Electronic Supplementary Material (ESI) for Materials Chemistry Frontiers.

Electronic Supplementary Information (ESI)

Anion Replacement in Silver Chlorobromide Nanocubes: Two Distinct Hollowing Mechanisms

Sasitha C. Abeyweera, Shea Stewart and Yugang Sun*

Department of Chemistry, Temple University, 1901 North 13th Street, Philadelphia, Pennsylvania 19122, USA.

Corresponding Author

*E-mail: ygsun@temple.edu

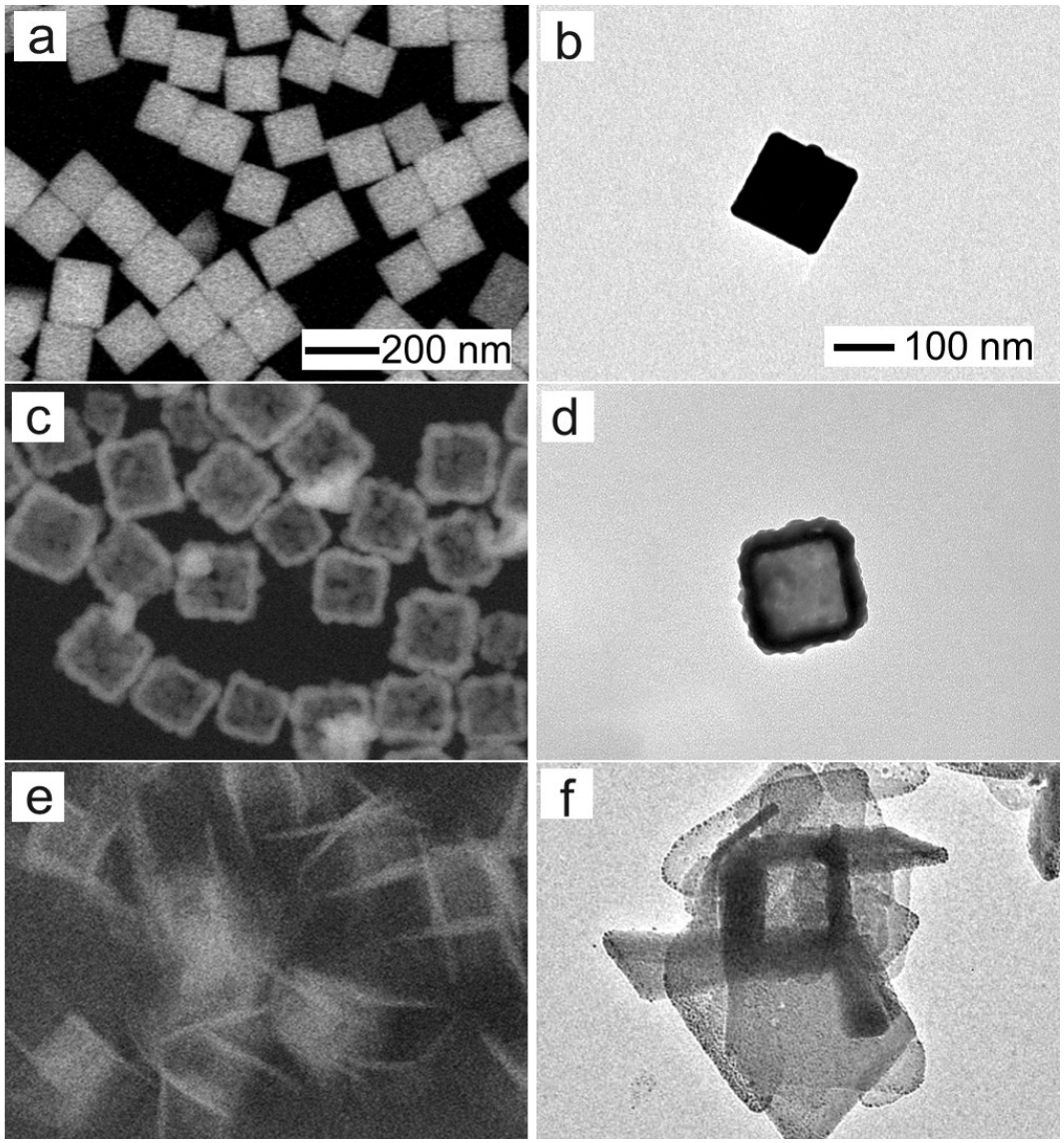

Fig. S1 (a, c, e) Backscattered electron SEM images and (b, d, f) TEM images of (a, b) the template $AgCl_{0.5}Br_{0.5}$ nanocubes, the corresponding (c, d) hollow Ag_2S nanoshells and (e, f) hollow AgBT nanoshells. The scale bar of (a) applies to (c, e) and the scale bar in (b) applies to (d, f). The imaging contrast and dimensions of nanoparticles and nanoshells are highly consistent between the SEM and TEM image. The existence of small black dots with various sizes at the edges of individual AgBT nanoplates in the TEM image (f) indicates the possible damage caused in TEM characterization.

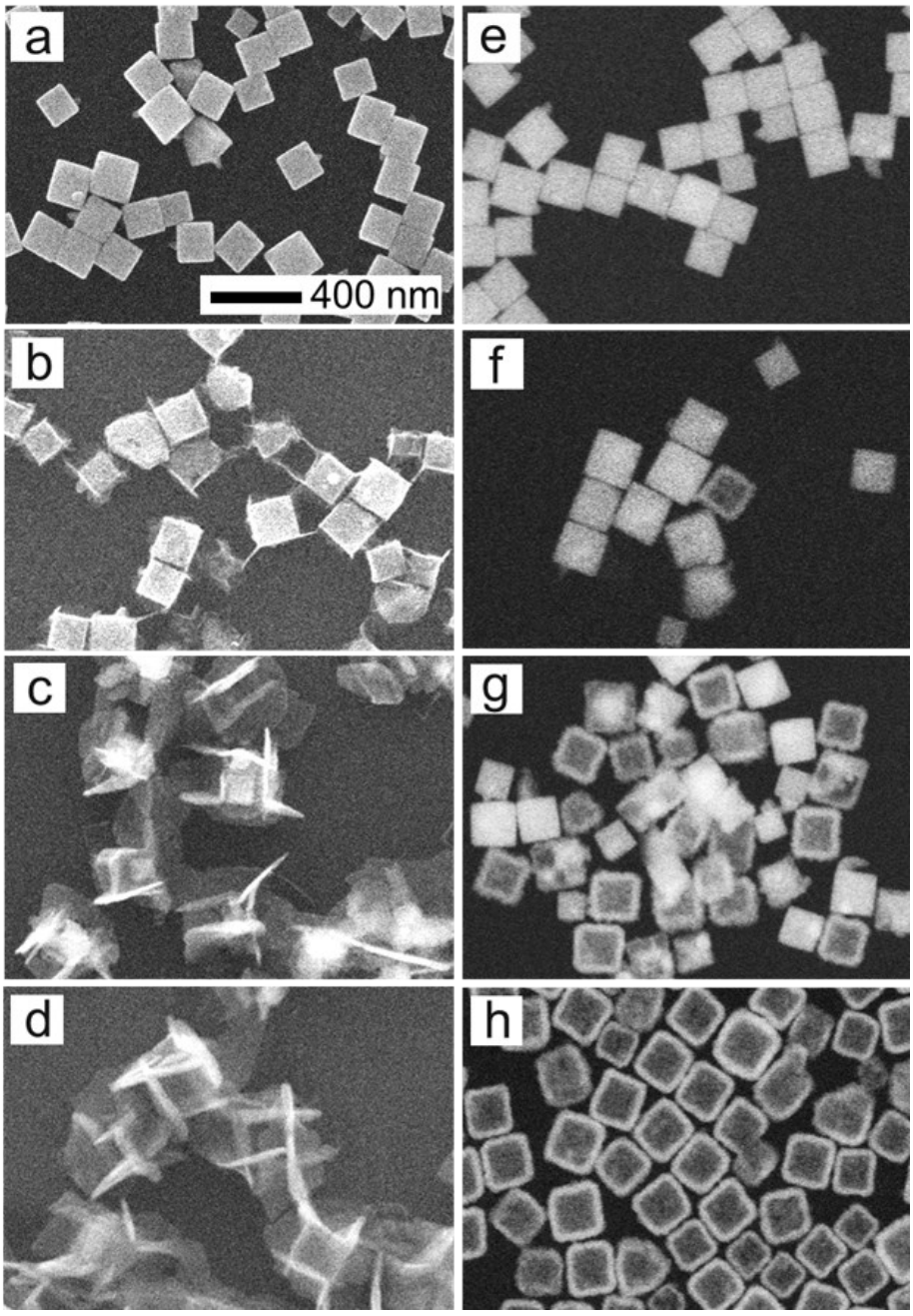

Fig. S2 (a-d) SEM images (a) $AgCl_{0.5}Br_{0.5}$ nanocubes and the corresponding products formed from the reaction between the $AgCl_{0.5}Br_{0.5}$ nanocubes and HBT at different reaction times: (b) 1 min, (c) 10 min, and (d) 60 min. (e-h) Back scattered electron SEM images of (b) $AgCl_{0.5}Br_{0.5}$ nanocubes and the corresponding products formed from the reaction between the $AgCl_{0.5}Br_{0.5}$ nanocubes and Na_2S at different reaction times: (f) < 5 sec, (g) 15 sec, and (h) 1 min. The scale bar in (a) also applies to all frames.

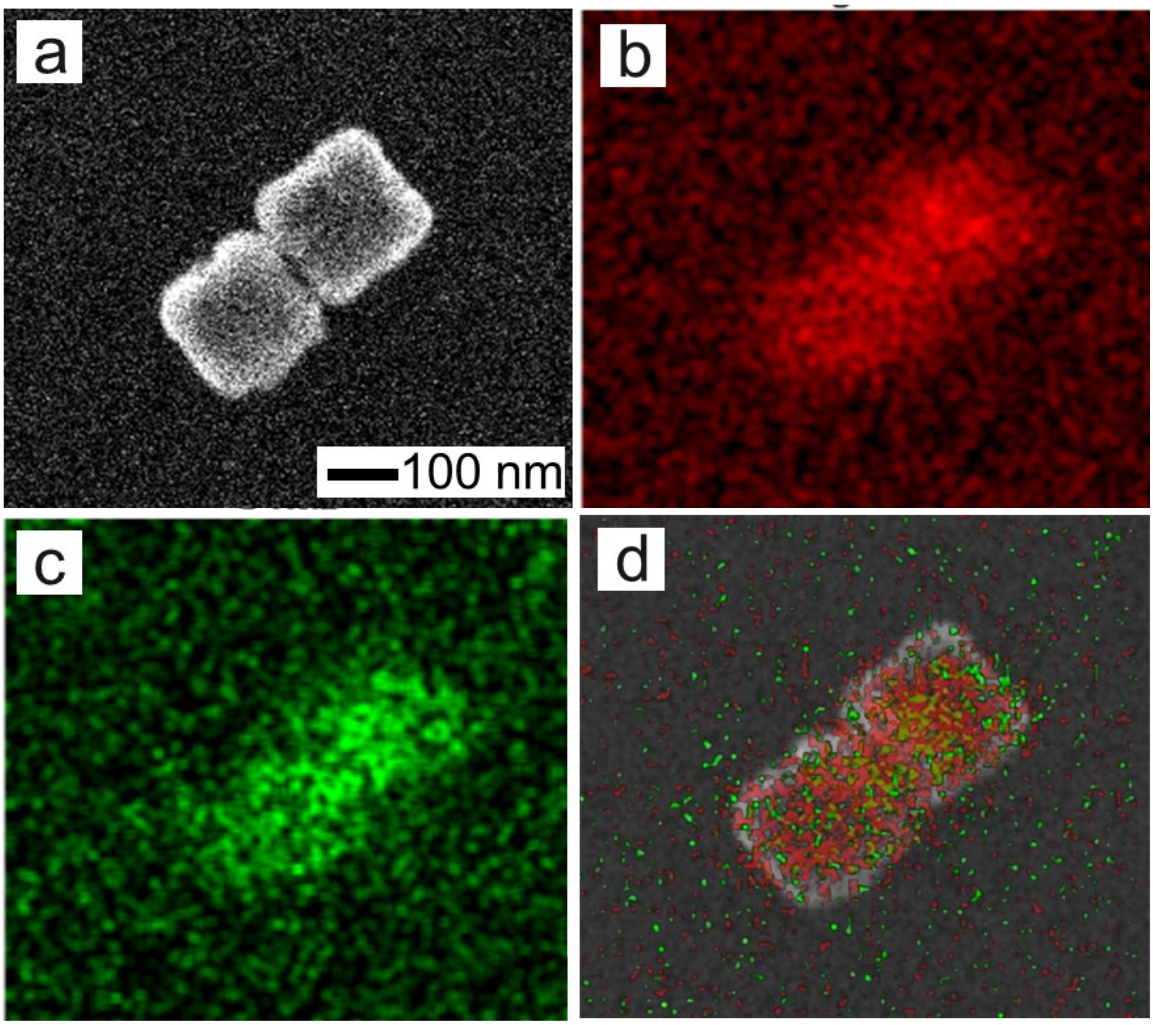

Fig. S3 (a) SEM image of hollow Ag_2S nanoshells, EDS element mapping of both (b) Ag (red), (c) S (green), and (d) the overlay of Ag and S spectra on the SEM image.

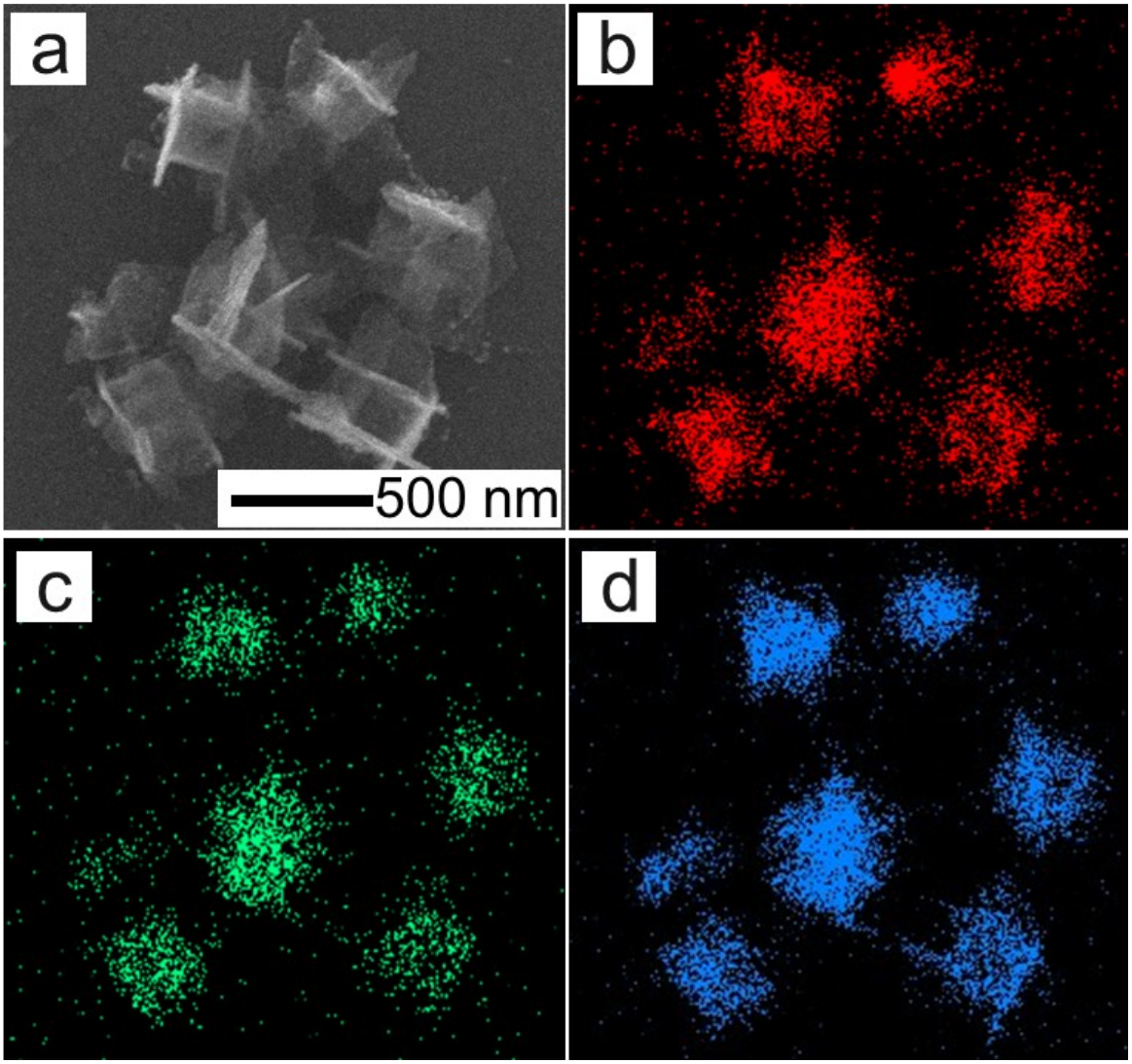

Fig. S4 (a) SEM image of hollow AgBT nanoshells and the corresponding EDS element mapping of individual elements: (b) Ag, (c) S, and (d) C.

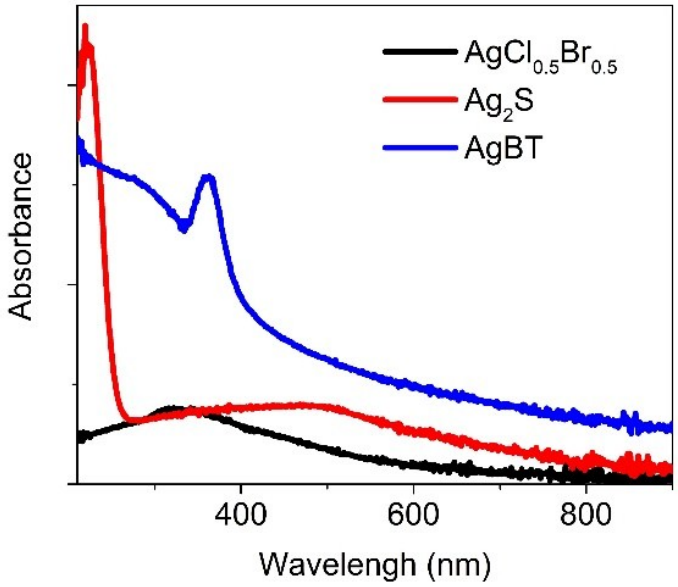

Fig. S5 UV-visible absorption spectra of dispersions of $AgCl_{0.5}Br_{0.5}$ nanocubes (black), hollow Ag_2S nanoshells (red), and hollow AgBT nanoshells (blue).

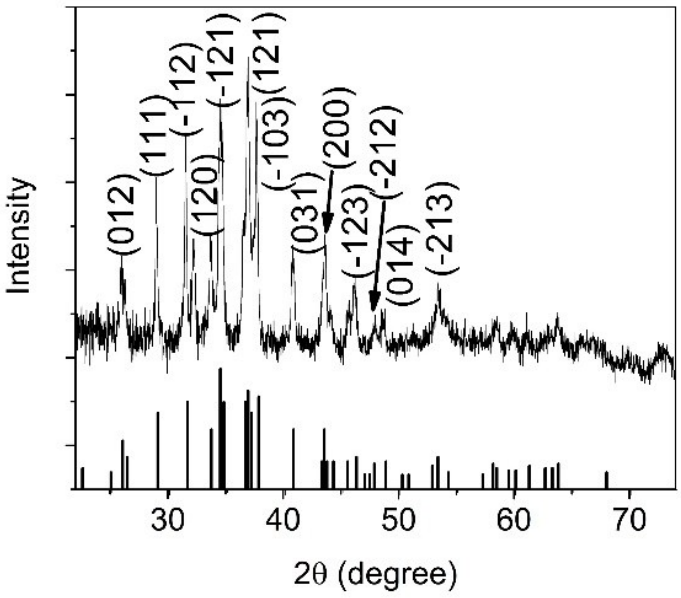

Fig. S6 XRD pattern of freestanding Ag_2S nanoparticles that were used as control experiment of photocatalysis.

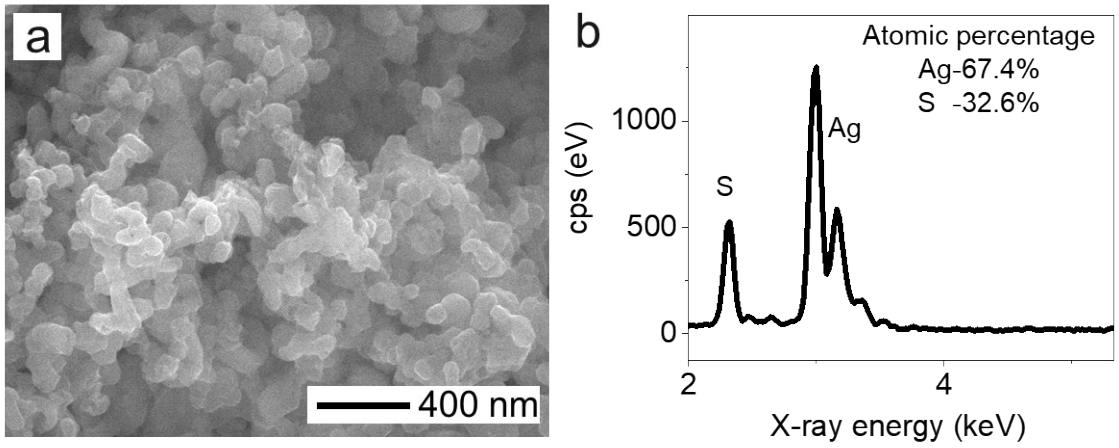

Fig. S7 (a) SEM image and (b) EDS element analysis of the Ag_2S nanoparticles after the use in photocatalytic reaction. The result of EDS analysis indicates that the atomic ratio of Ag to S still maintained at 2:1, consistent with the stoichiometric composition of Ag_2S.