Supplementary data

Incorporation of a Z-scheme AgI/$Ag_6Si_2O_7$ heterojunction to PET fabric for efficient and repeatable photocatalytic dye degradation

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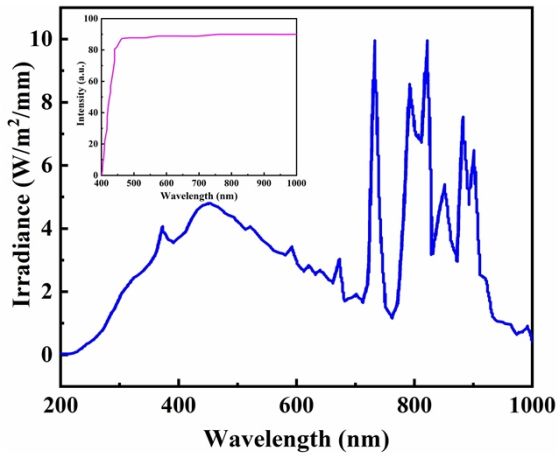

Figure S1 Xe spectrum produced by Xenon lamp and transmittance of the cut-off film (Inserted).

Figure S2 SEM image of PET.

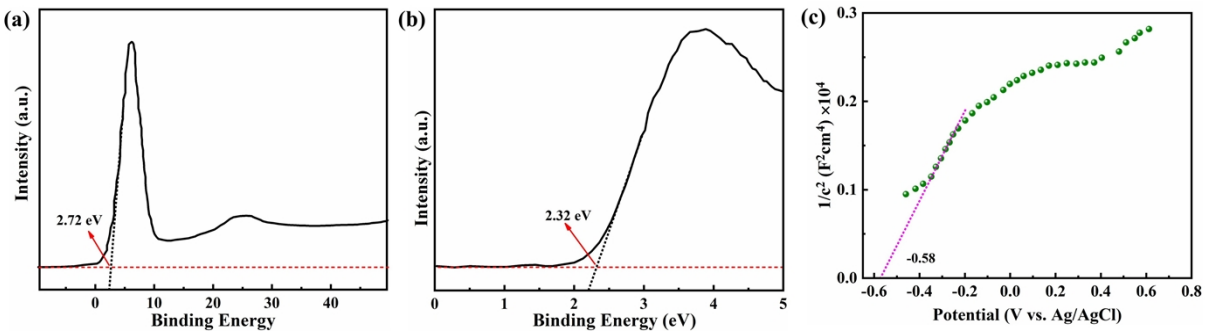

Figure S3 Valence band XPS spectra of $Ag_6Si_2O_7$/PET (a) and AgI/PET (b), Mott-Schottky plots of AgI/PET (c).

Figure S3 showed that the VB of $Ag_6Si_2O_7$ was 2.72 V vs NHE and its CB can be calculated to be 1.44 V vs NHE (Figure S3a). The band gap structure of AgI was first

determined through XPS spectra of valence band (Figure S3b) and Mott-Schottky plots (Figure S3c). Positive slopes for Mott-Schotty plots indicated that AgI verified n-type semiconductor characteristics. Through the extrapolation of the x intercept in the Mott-Schotty curves, the flat-band potential of AgI could be evaluated to be -0.38 V (vs NHE). The valence XPS spectra could be used to check the energy gap from Fermi level (E_f) to the valence band top of semiconductors. The valence band top positions of AgI was 2.32 eV below the E_f. And the E_f was close to flatband potential for n-type semiconductor. Combined with the Eg value, the VB and CB of AgI was 1.94 eV and -0.76 eV, respectively."

Figure S4 Photodegradation of MO, RhB and PhOH of AgI/$Ag_6Si_2O_7$/PET(5) under visible-light irradiation.

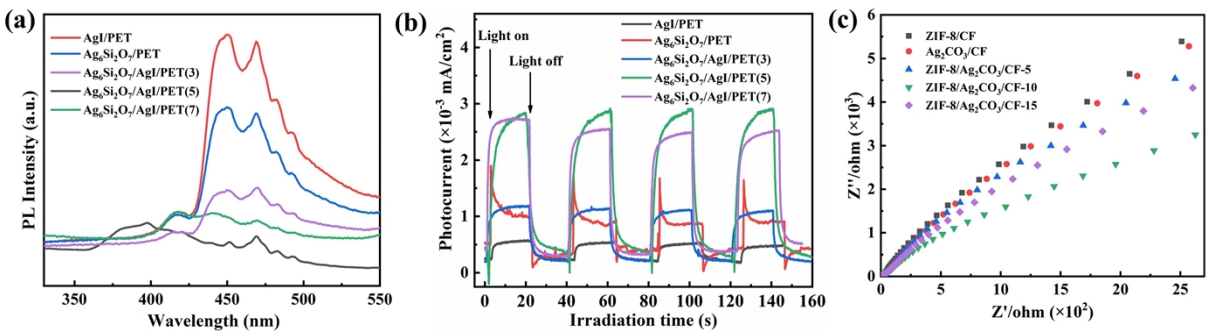

Figure S5 The PL spectra (a), transient photocurrent response (b) and EIS plots (c) of the as-prepared samples.

Figure S6 Nitrogen adsorption-desorption isotherm of $Ag_6Si_2O_7$/PET, AgI/PET and AgI/$Ag_6Si_2O_7$/PET(5).

Table S1 BET surface ares and pore size of $Ag_6Si_2O_7$/PET, AgI/PET and AgI/$Ag_6Si_2O_7$/PET(5)

Samples	S_{BET} (m^2/g)	Pore Volume (cm^3/g)	Pore size (nm)
$Ag_6Si_2O_7$/PET	1.754	0.004	3.432
AgI/PET	28.347	0.115	1.466
AgI/$Ag_6Si_2O_7$/PET(5)	5.746	0.022	1.849

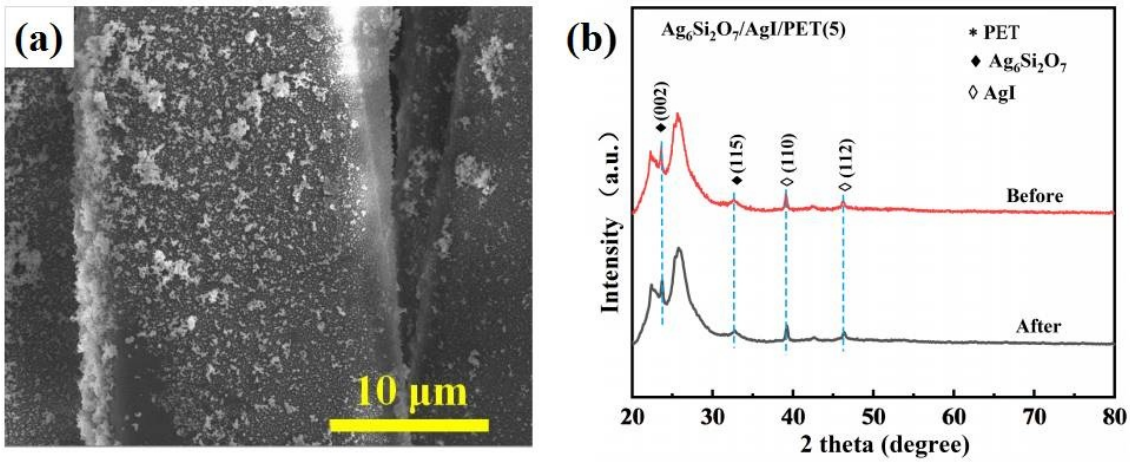

Figure S7 SEM image (a) and XRD patterns (b) of AgI/$Ag_6Si_2O_7$/PET(5) after 5 cycles' photocatalysis.

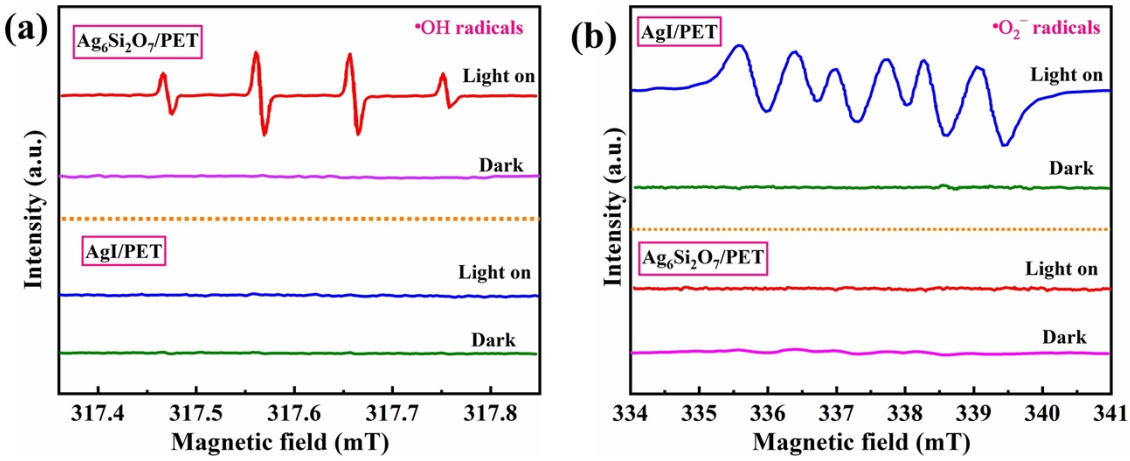

Figure S8 The ESR signals of ·OH (a) and $\cdot O_2^-$ (b) of AgI/$Ag_6Si_2O_7$/PET and AgI/PET.