Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

ELECTRONIC SUPPLEMENTARY INFORMATION

Tuning the Catalytic Performance of $CaSnO_3$ by Developing S-Scheme P-N Heterojunction through $Ag_6Si_2O_7$ Doping

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Sr#	SAMPLE	FWMH	AVERAGE CRYSTALLINE SIZE D (nm)
1	$CaSnO_3$	0.1606	53.63596426
2	$Ag_6Si_2O_7$	0.5375	22.40214328
3	AgCS-F	0.2010	44.67589422
4	AgCS-G	0.2106	43.42165199
5	AgCS-H	0.4241	41.14970216
6	AgCS-I	0.5274	40.87710789
7	AgCS-J	0.5488	38.04289865

Table S1. The average crystal size "D" and FWMH

Table S2 BET-specific surface areas of the photocatalysts.

Serial Number	**Samples**	**BET Surface Area (m^2/g)**
1	$CaSnO_3$	2.2642
2	$Ag_6Si_2O_7$	2.5541
3	AgCS-F	5.3318
4	AgCS-G	7.1742
5	AgCS-H	5.4962
6	AgCS-I	6.2450
7	AgCS-J	8.7899

Table S3. The bandgap of the $CaSnO_3$ and $Ag_6Si_2O_7$ and their composites

Serial Number	Samples	Bandgap (eV)
1	$CaSnO_3$	3.73
2	$Ag_6Si_2O_7$	2.31
3	AgCS-F	3.37
4	AgCS-G	3.36
5	AgCS-H	3.27
6	AgCS-I	3.22
7	AgCS-J	3.20

Table S4. The rate constants for the photocatalytic degradation of Rhodamine B for $Ag_6Si_2O_7$, $CaSnO_3$ and their composites under visible light irradiation.

SAMPLE	K (min^{-1})
$CaSnO_3$	0.00203
$Ag_6Si_2O_7$	0.02044
AgCS-F	0.02452
AgCS-G	0.02167
AgCS-H	0.04971
AgCS-I	0.03737
AgCS-J	0.04155

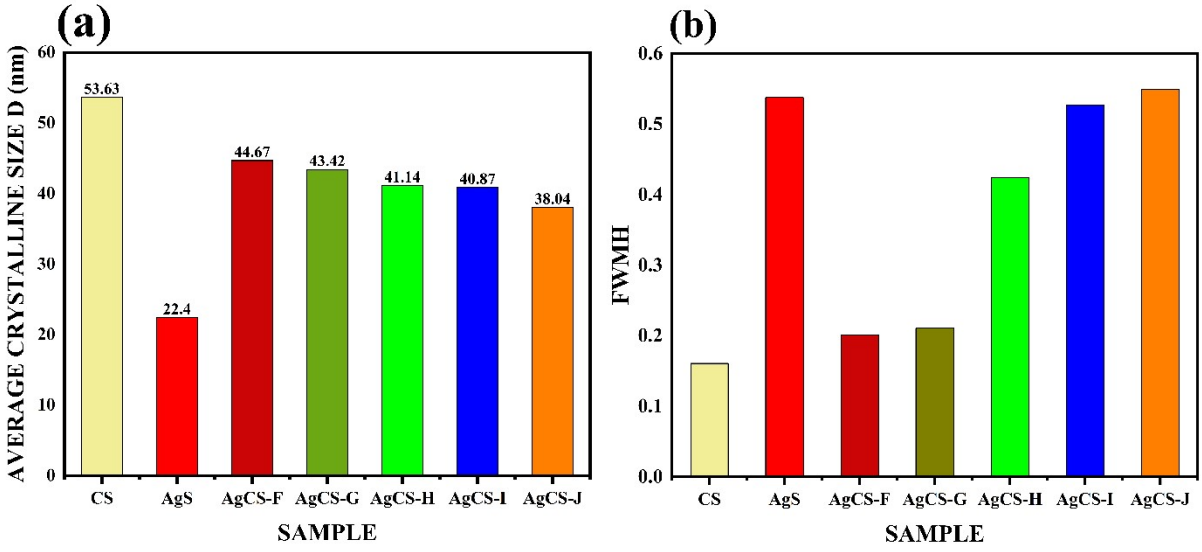

FIGURE S1 (a-b) The plots of average crystal size "D" and FWHM

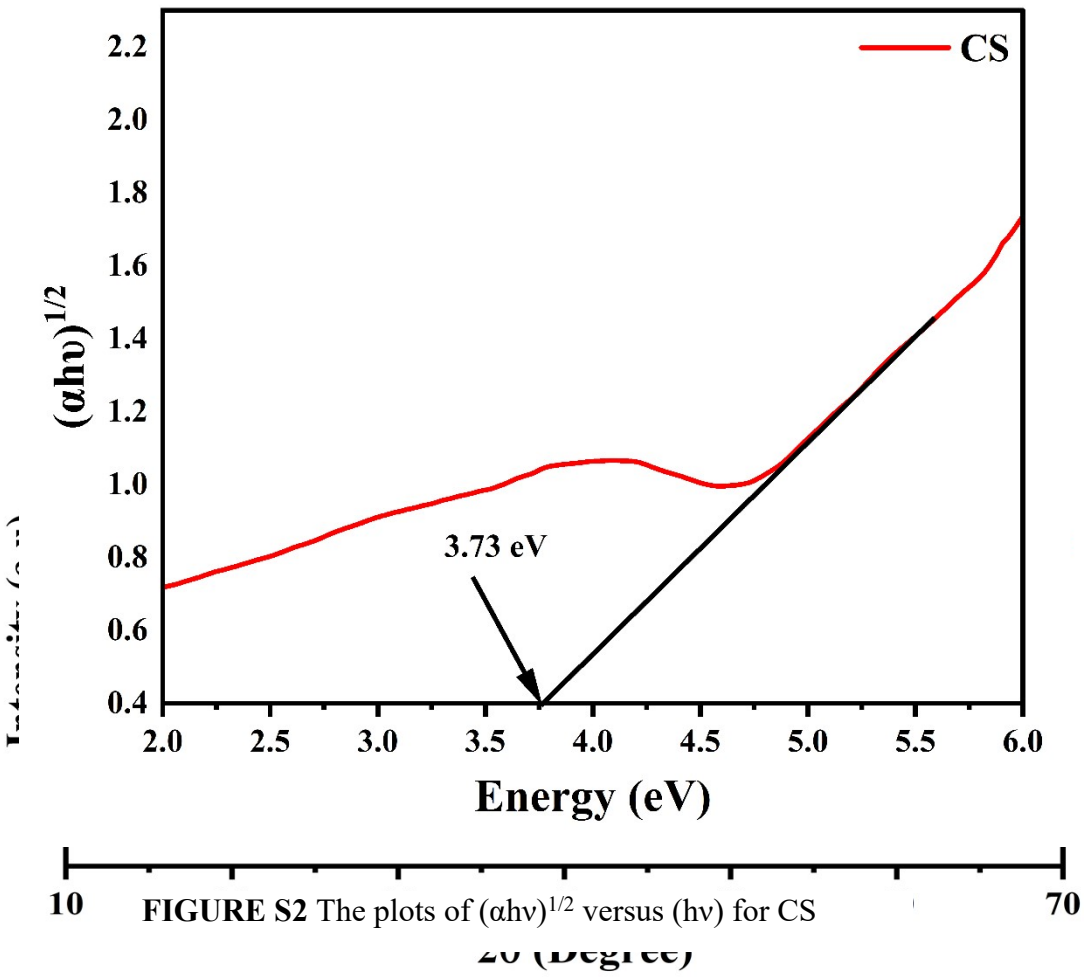

FIGURE S2 The plots of $(\alpha h\nu)^{1/2}$ versus $(h\nu)$ for CS

FIGURE S3 The XRD spectra elucidate the stability and reusability of AgCS-H sample

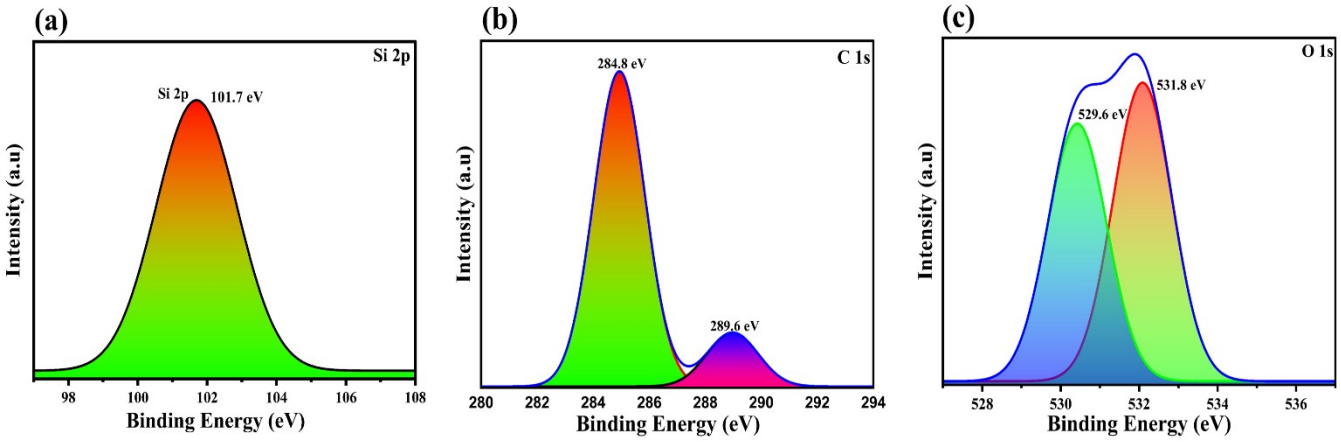

FIGURE S4 (a,b,c) The XPS Deconvolution high resolution spectra of Si, C and O.

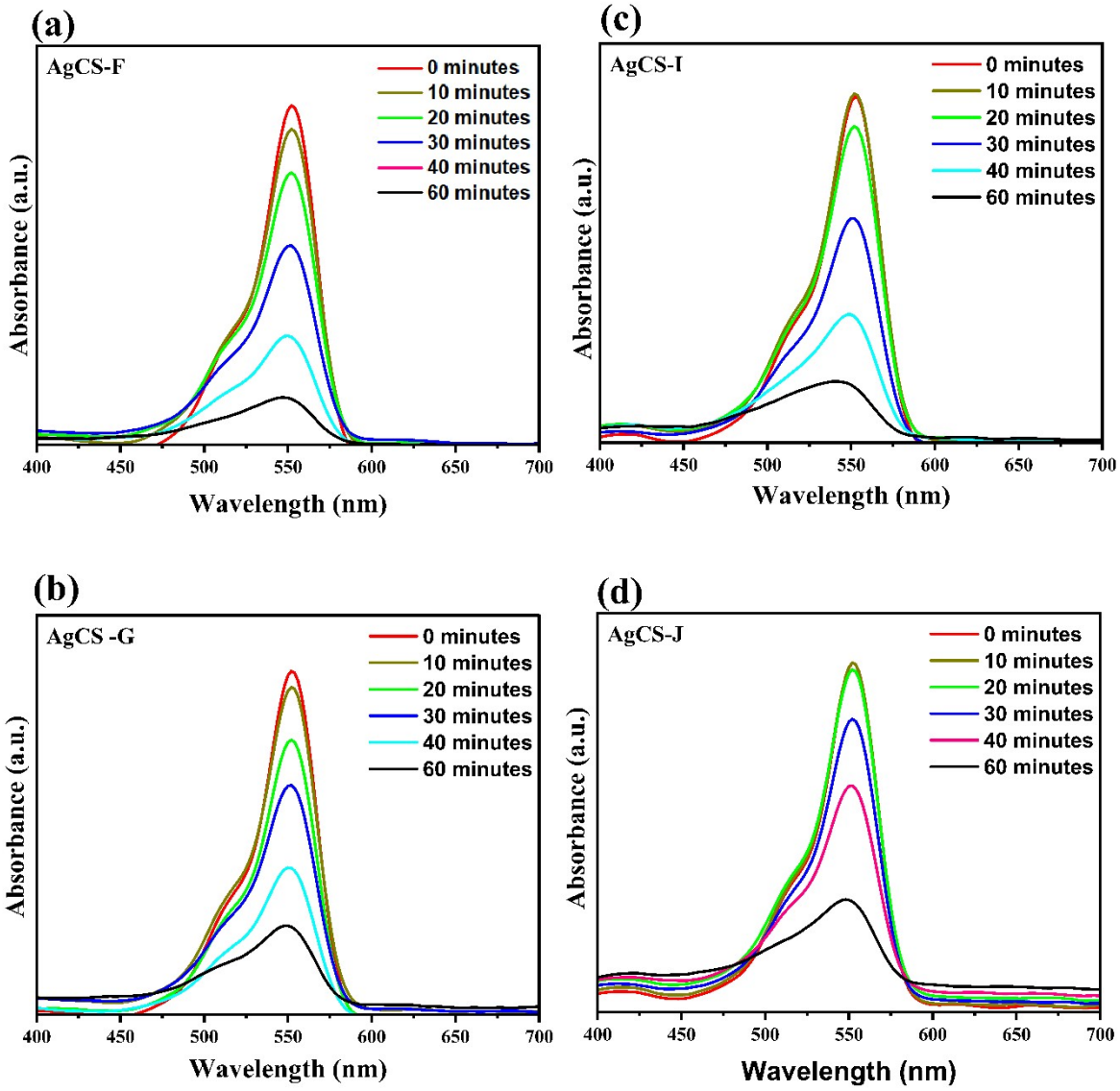

FIGURE S5 (a-d) Plots of degradation of Rhodamine B graphs for AgS, CS and their composites

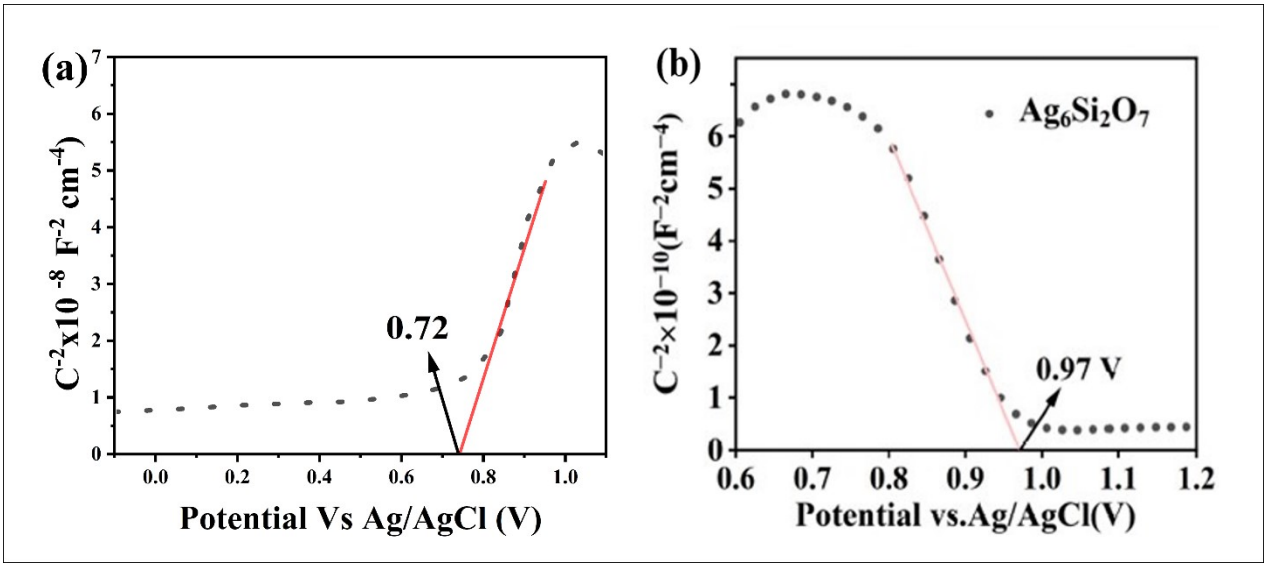

FIGURE S6 (a-b) MS plots of samples (a) $CaSnO_3$ and (b) $Ag_6Si_2O_7$

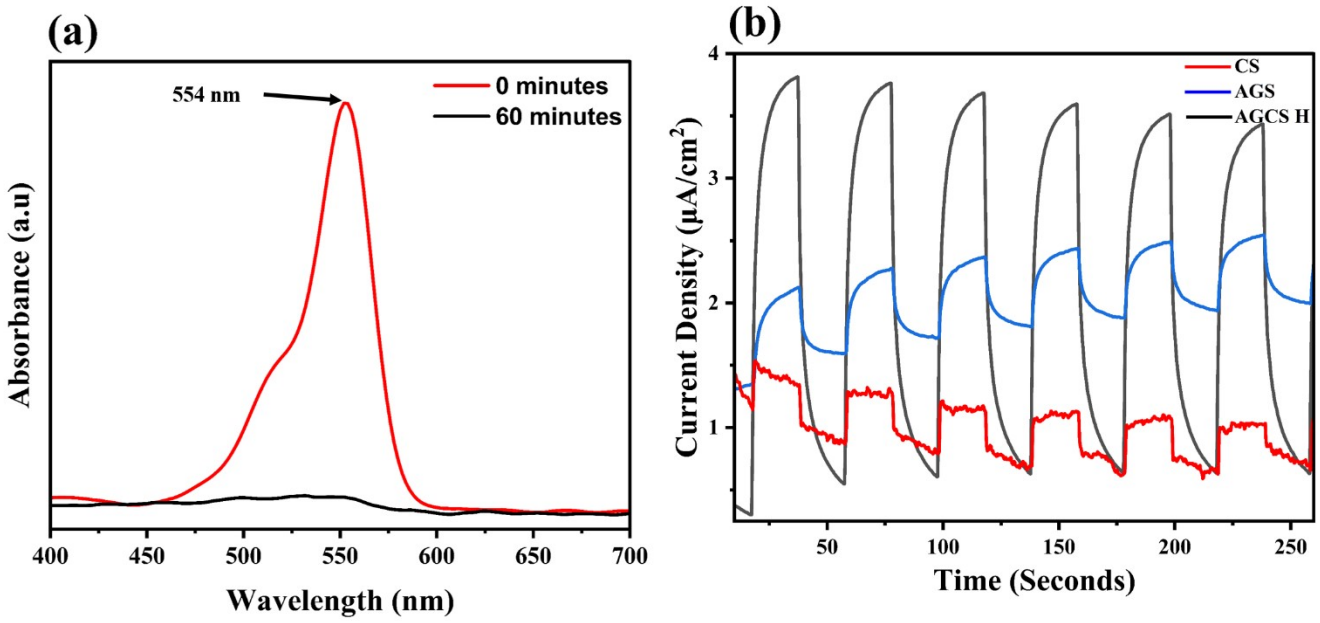

FIGURE S7 (a) Plot of an eminent peak of absorption at 554 nm for RhB dye (b) the current density plot of CS, AgS and AgCS-H

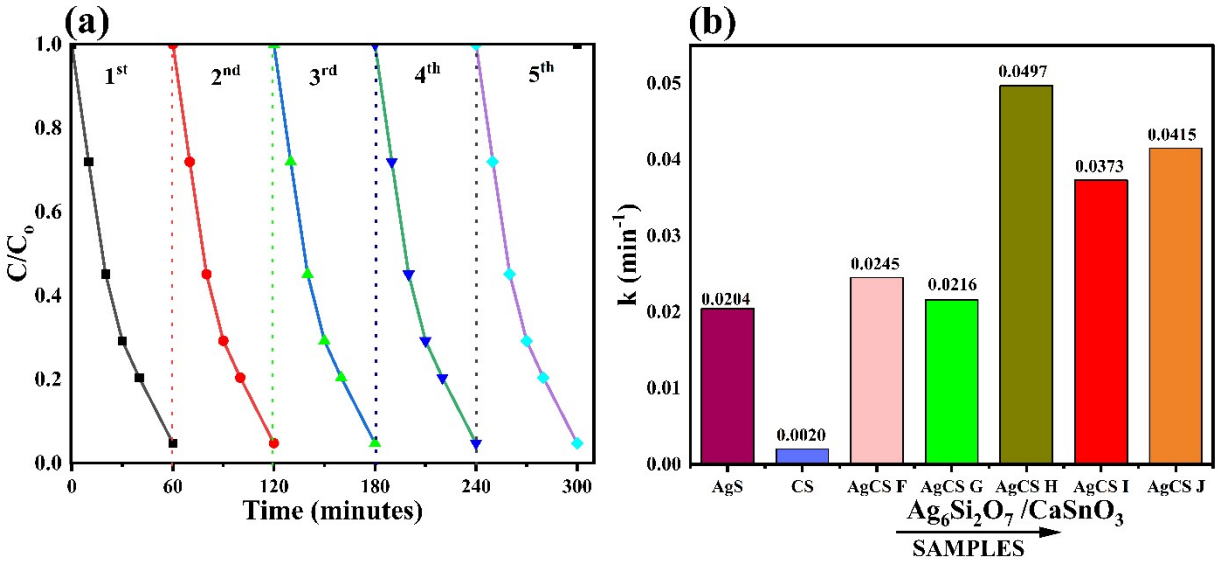

Figure S8 (a) Cycling experiments and (b) rate constants for AgS, CS and their composites under visible light irradiation. ESR analysis of AgCS-H sample

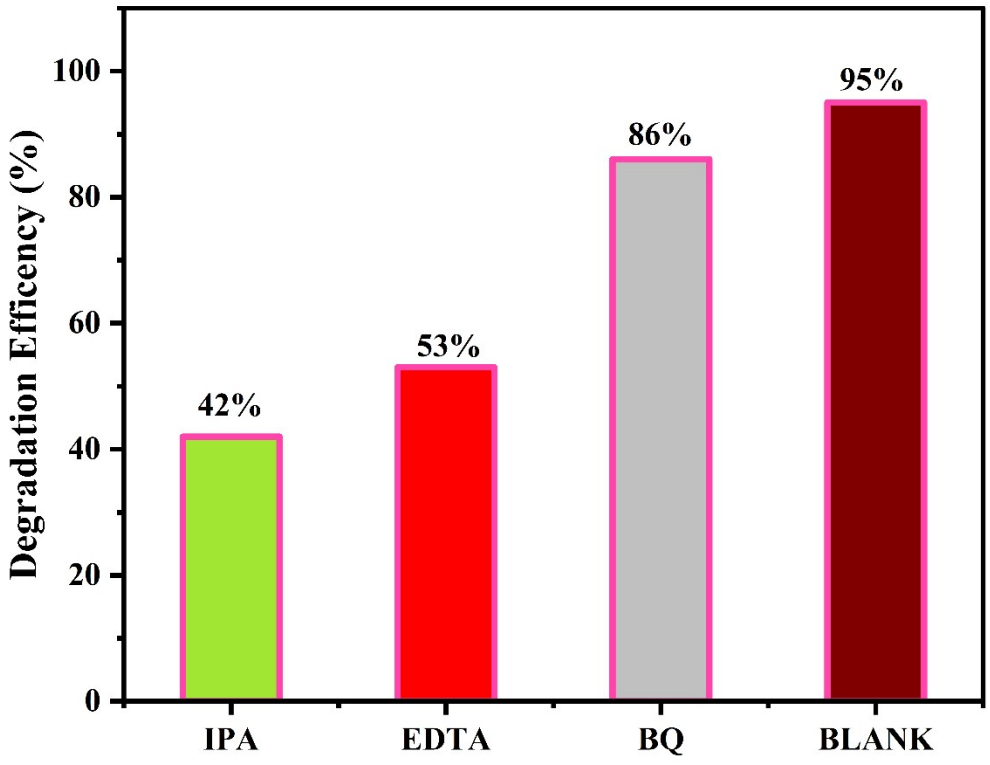

Figure S9. Photocatalytic activities of AGCS-H photocatalyst by different scavengers under UV–visible light irradiation.