Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

An exclusive deposition method of silver nanoparticles on TiO_2 particles *via* low-temperature decomposition of silver-alkyldiamine complexes in aqueous media

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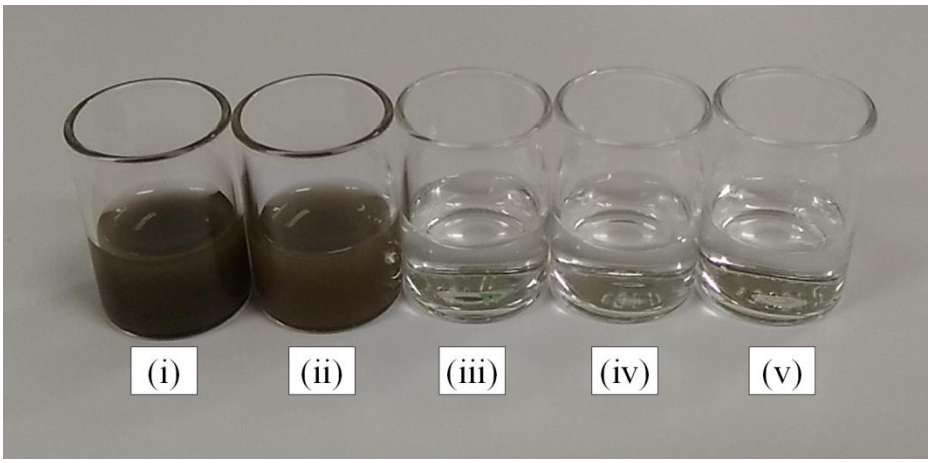

Fig. S1 The photographs of aqueous solutions of $AgNO_3$ in the presence of different molar ratios of dmpda, where the ratios of dmpda to $AgNO_3$ were 1.0 (i), 1.5 (ii), 2.0 (iii), 4.0 (iv) and 8.0 (v) mole/mole. These solutions were aqueous mixtures of water (10 mL), 772 μL of an aqueous solution of $AgNO_3$ (1.00 mol L^{-1}), and the various molar ratios of dmpda.

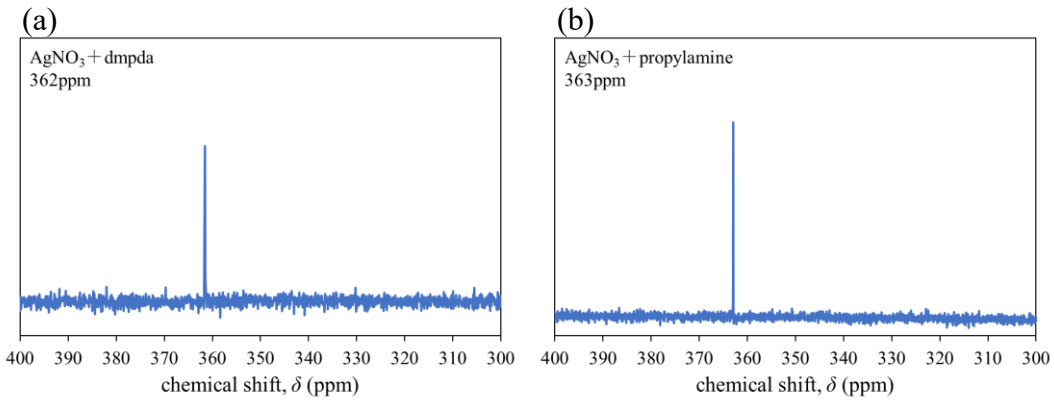

Fig. S2 ^{109}Ag-NMR spectra of a transparent and colourless aqueous mixture of $AgNO_3$ and an alkylamine, dmpda (a) or propylamine (b), with a molar ratio of 1 : 4 mole/mole. The aqueous solution composed of $AgNO_3$ (3.13 mmol), alkylamine (12.5 mmol) and water (4 mL), and D_2O (1 mL) was further added into the aqueous solution as a D-lock solvent. An aqueous solution of $AgNO_3$ without alkylamines shows one signal at 0 ppm which is employed as a standard signal for calibrating chemical shifts (δ) of ^{109}Ag-NMR spectra.

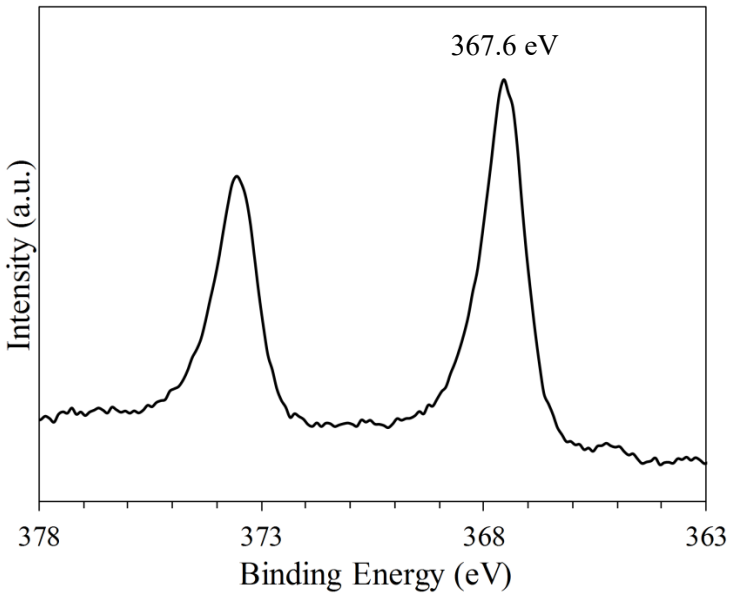

Fig. S3 XPS spectrum derived from the 3d orbitals of Ag in Ag_4/TiO_2 sample.

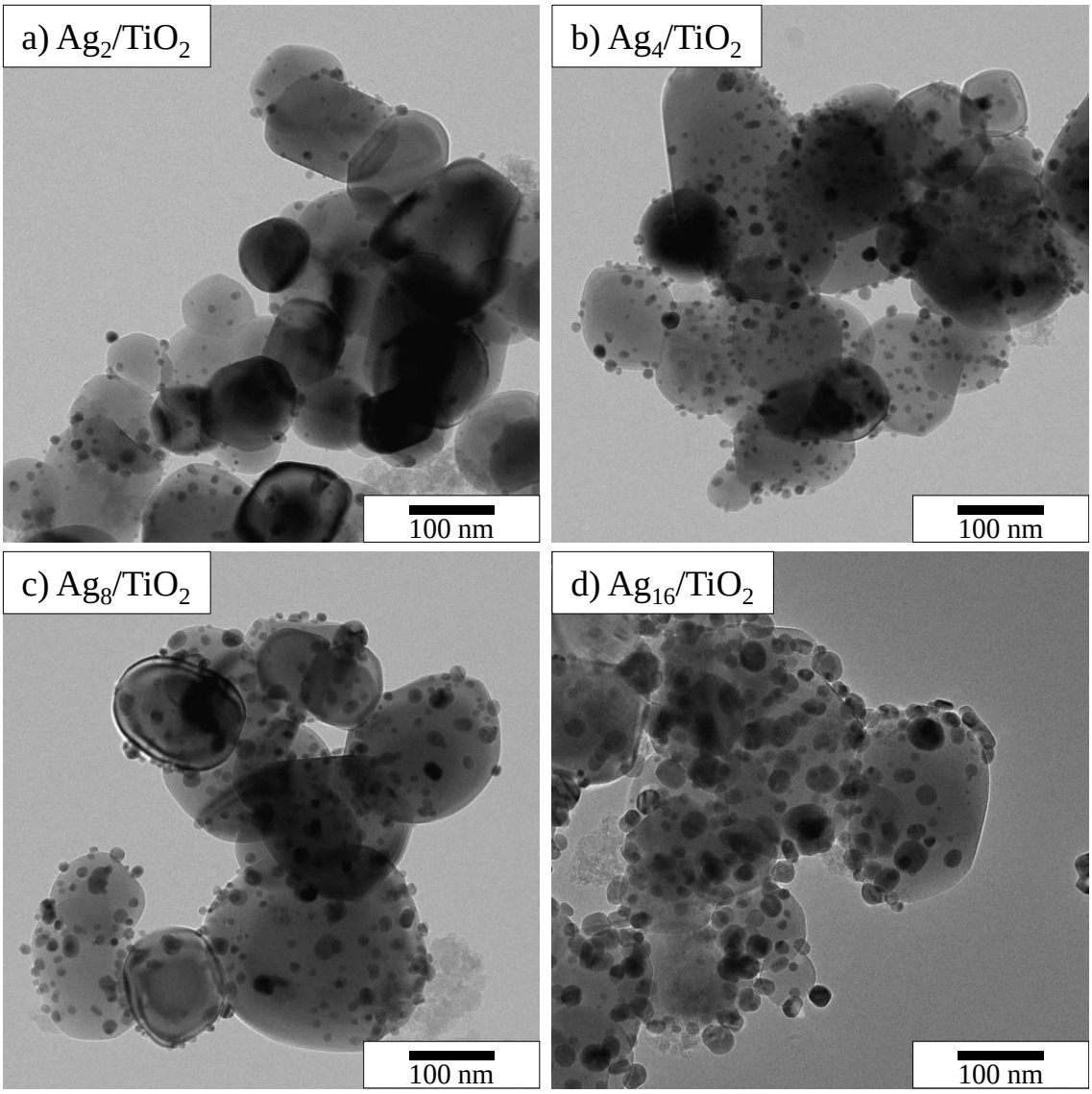

Fig. S4 TEM images of Ag_x/TiO_2 samples after the catalytic reactions in the cases of x = 2 (a), 4 (b), 8 (c) and 16 (d).