Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Electronic Supplementary Information

Silver Chlorobromide Nanoparticles with Highly Pure Phases: Synthesis and Characterization

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Table S1 Summary of the composition (x), the average hydrodynamic size, the zeta potential, and the indirect bandgap energy (E_g^i) of the $AgCl_xBr_{1-x}$ nanoparticles synthesized with different [CTAC]/([CTAC]+[CTAB]) ratios.

[CTAC]/([CTAC]+[CTAB])	x	size (nm)	zeta potential (mV)	E_g^i (eV)
8/8	1	410 ± 24.2	69.9 ± 0.7	3.81
7/8	0.85	310.6 ± 9.5	59.7 ± 1.5	3.80
6/8	0.74	330.9 ± 6.8	64.5 ± 0.3	3.80
5/8	0.57	292.3 ± 16.2	62.6 ± 2.1	3.77
4/8	0.47	280.5 ± 26.1	68.7 ± 3.1	3.65
3/8	0.36	209.4 ± 14.3	74.0 ± 1.6	3.58
2/8	0.24	214.2 ± 3.9	67.6 ± 2.6	3.54
1/8	0.11	184.8 ± 8.9	65.1 ± 0.4	3.50
0/8	0	152.9 ± 3.9	61.0 ± 1.8	3.50

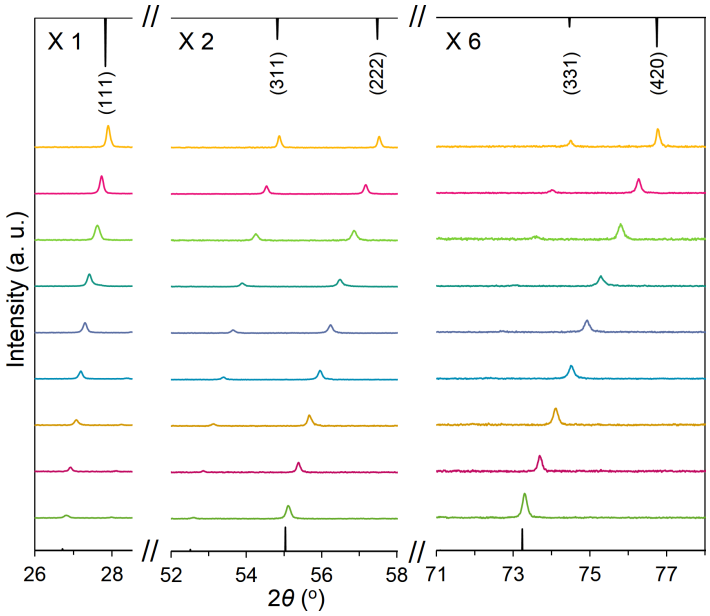

Fig. S1 Enlarged XRD patterns shown in Fig. 1a, highlighting the (111), (311) and (331) peaks. The sticks associated with the bottom and top axes correspond to the positions and relative intensities of the standard XRD patterns of AgBr (JCPDS No. 79-0149) and AgCl (JCPDS No. 85-1355), respectively.

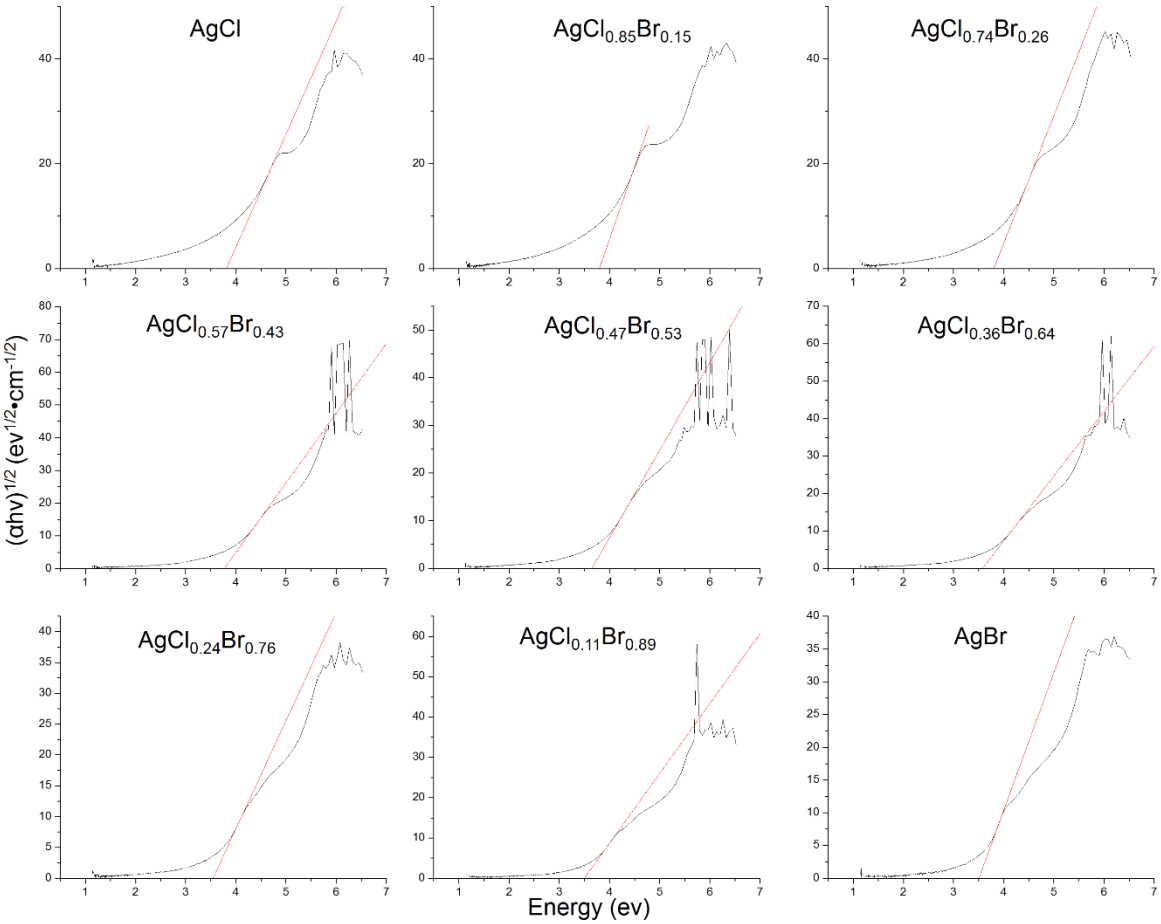

Fig. S2 Plot of $\alpha h\nu^{1/2}$ (eV $^{1/2}$•cm$^{-1/2}$) as a function of photon energy E (eV) and the corresponding linear fitting (red lines).

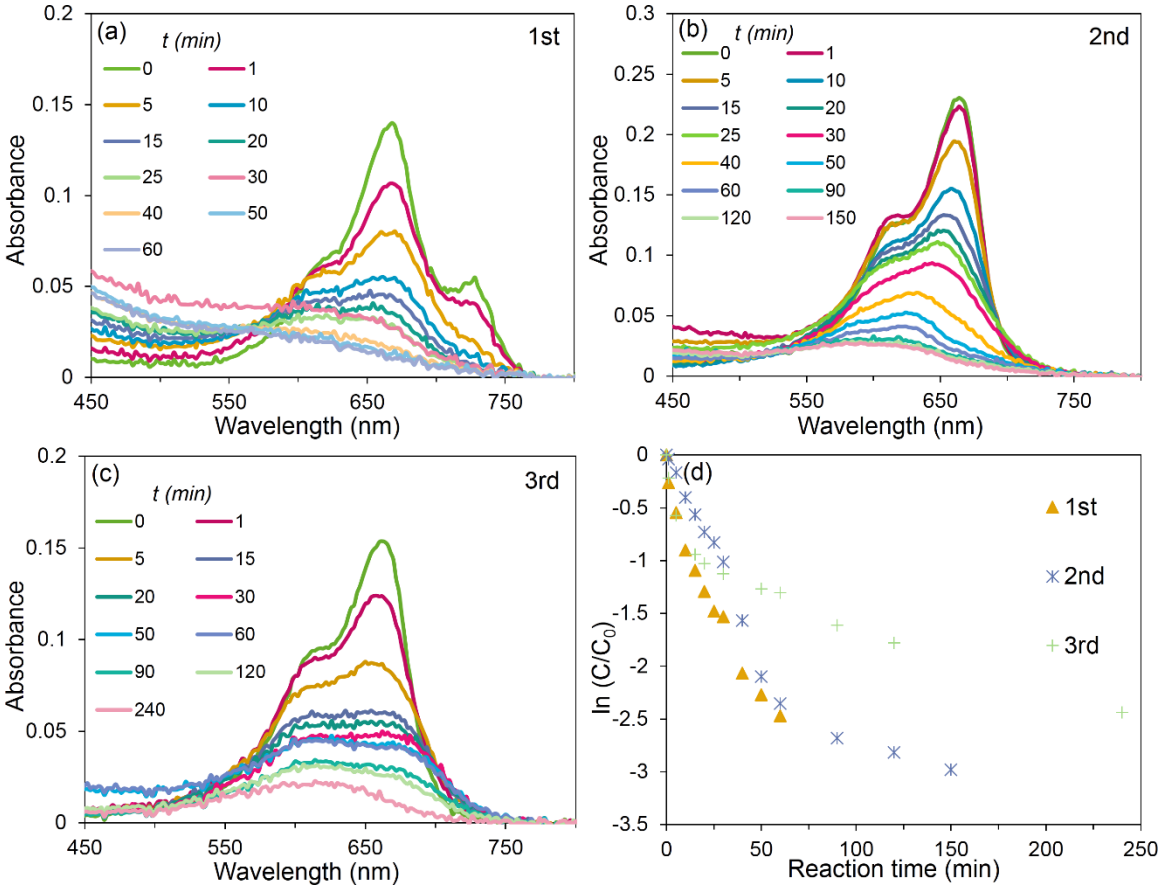

Fig. S3 Absorption spectra of MB molecule at different reaction times after the initiation of photocatalytic decomposition with the assistance $AgCl_{0.47}Br_{0.53}$ in the (a) 1st, (b) 2nd, and (c) 3rd reactions. (d) Normalized concentration of the MB molecule (against the concentration right before initiation of the photocatalytic reactions) as a function of the reaction time.

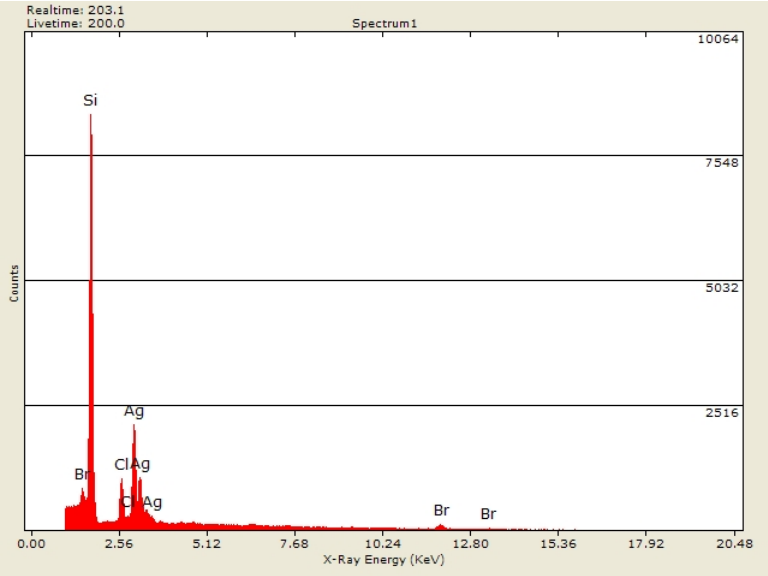

Fig. S4 EDX spectrum of the dried MB supernatant, clearly showing the strong signals of Br, Cl, and Ag that are corresponding to the $AgCl_xBr_{1-x}$ nanoparticles left in the MB solution after recycling. The Si signal originated from the Si wafer, on which the sample was prepared.

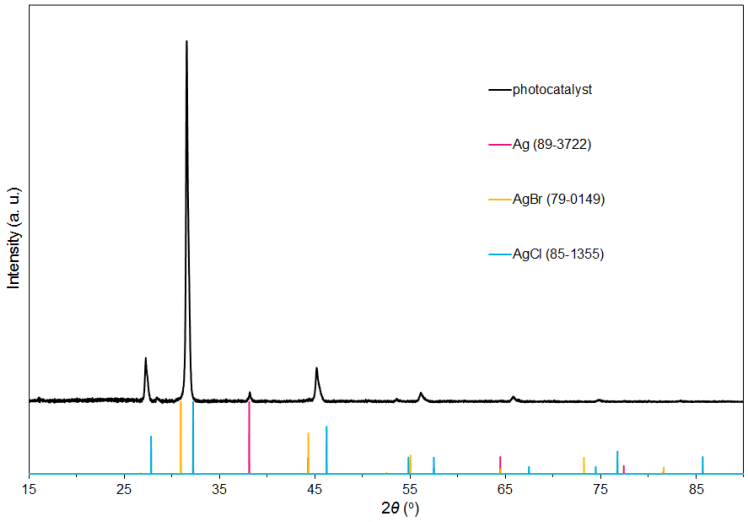

Fig. S5 XRD pattern of the $AgCl_{0.47}Br_{0.53}$ nanoparticles after the use in photocatalytic reactions for three times. The appearance of the Ag (111) peak at 38.2 degree indicates the formation of crystalline metal silver nanodomains.