The Simple Hydrothermal Synthesis of Ag-ZnO-SnO_2 Nanochain And Its Multiple Applications

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Figure caption

Fig. S1 Chemical structure of Azo Dyes (i) Acid Black 1 (ii) Acid Violet 7

Fig. S2 Schematic representation of Heber Multi lamp photoreactor

Fig. S3 XRD patterns of Ag-ZnO-SnO_2 at various percentages (a) 3wt%, (b) 6wt%, (c) 9wt% and (d) 15wt%

Fig. S4 HR-SEM images of Ag-ZnO-SnO_2 at different magnifications (a) x 15K, (b) x 20K, (c) x 68.6K and (d) x 80K.

Fig. S5 EDS analysis of 12wt% Ag-ZnO-SnO_2.

Fig. S6 UV−vis diffuse reflectance spectra (A) (a) ZnO, (b) SnO_2, (c) Ag-ZnO and (d) 12wt% Ag-ZnO-SnO_2, (B) Kubelka–Munk function versus Energy (eV) (a) ZnO, (b) SnO_2, (c) Ag-ZnO and (d)Ag-ZnO-SnO_2.

Fig. S7 Photoluminescence spectra of (a) Prepared ZnO and (b) 12wt% Ag-ZnO-SnO_2

Fig. S8 N_2 adsorption–desorption isotherm of (a) Ag-ZnO-SnO_2 and (b) their pore size distribution.

Fig. S9 UV spectra of AB 1 at different irradiation time with 12wt% Ag-ZnO-SnO_2 (a) 0 min, (b) 15min, (c) 30 min and (d) 45 min.

Fig. S10 UV spectra of AV 7 at different irradiation time with 12wt% Ag-ZnO-SnO_2 (a) 0 min, (b) 15min, (c) 30 min and (d) 60 min.

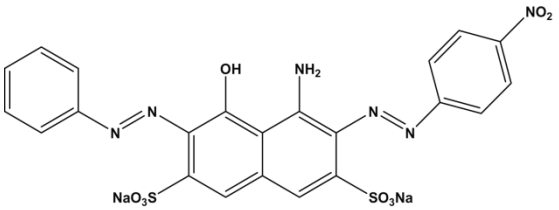
Fig. S11 Effect of solution pH :AB 1: dye concentration = 3×10^{-4} M, catalyst suspended = 3 g L^{-1} , airflow rate = 8.1 mL s^{-1}, $I = 1.381 \times 10^{-6}$ einstein L^{-1} s^{-1} and irradiation time 45 min. AV 7 dye:

dye concentration = 5×10^{-4} M, catalyst suspended = 3 g L^{-1}, airflow rate = 8.1 mL s^{-1}, I = 1.381 $\times 10^{-6}$ einstein L^{-1} s^{-1} and irradiation time= 45 min.

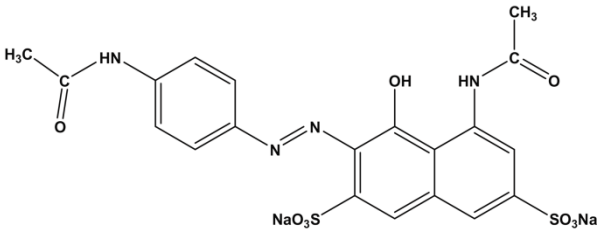
Fig. S12 Effect of catalyst loading: AB 1: dye concentration = 3×10^{-4} M, pH = 11, airflow rate = 8.1 mL s^{-1}, I = 1.381 $\times 10^{-6}$ einstein L^{-1} s^{-1} and irradiation time 45 min. AV 7 dye: dye concentration = 5×10^{-4} M, pH = 11, airflow rate = 8.1 mL s^{-1}, I = 1.381 $\times 10^{-6}$ einstein L^{-1} s^{-1} and irradiation time = 45 min

Fig. S13 Reusability of Ag-ZnO-SnO_2 (a) AB 1(blue) (b): AV 7(pink) :AB 1: dye concentration = 3×10^{-4} M; pH = 11; catalyst suspended = 3 g L^{-1}airflow rate = 8.1 mL s^{-1}, I = 1.381 $\times 10^{-6}$ einstein L^{-1} s^{-1} and irradiation time 45 min. AV 7 dye: dye concentration = 5×10^{-4} M; pH = 11, catalyst suspended = 3 g L^{-1}, airflow rate = 8.1 mL s^{-1}, I = 1.381 $\times 10^{-6}$ einstein L^{-1} s^{-1} and irradiation time = 60 min.

Fig. S14 XRD patterns of (a) fresh Ag-ZnO-SnO_2 and (b) Ag-ZnO-SnO_2 after 4th run.



Acid Black 1



Acid Violet 7

Fig. S1

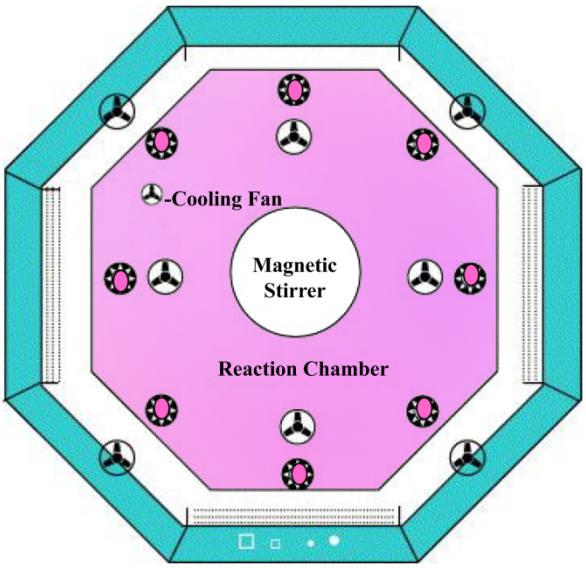


Fig. S2

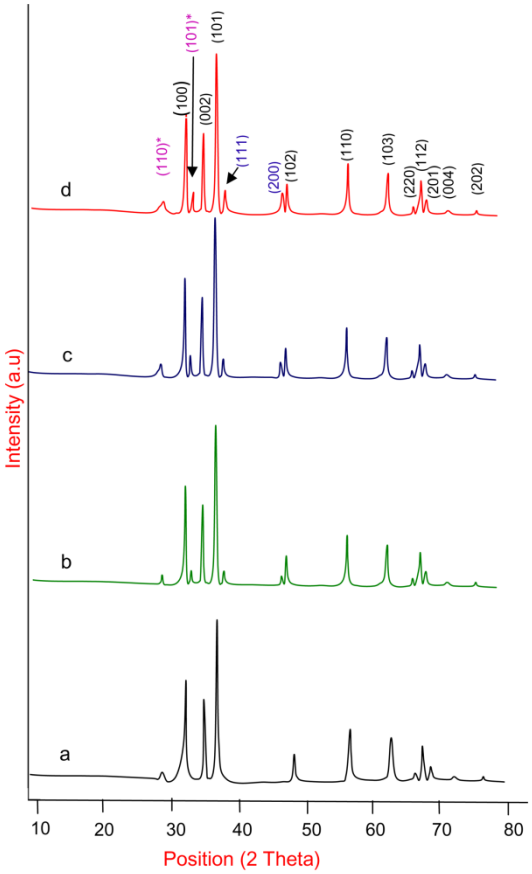


Fig. S3

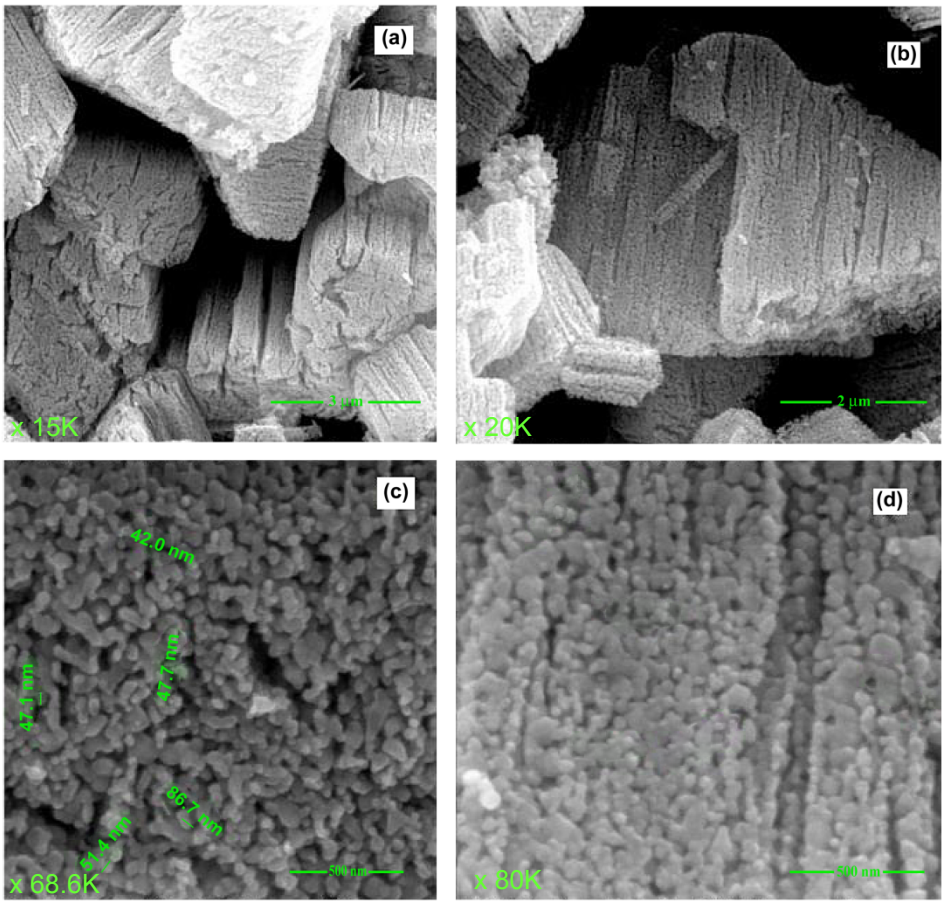


Fig. S4

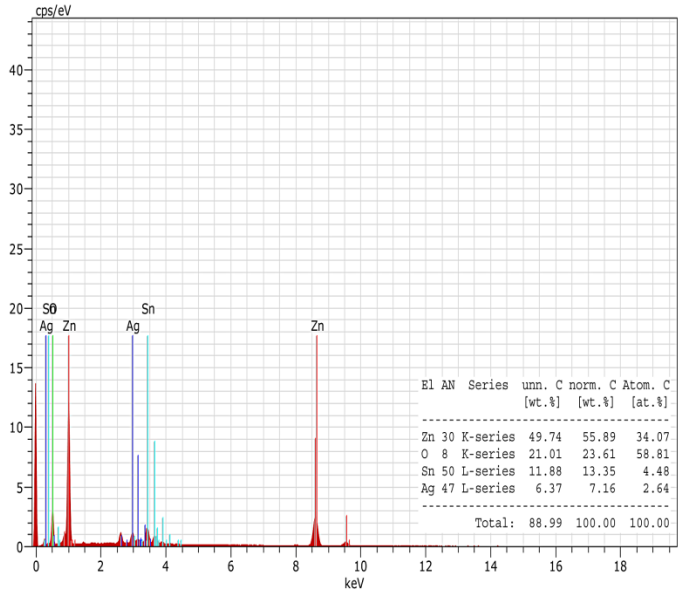


Fig. S5

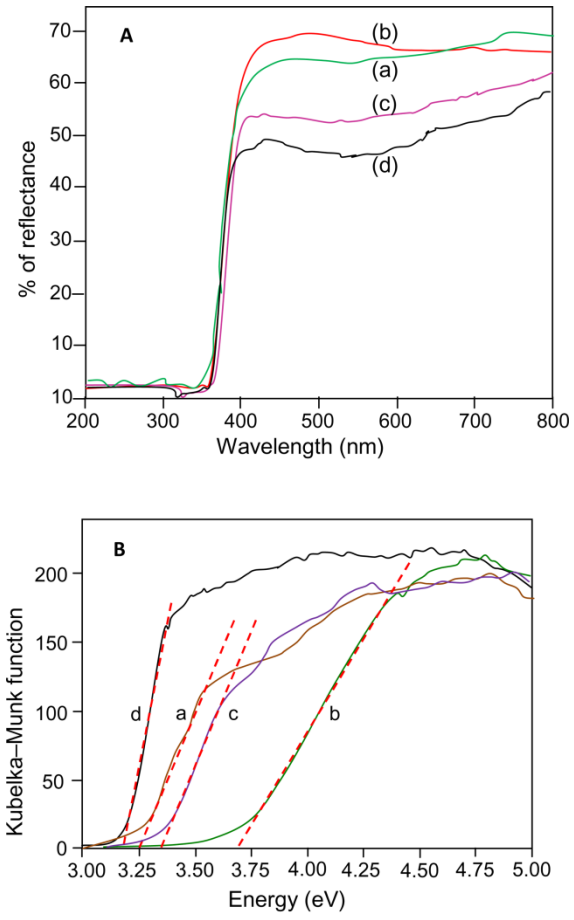


Fig. S6

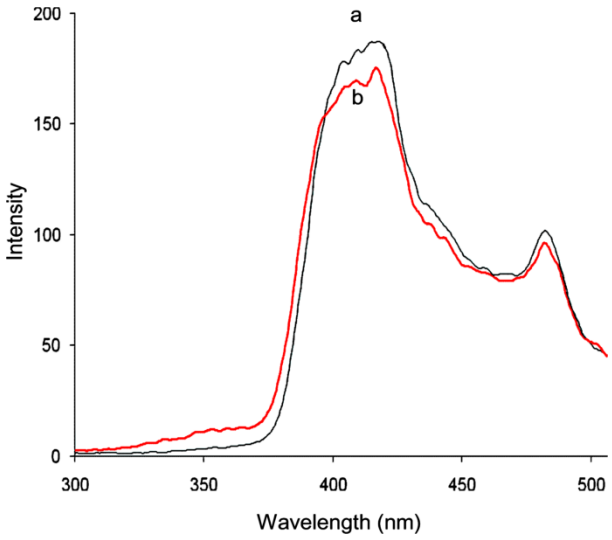
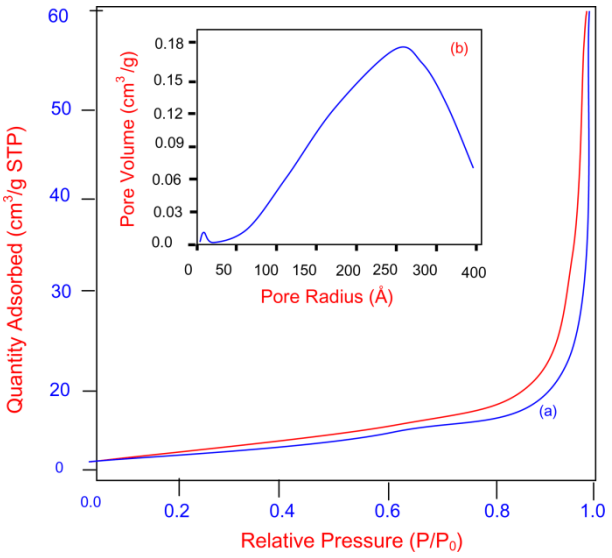


Fig. S7



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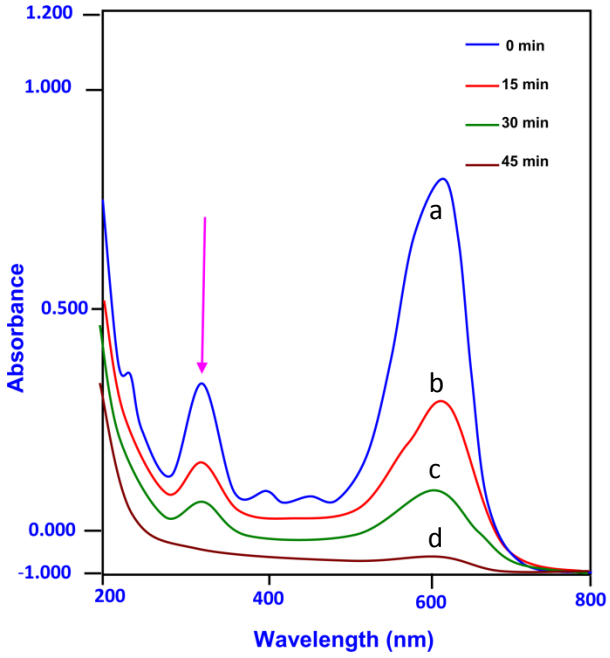

Fig. S9

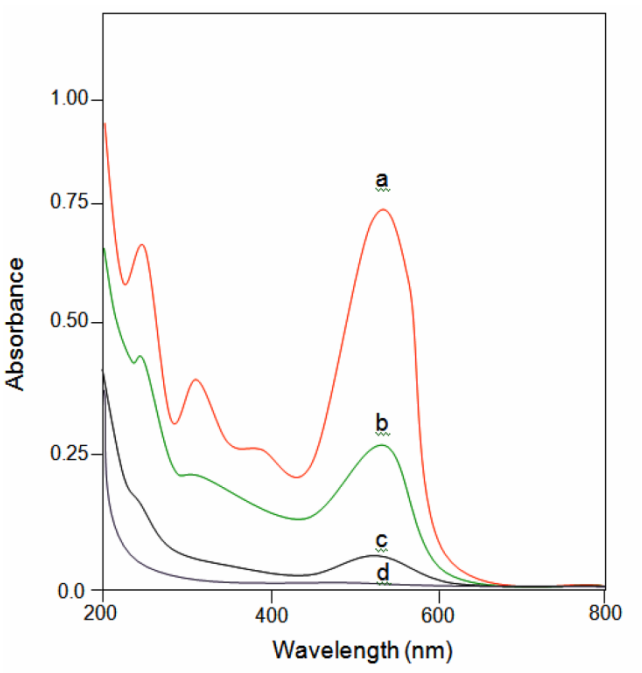

Fig. S10

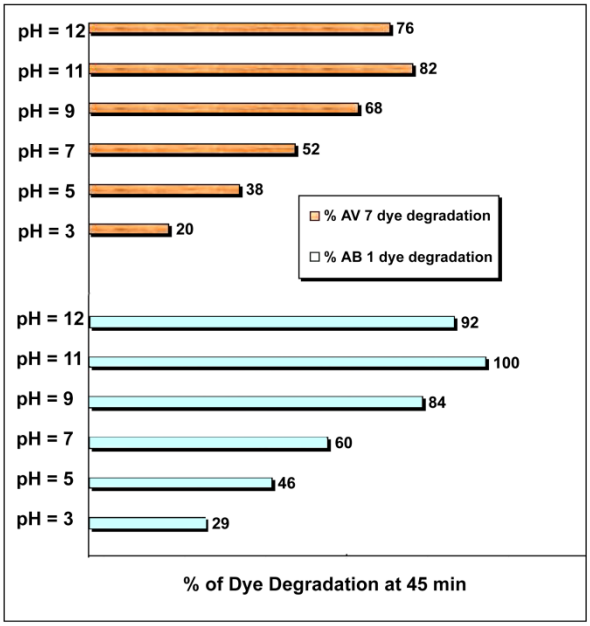

Fig. S11

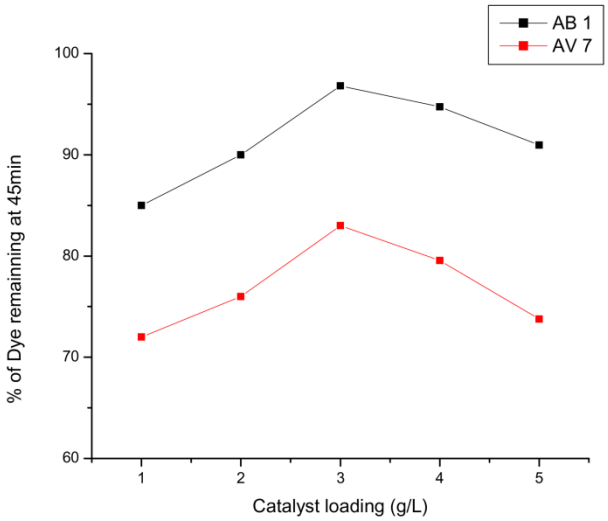

Fig. S12

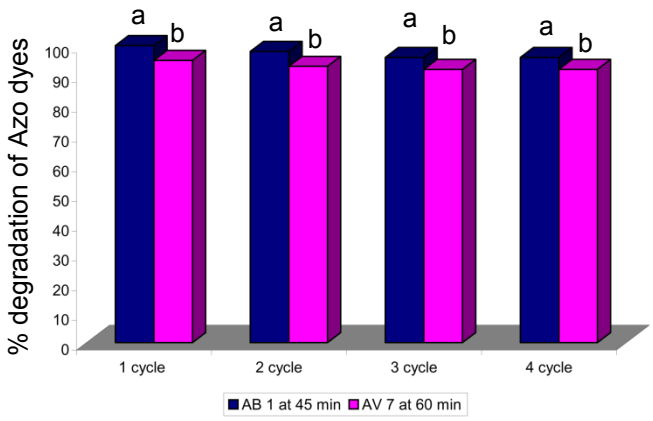

Fig. S13

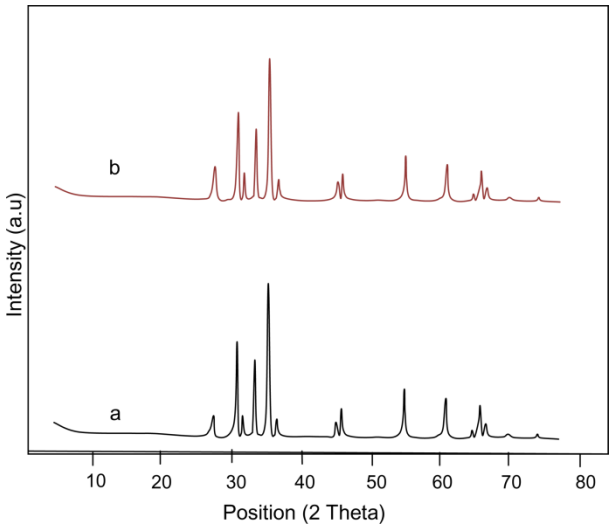

Fig. S14