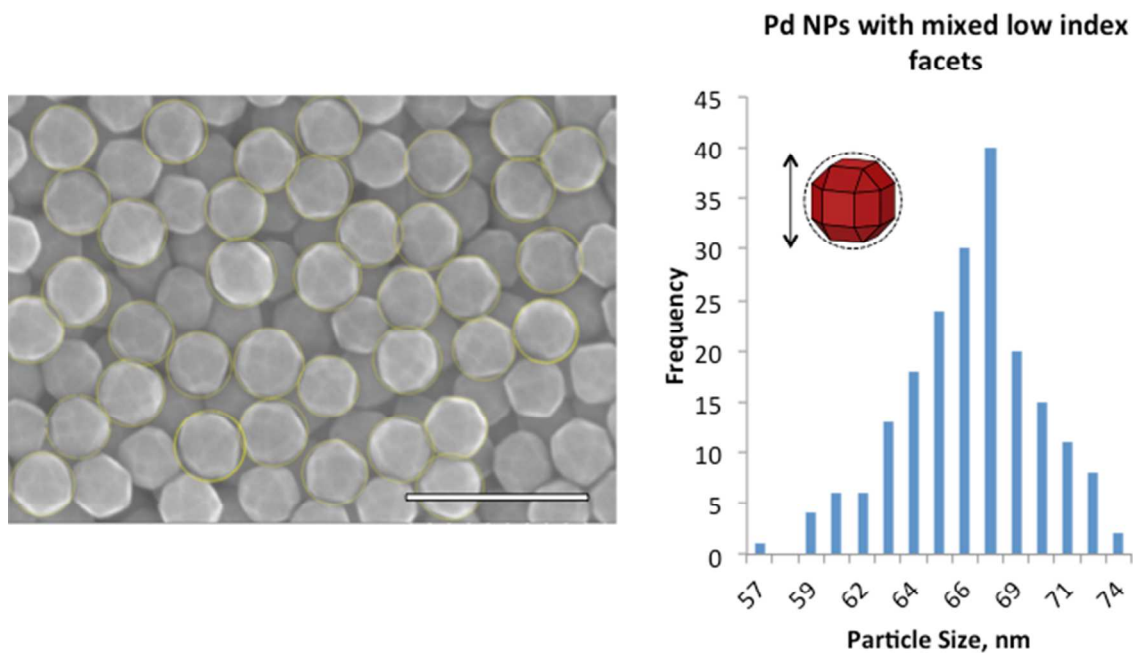


Figure S15. Size distribution determination for Pd NPs with mixed low index facets obtained from SEM image analysis. Left: SEM image illustrating the measurement of NP size by fitting a NP into a circle (shown with yellow color) and measuring its diameter; scale bar is 200 nm. Right: size distribution histogram. For shape purity (95%) and size distribution, at least 300 and 200 NPs were analyzed, respectively, from at least 5 areas on the sample SEM grid.

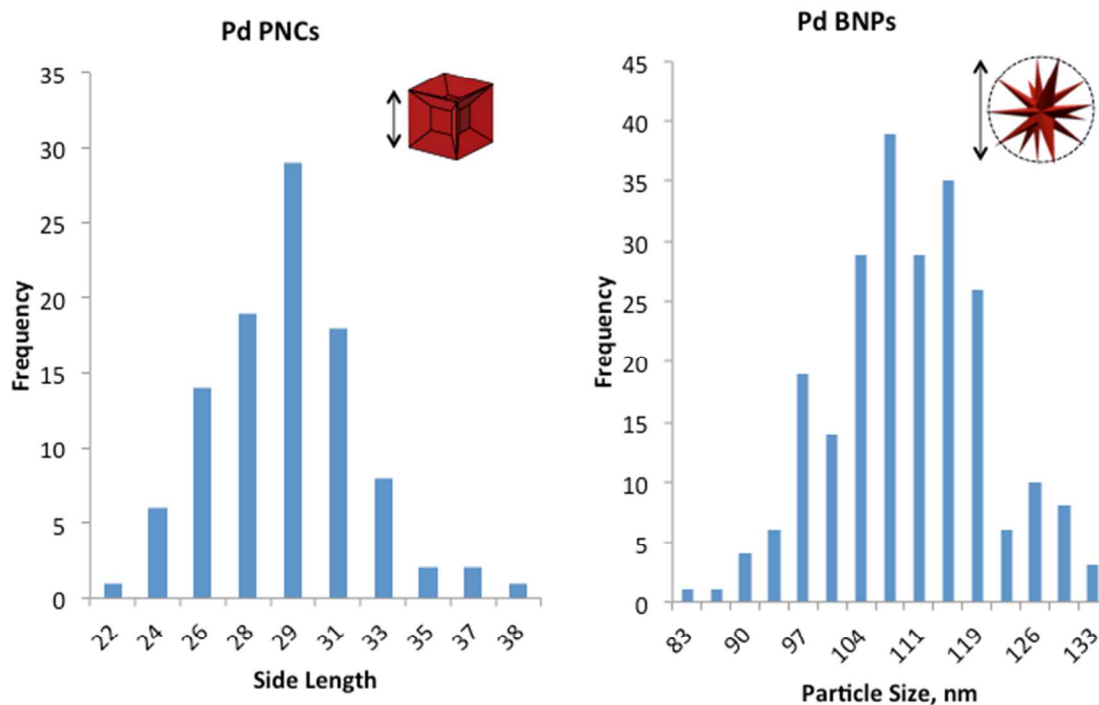


Figure S16. Size distribution histograms for Pd PNCs (left) and Pd BNPs (right) obtained from SEM image analysis. For shape purity (60% for PNCs and 95% for BNPs) and size distribution, at least 300 and 200 NPs were analyzed, respectively, from at least 5 areas on the sample SEM grid.

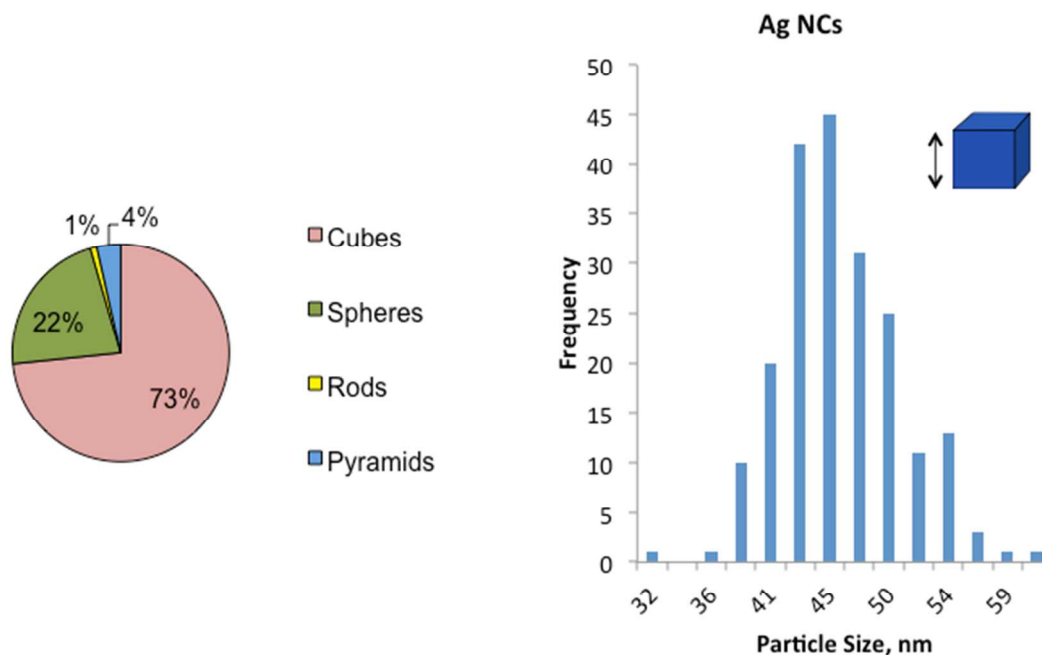


Figure S17. Shape purity (left) and size distribution (right) histograms for Ag NCs obtained from SEM image analysis. For shape purity and size distribution, at least

300 and 200 NPs were analyzed, respectively, from at least 5 areas on the sample SEM grid. Representative SEM image for Ag NCs is shown in Figure S11.

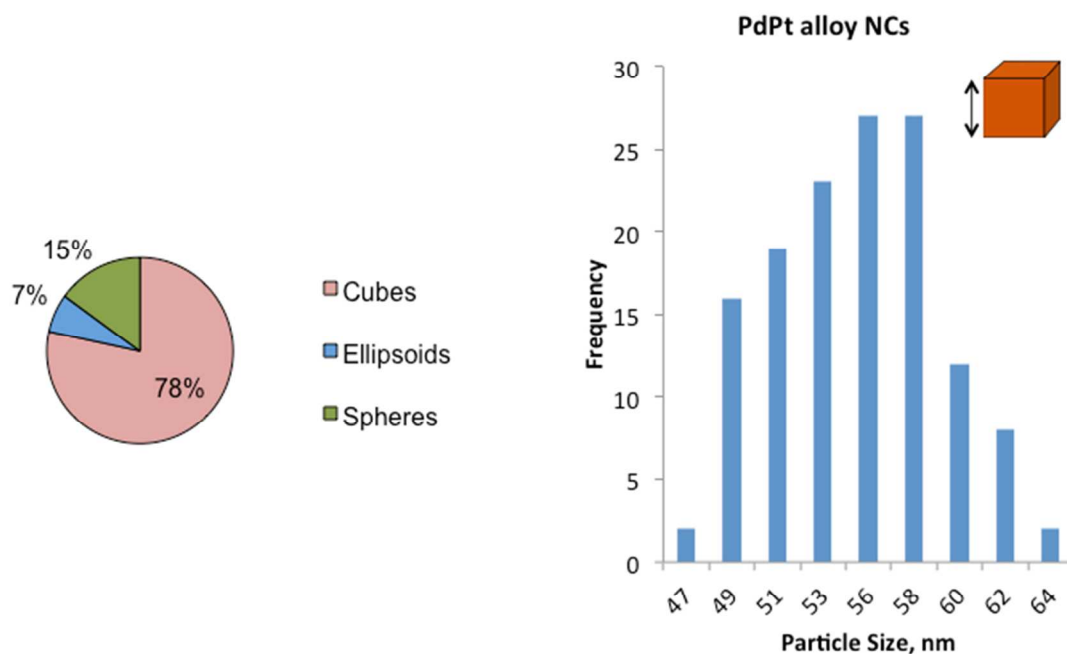


Figure S18. Shape purity (left) and size distribution (right) histograms for Pt/Pd alloy NCs obtained from SEM image analysis. For shape purity and size distribution, at least 300 and 200 NPs were analyzed, respectively, from at least 5 areas on the sample SEM grid. Representative SEM image for Pt/Pd NCs is shown in Figure S10.