Supplementary Information

Shape-directional growth of Pt and Pd nanoparticles

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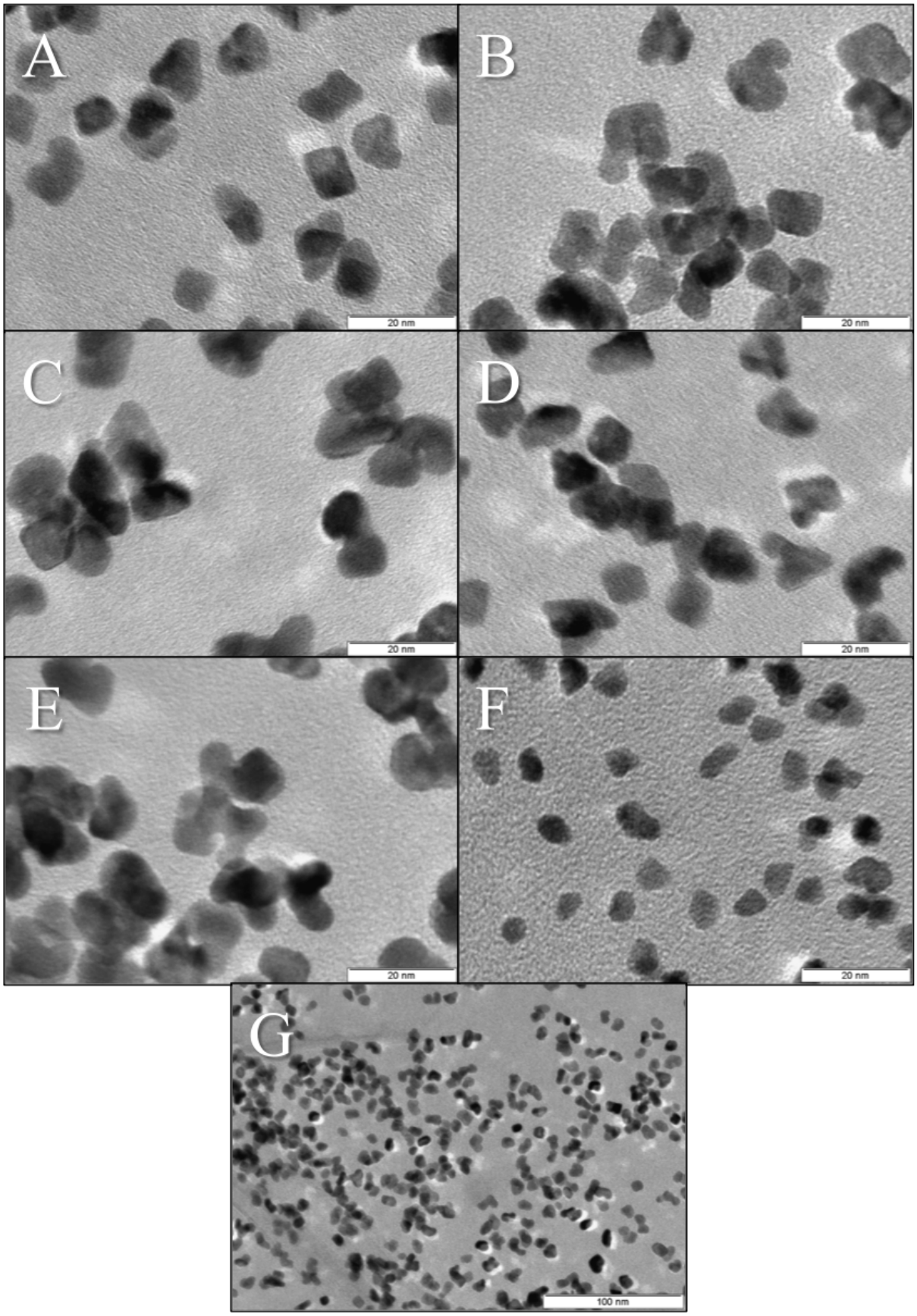
A
20 nm
B
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G
100 nm

Figure S1: TEM images of Pt nanoparticles synthesized from H_2PtCl_6 with a variety of nitrate salts at 10% nitrate to platinum ratios as directing agents. The lack of any consistent faceting in any of the micrographs even at ratios as high as 200% (not shown) is indicative of little to no influence on nanoparticle morphology by nitrate in our synthetic system. $Zn(NO_3)_2$ (A), $NiNO_3$ (B), $NaNO_3$ (C), $Fe(NO_3)_3$ (D), $Mg(NO_3)_2$ (E), KNO_3 (F), and $Ce(NO_3)_3$ (G).

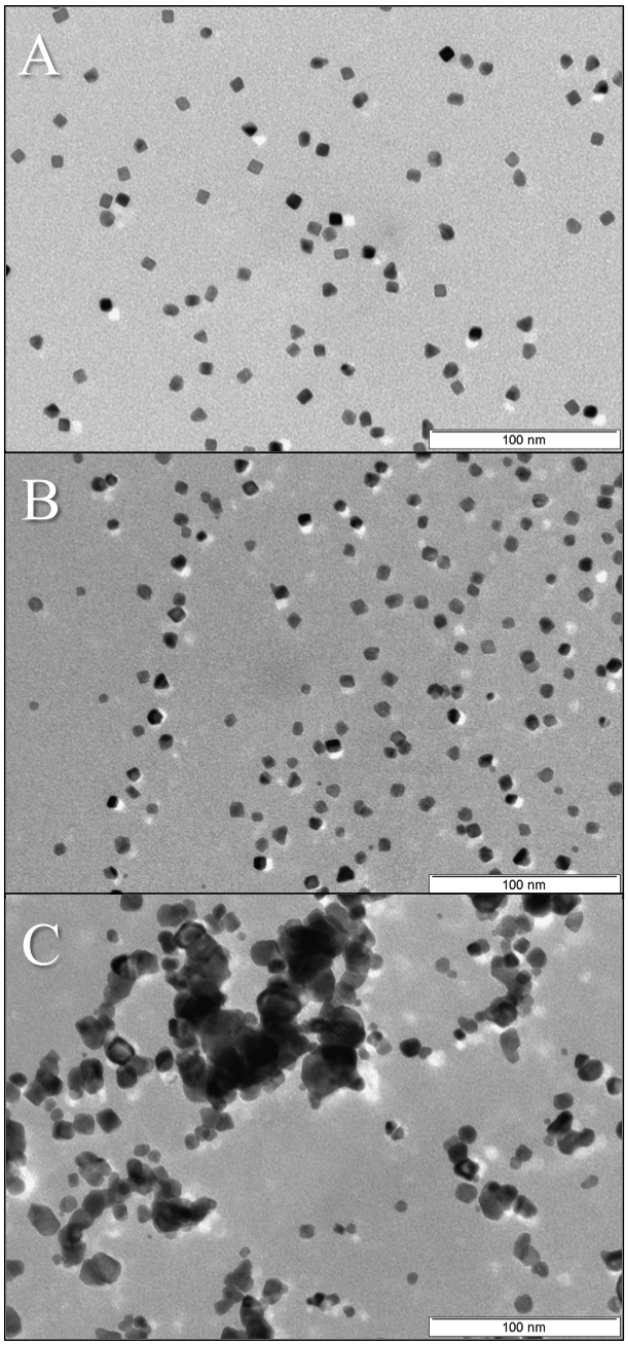

Figure S2: TEM images of Pt nanoparticles synthesized from H_2PtCl_6 with a variety of silver salts at various concentrations as shape directing agents. The regularly shaped Pt nanoparticles in panels (A) and (B) support the hypothesis that silver can direct shape of platinum

nanoparticles. The large agglomerated shapes in panel (C) are attributed to the presence of iodine, as also supported by Figure S3(D). 11% AgBr (A), 200% AgF (B), and 200% AgI (C).

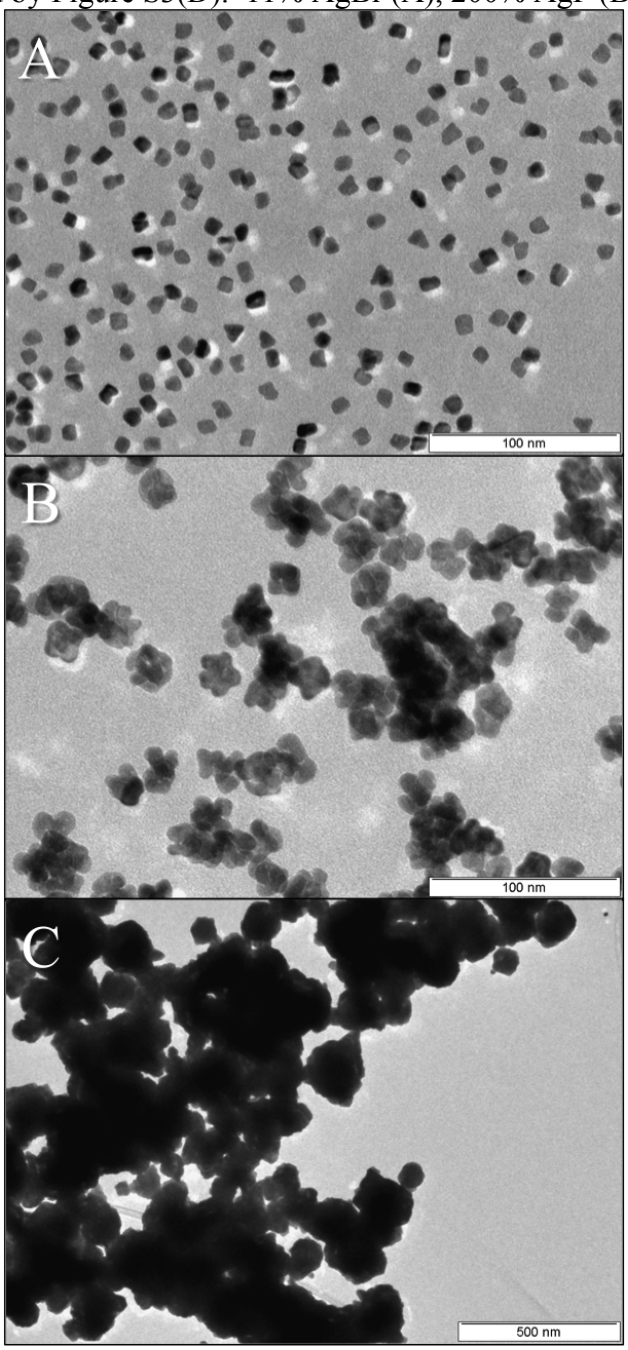

Figure S3: TEM images of Pt nanoparticles synthesized from H_2PtCl_6 with a variety of salts with neither silver nor nitrate. At low concentrations (~10% ratio with Pt) of bromide salts (both NaBr and KBr), semi-shaped nanoparticles are produced as seen in panel (A). At high concentrations (>50%) of both bromide salts, particle agglomeration is observed as seen in panel (B). At any concentration of NaI, sever particle agglomeration is observed as seen in panel (C). Lack of significant particle shaping from these salts supports hypothesis that silver plays significant role indirect nanoparticle shape in our system. 10% NaBr (A), 50% KBr (B), and 10% NaI (C).

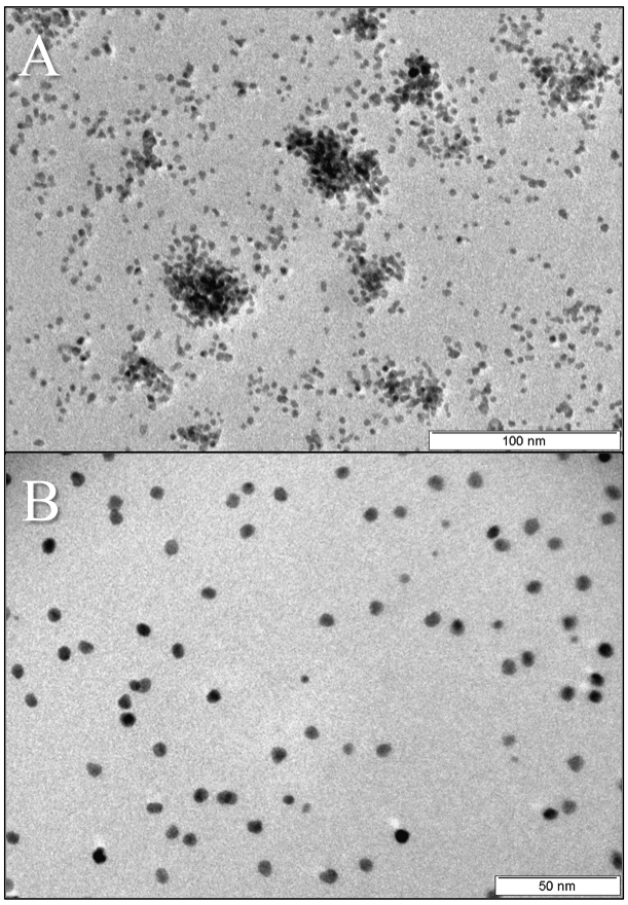

Figure S4: TEM images of Pt nanoparticles synthesized from H_2PtCl_6 with copper salts as shape directing agents. The lack of significant particle shapes from either copper salt used at a broad range of concentrations (1%-200%) indicated that copper does not have similar shape directing properties to silver, despite some chemical similarities. $Cu(NO_3)_2$ (A) and CuBr (B).