

Supporting Information

Site-selective growth of Ag nanocubes for sharpening their corners and edges, followed by elongation into nanobars through symmetry reduction

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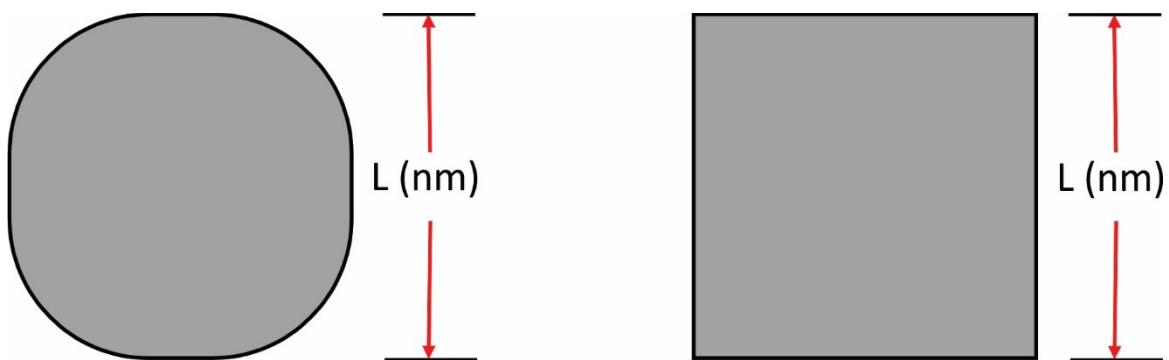


Fig. S1. Illustration showing the definition of size (L) for a truncated nanocube and a nanocube with sharp corners and edges.

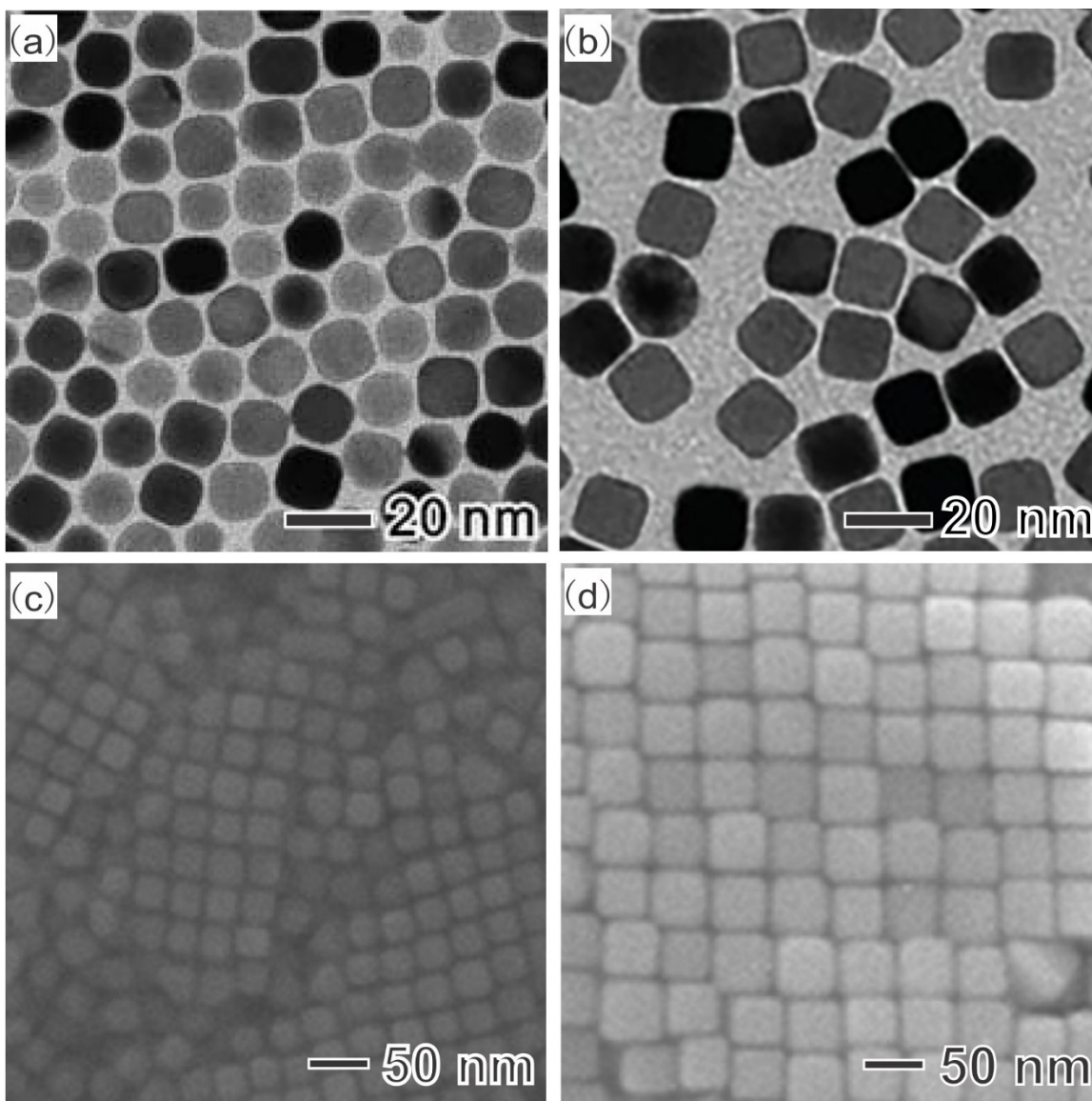


Fig. S2. Comparison of Ag nanocubes reported in literature, which were synthesized using different protocols. (a) TEM image of the Ag nanocubes with an edge length of 14 nm synthesized in isoamyl ether with Fe(III) as an oxidative etchant. Reproduced from Ref. 16 with permission from the Royal Society of Chemistry. (b) TEM image of the Ag nanocubes with an edge length of 13 nm obtained using a Br⁻-mediated polyol method. Reprinted with permission from Ref 7. Copyright © 2016 American Chemical Society. (c and d) SEM image of the Ag nanocubes with edge lengths of (c) 23 nm and (d) 43 nm, respectively, obtained using seed-mediated growth in an aqueous system. Reprinted by permission of John Wiley & Sons, Inc from Ref 13. Copyright © 2016 by John Wiley & Sons, Inc. It is worth noting that all these Ag nanocubes suffer from severer truncation at corners and edges than the Ag nanocubes reported in the present work.

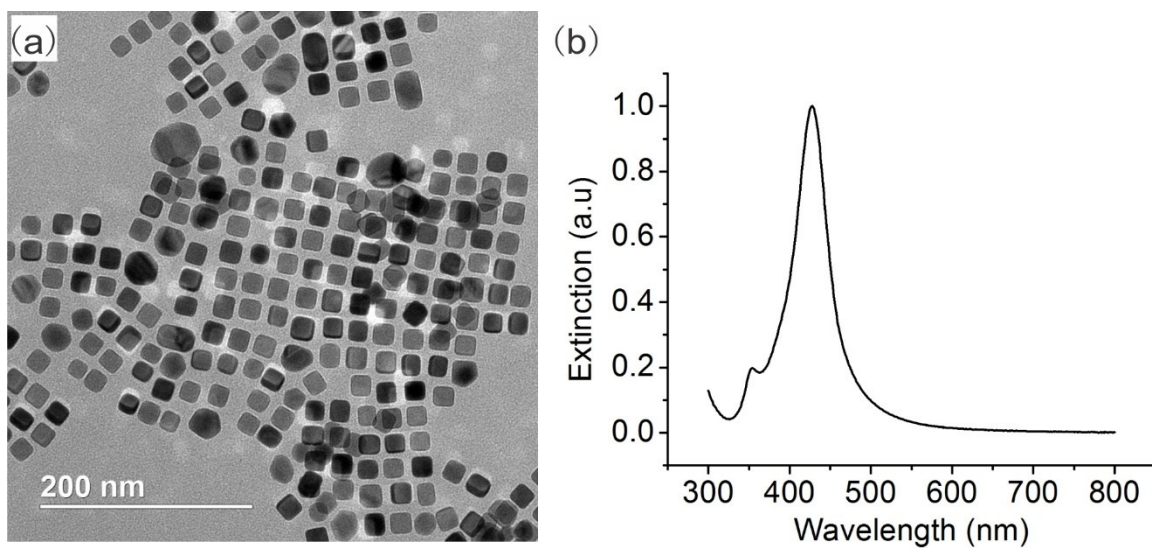


Fig. S3. (a) TEM image of the Ag nanocubes synthesized with the introduction of 20 mM CTAC solution. The sample was collected at 6 days into the reaction. Most particles still maintained a cubic shape with slightly truncated corners and edges. The large, irregular AgCl particles were formed from the Ag⁺ derived from oxidation. (b) UV-vis spectrum recorded from an aqueous suspension of the Ag nanoparticles.

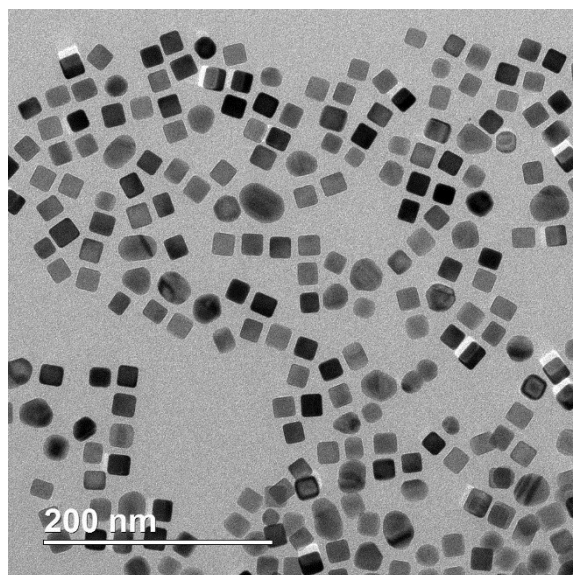


Fig. S4. TEM image of the Ag nanocubes synthesized under room light. The sample was collected at 24 h into the reaction. The percentages of twinned particles and small single-crystal particles were higher than the sample presented in [Fig. 1c](#).

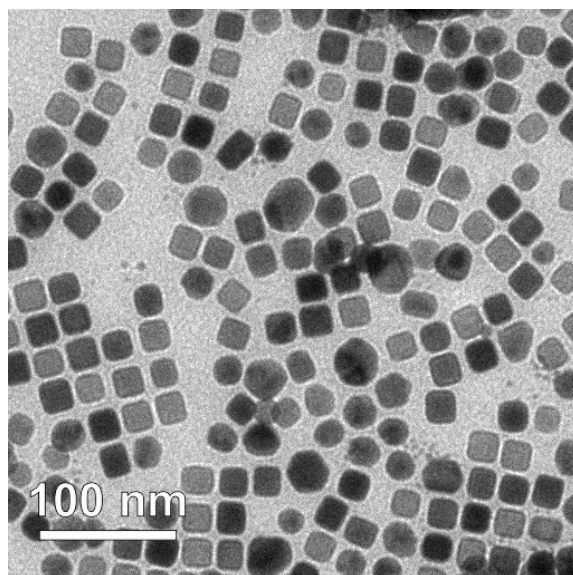


Fig. S5. TEM image of the Ag nanocubes synthesized using AgNO_3 instead of CF_3COOAg . The sample was collected at 24 h into the reaction.



Fig. S6. Photograph showing a comparison of two different reaction solutions: (left) a standard synthesis and (right) a synthesis with the introduction of NaCl instead of CTAC. When replacing CTAC with NaCl, severe aggregations were observed in the reaction solution.

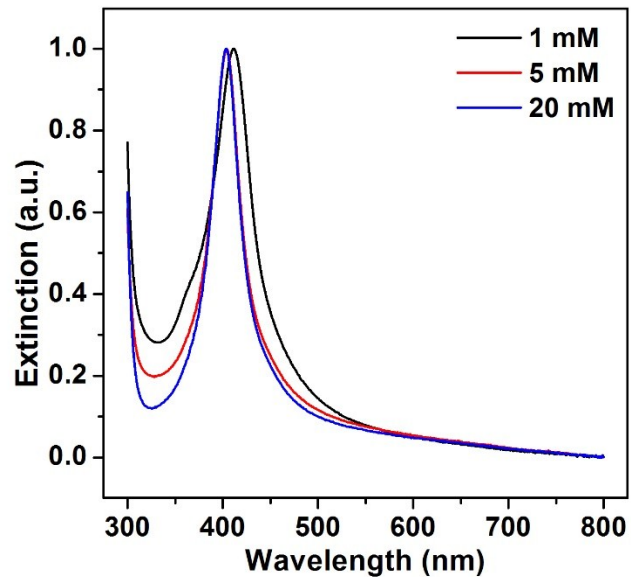
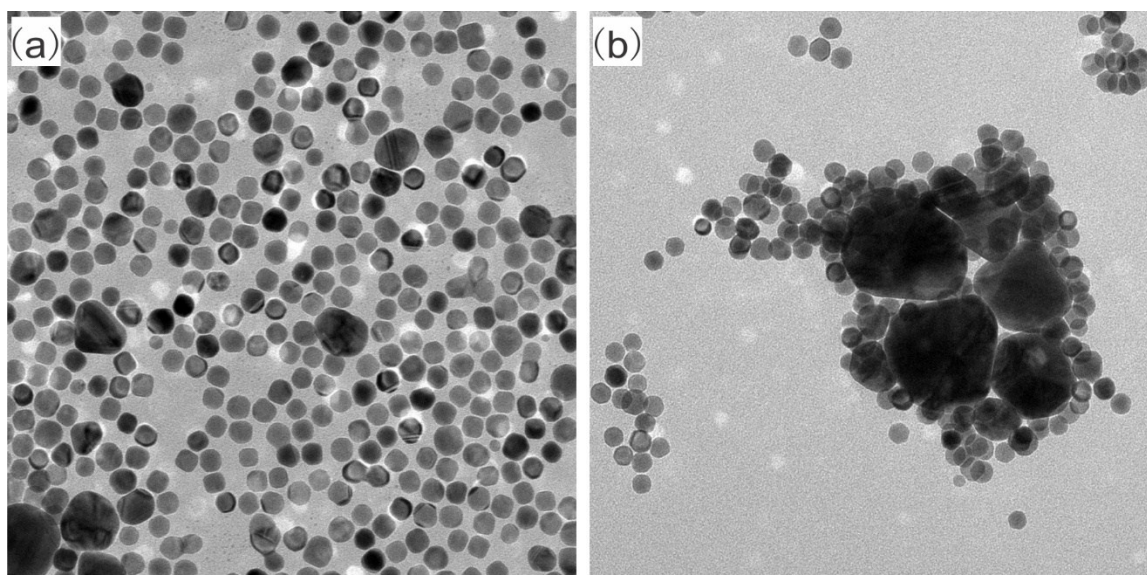


Fig. S7. Normalized UV-vis spectra recorded from aqueous suspensions of the Ag nanoparticles synthesized with the introduction of CTAB solutions at different concentrations as shown in [Fig. 3a, c, and e](#).



— 50 nm

Fig. S8. TEM images showing Ag nanoparticles synthesized using seed-mediated growth with the addition of 20 mM PVP-55k solution. The samples were collected at (a) 12 h and (b) 24 h, respectively, into the reaction. All the small Ag nanoparticles had a cuboctahedral shape. The aggregation of Ag nanoparticles became severer with the elongation of reaction time. The average sizes of the cuboctahedral Ag nanoparticles are (a) 18.5 ± 1.3 and (b) 18.9 ± 1.6 nm, respectively.