Electronic supplementary information

Facile fabrication of Z-scheme g-C_3N_5/Gd-MOF/silver nanocubes composite as new generation visible light active photocatalyst for abatement of persistent toxic pollutants

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Table S1 Effect of Cr^{6+} reduction in presence of varied catalyst amount and Cr^{6+} contaminated industrial raw water

Concentration of Cr^{6+}	Amount of CNGdAg-40 %	Cr^{6+} reduction
10 ppm	20 mg	54 %
	30 mg	98 %
	40 mg	89 %
Cr^{6+} contaminated industrial raw water	30 mg	66 %

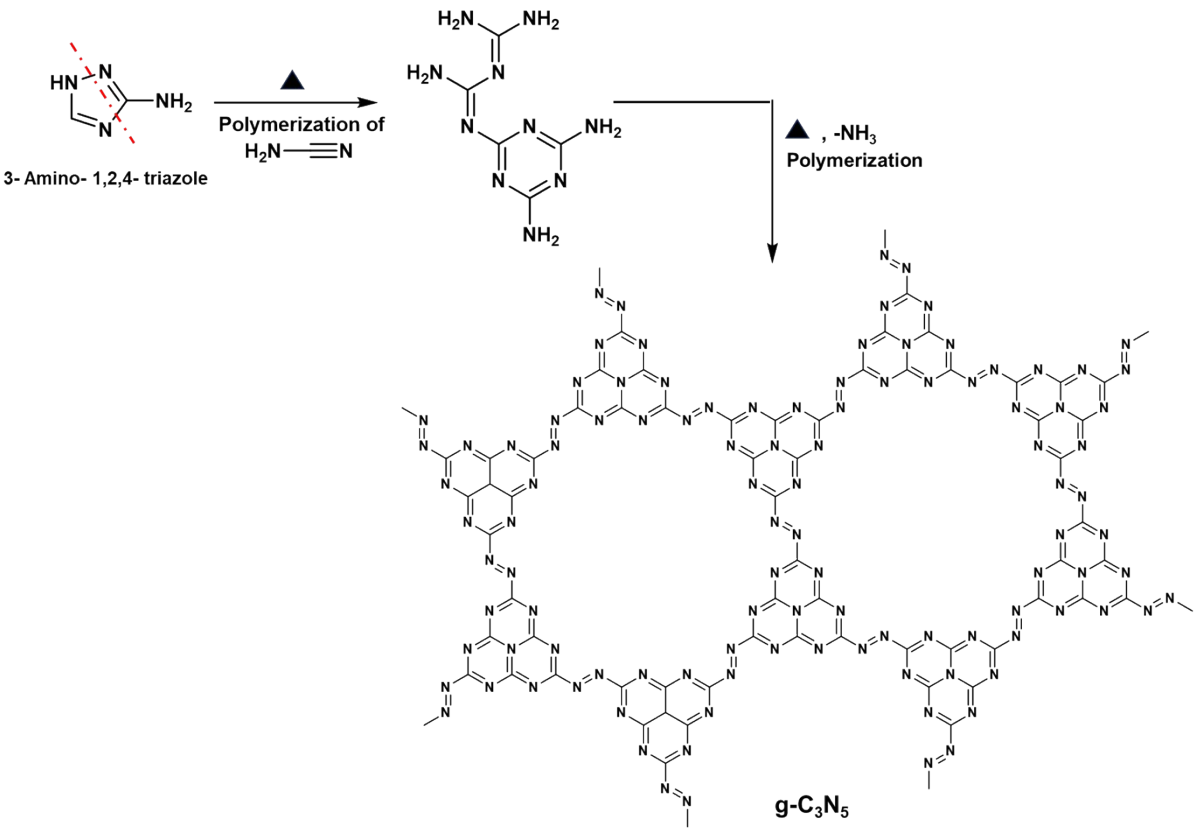

Fig. S1 Synthetic route and structure of synthesized g-C_3N_5.

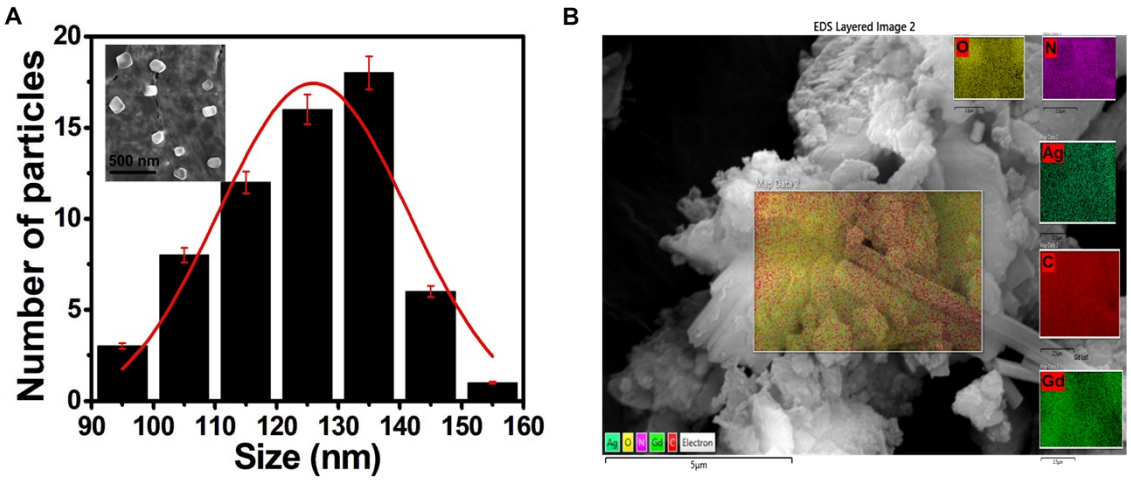

Fig. S2 (A) Size distribution histogram of AgNCs. Inset shows FESEM image of AgNCs. **(B)** Elemental analysis of CNGdAg-40 % showing the presence of C, O, N, Gd, and Ag.

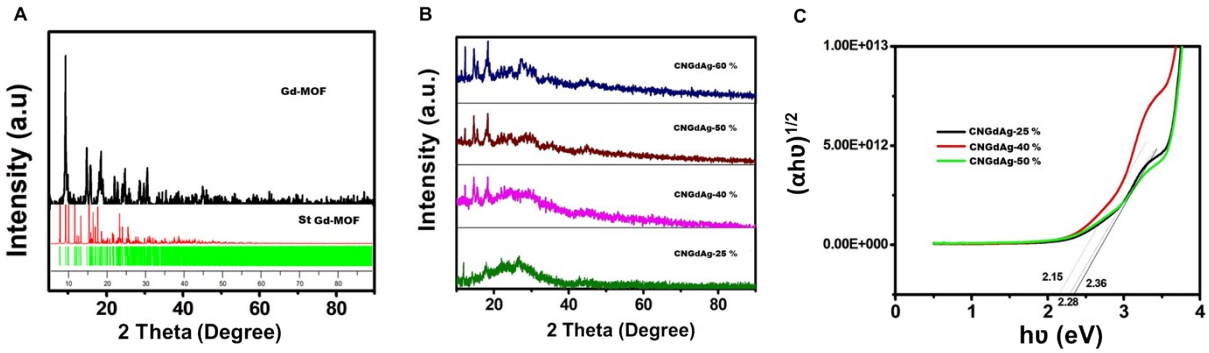

Fig. S3 (A) XRD patterns of stimulated Gd-MOF ($C_{23}H_{32}GdN_7O_{13}$) and as synthesized Gd-MOF. **(B)** XRD patterns of various loading of Gd-MOF with fixed amount of g-C_3N_5. **(C)** Band gap measured from UV-DRS data.

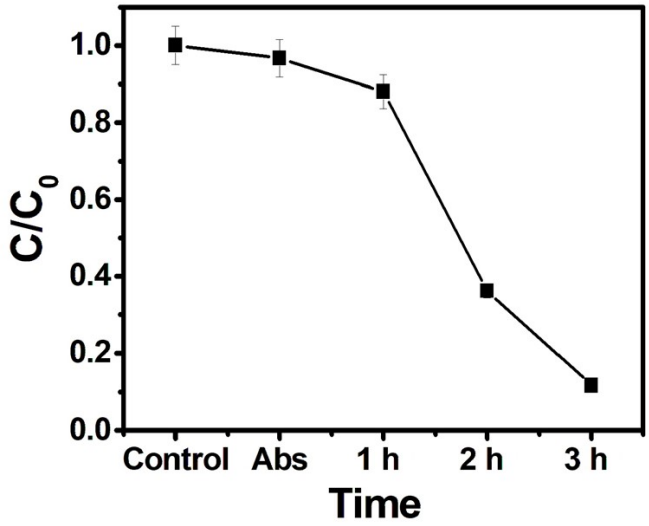

Fig. S4 Degradation rate of Cr^{6+} at 25 ppm concentration using CNGdAg-40 %.

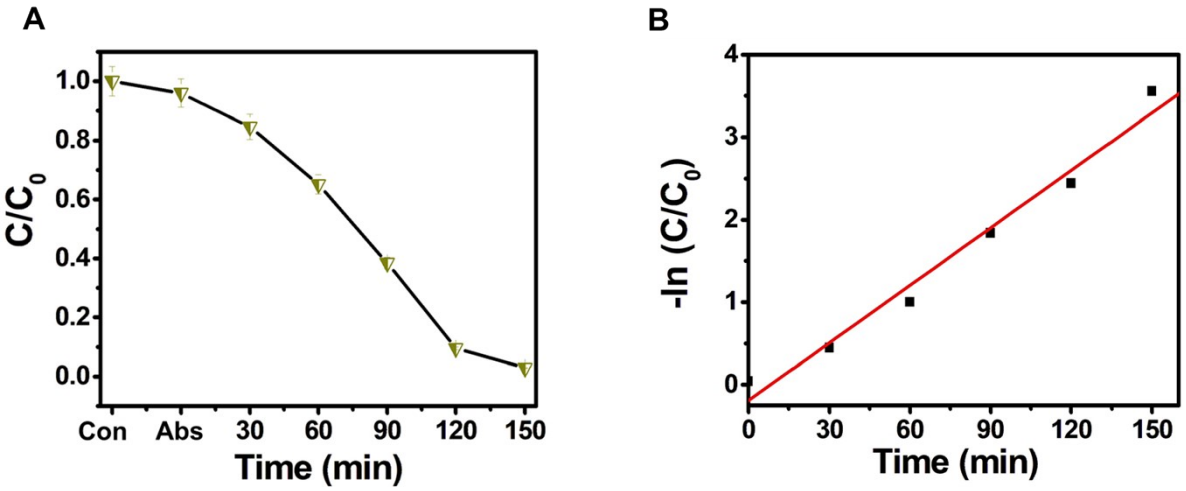

Fig. S5 (A) Degradation and **(B)** kinetics rate of Cr^{6+} in the presence of CNGdAg-40 % with citric acid.

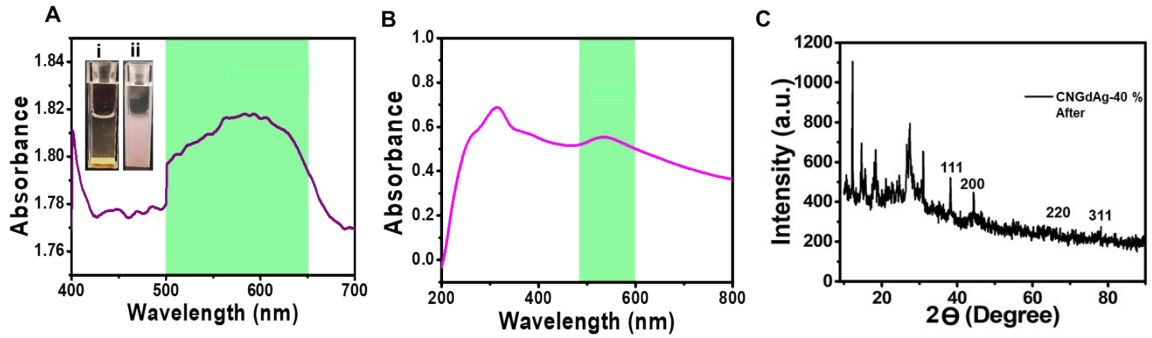

Fig. S6 UV spectra of **(A)** Au nanoparticles dispersion in the presence of CNGdAg-40 % after irradiation. Inset images showing Au precursor with CNGdAg-40 % (i) before and (ii) after photolysis. **(B)** UV-Vis DRS spectrum of CNGdAg-40 % after photolysis. **(C)** XRD pattern of Au nanoparticles.

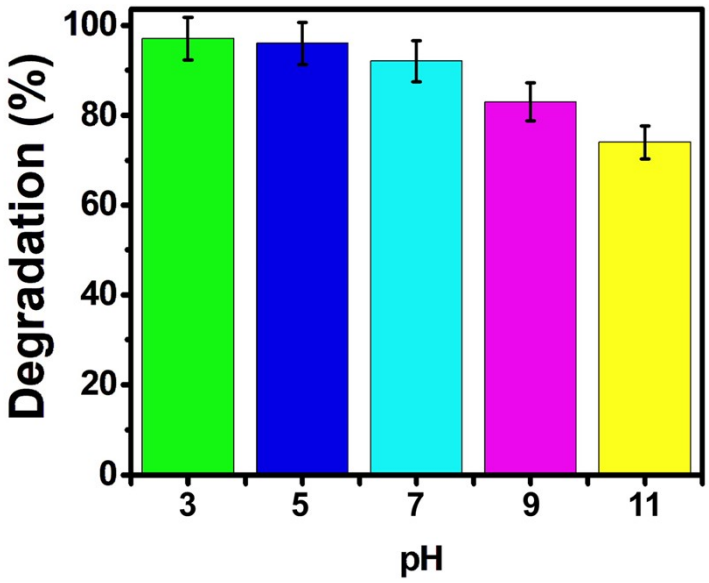

Fig. S7 Photoreduction of Cr^{6+} under various pH conditions.

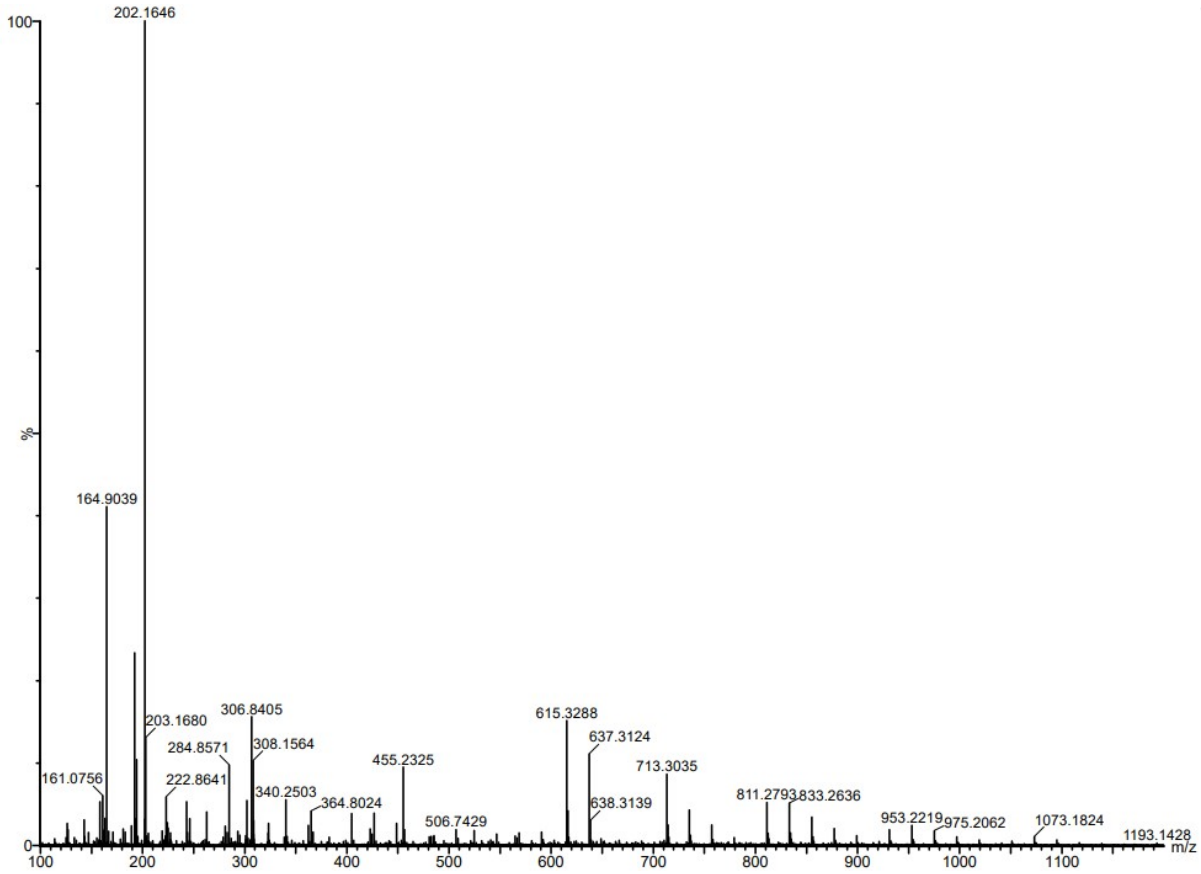

Fig. S8 HRMS spectrum of degraded neomycin solution in 25 minutes irradiation in the presence of CNGdAg-40 %.

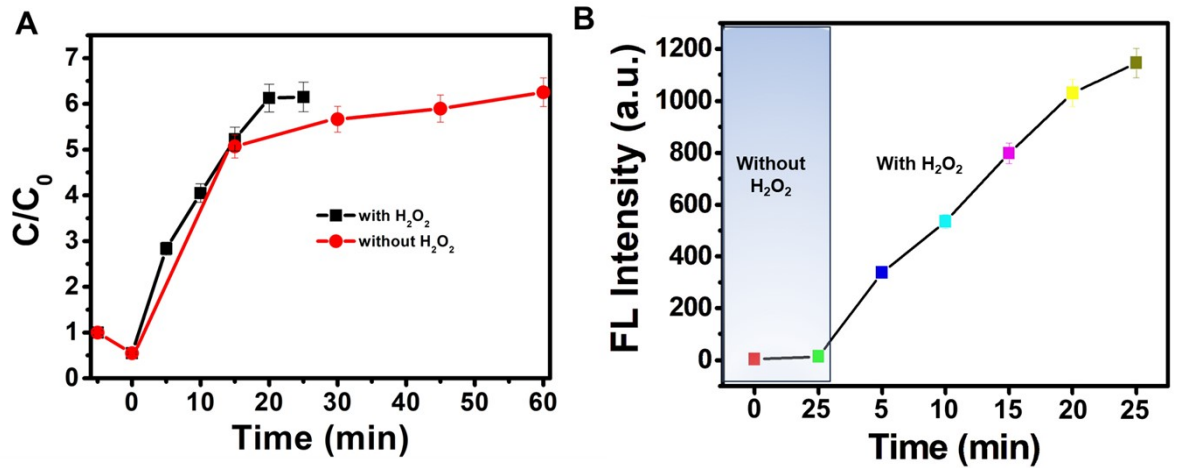

Fig. S9 (A) Degradation rate of neomycin with and without H_2O_2. **(B)** Production of ·OH radicals in the presence of CNGdAg-40 % with and without H_2O_2 under visible light irradiation.

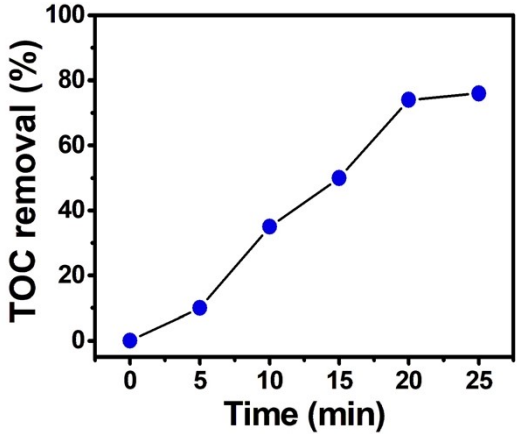

Fig. S10 TOC removal rate of neomycin degradation.

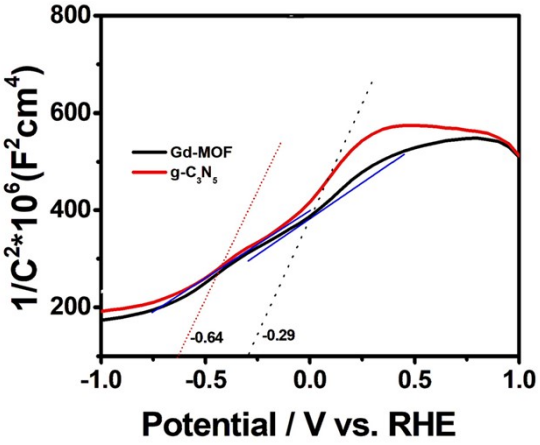

Fig. S11 Mott-Schottky diagram of Gd-MOF, g-C_3N_5.

Fig. S12 Confirmation test for the presence of carboxylic acid functional groups on CNGdAg-40 % surface.