Electronic Supplementary Information

Supramolecular squares of Sn(IV)porphyrins with Re(I)–corners for the fabrication of self-assembled nanostructures performing photocatalytic degradation of Eriochrome Black T dye

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Fig. S1 ^{1}H-NMR spectrum of *trans*-[5,15-bis(4-pyridyl)-10,20-bis(4-*tert*-butylphenyl)porphyrin] **H₂P²** in CDCl₃.

Fig. S2 ^{1}H-NMR spectrum of *trans*-[5,15-bis(4-pyridyl)-10,20-bis(4-*tert*-butylphenyl)porphyrinato]tin(IV) **SnP^2** in CDCl$_3$.

Fig. S3 ^{1}H-NMR spectrum of **1** in CDCl$_3$.

Fig. S4 ^{1}H-NMR spectrum of **2** in CDCl$_3$.

Fig. S5 Electrospray ionization mass (ESI-MS) spectrum of **SnP^2**.
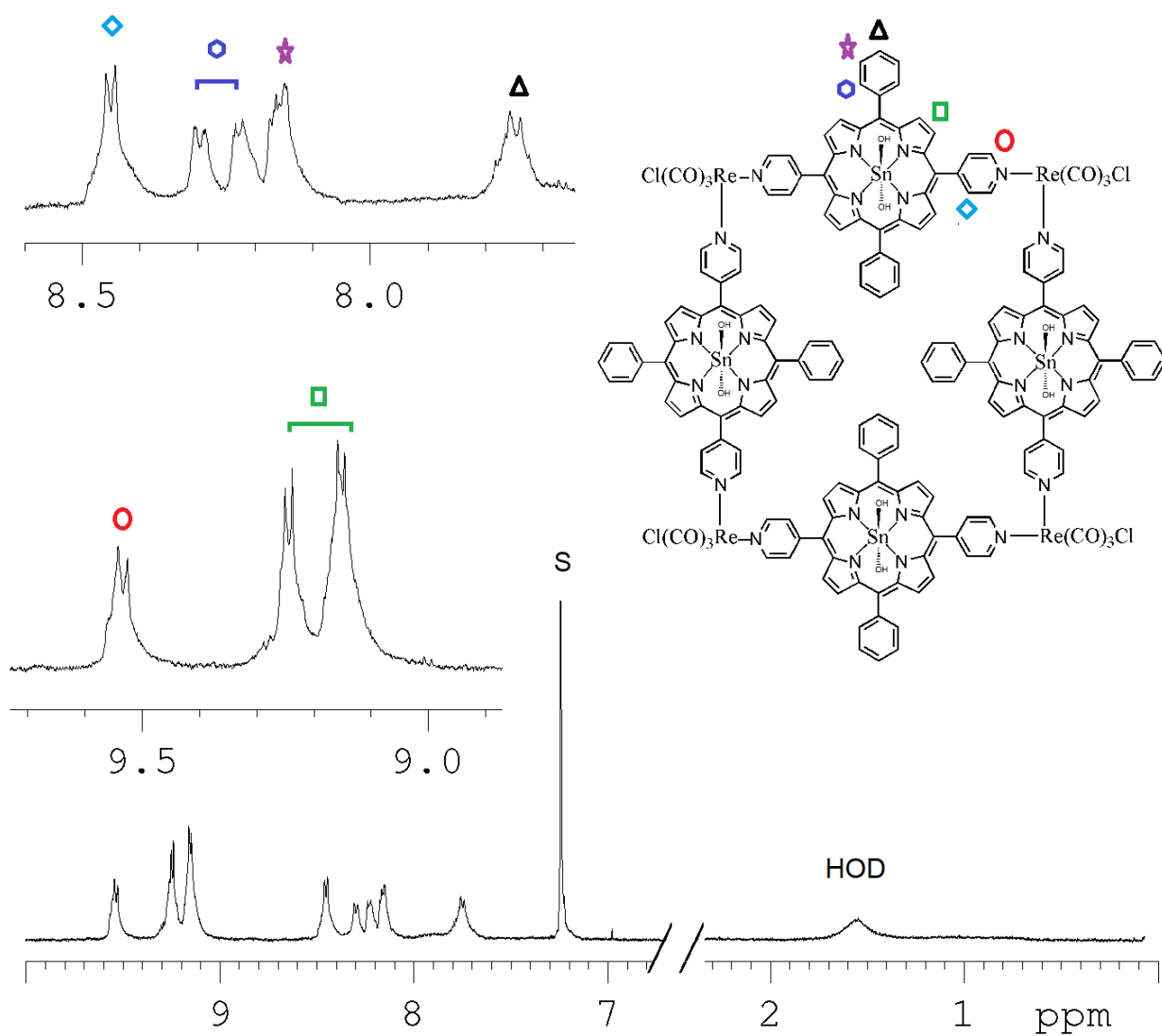
Fig. S6 ESI-MS spectrum of **1**.

Fig. S7 ESI-MS spectrum of **2**.
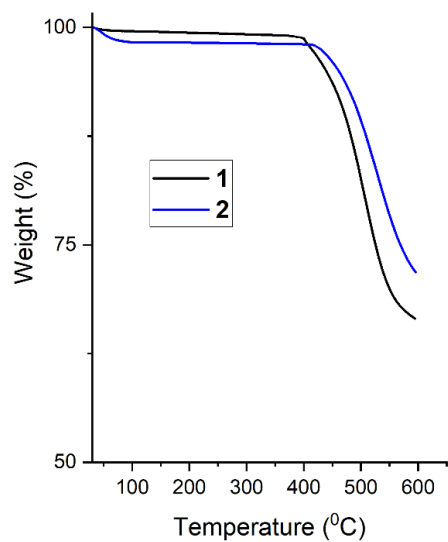
Fig. S8 Thermogravimetric analysis (TGA) curves of **1** and **2**.
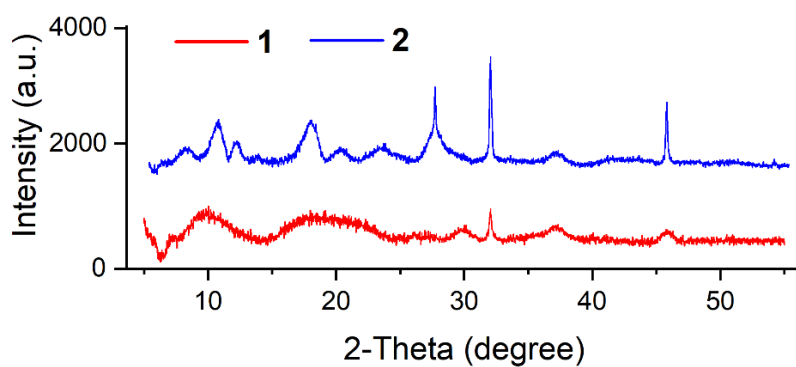
Fig. S9 Powder X-ray diffraction (PXRD) patterns of **1** and **2**.

Fig. S10 Particle size determination by dynamic light scattering (DLS) for **1** and **2** in toluene.
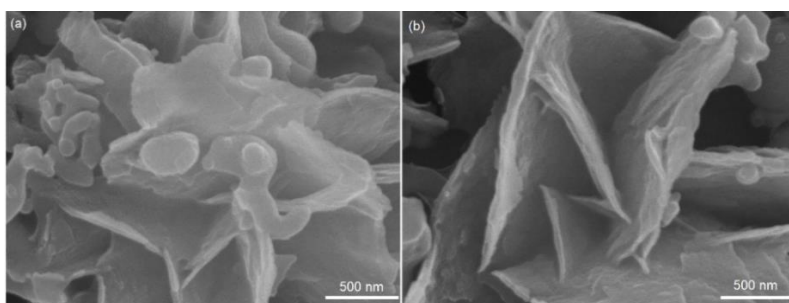
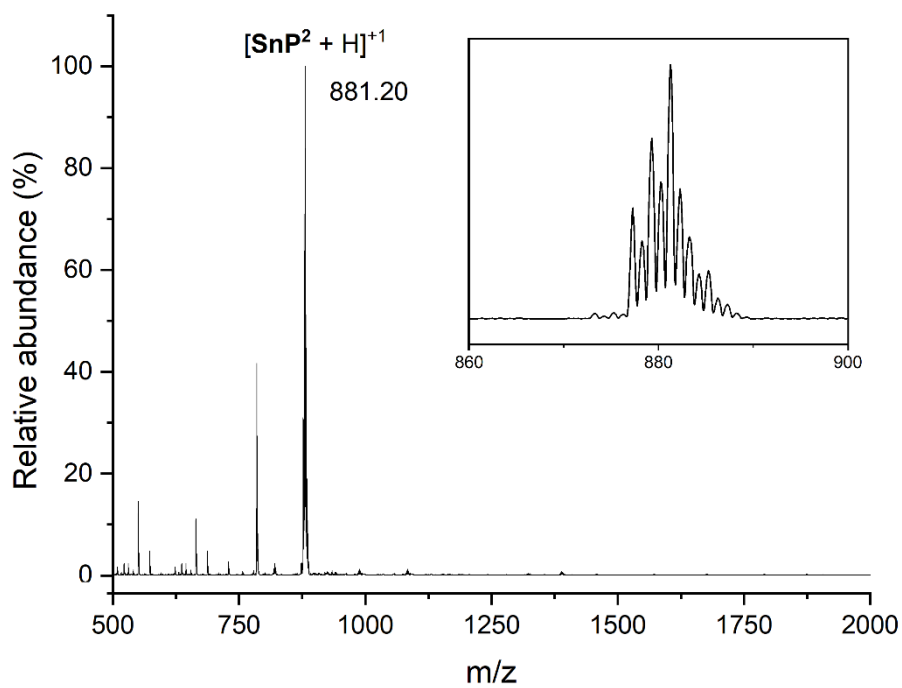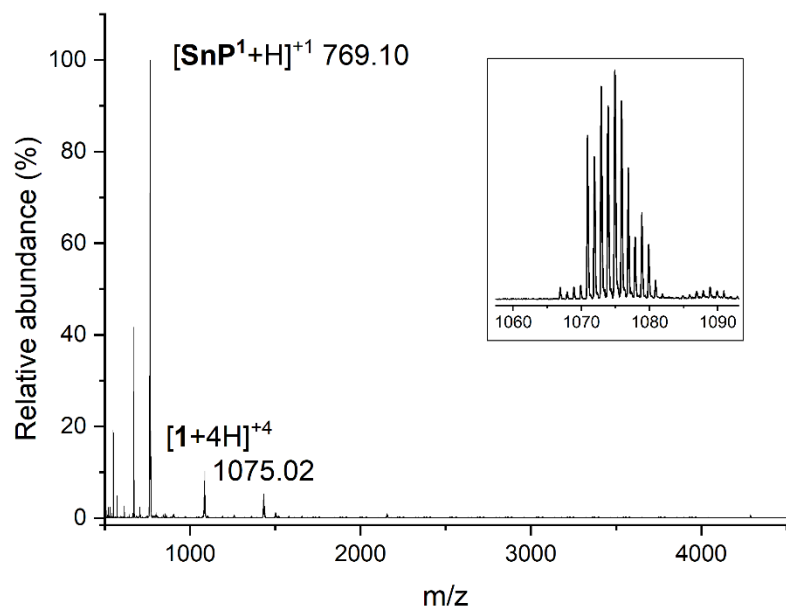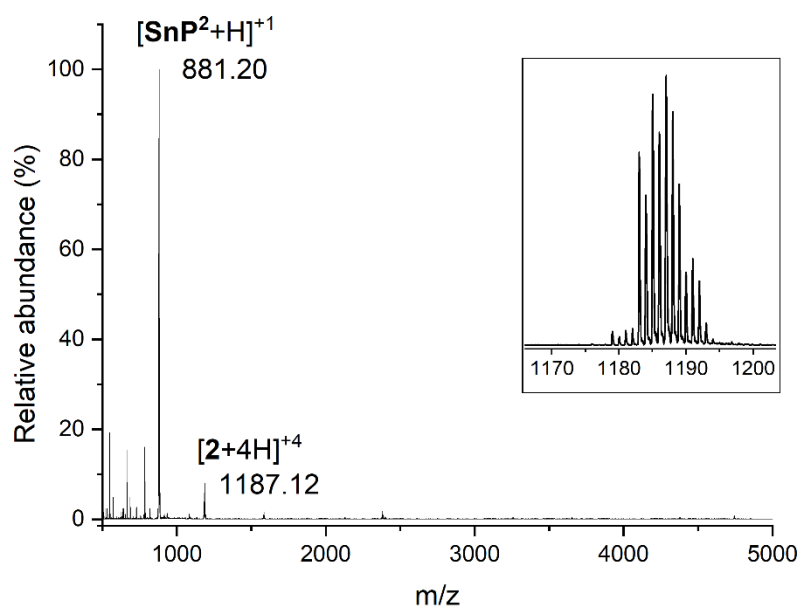**Fig. S11** Field emission scanning electron microscopy (FE-SEM) images for **SnP^1** (a) and **SnP^2** (b).
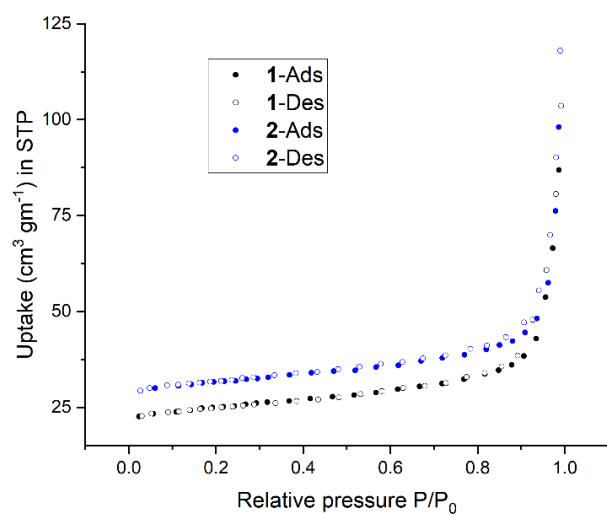
Fig. S12 Adsorption and desorption isotherms of N$_2$ for **1** and **2** at 77 K.
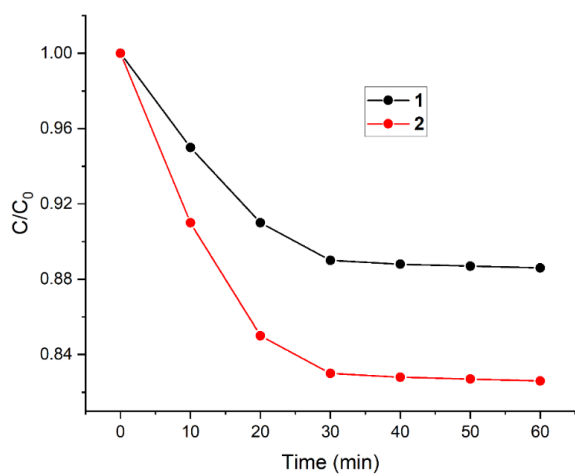
Fig. S13 Adsorption of Eriochrome Black T (EBT) dye on **1** and **2**.
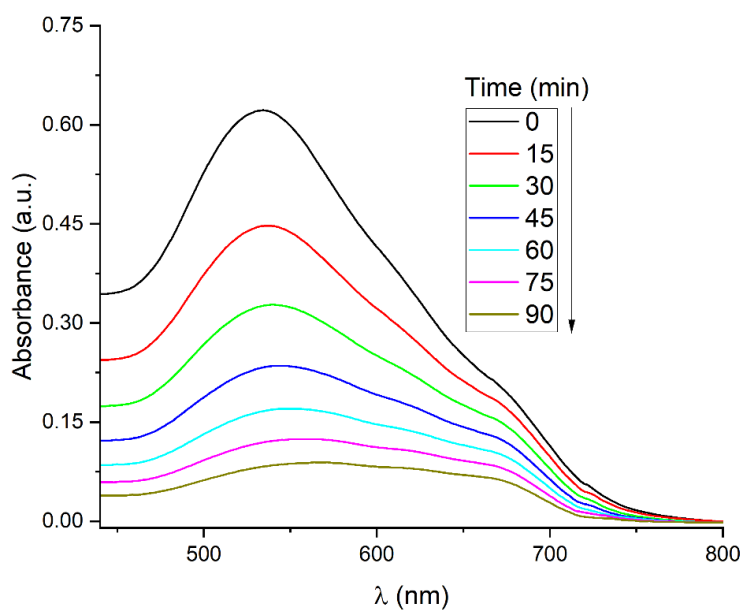
Fig. S14 Time-dependent absorption spectra of EBT dye in the presence of **2** under visible-light irradiation.

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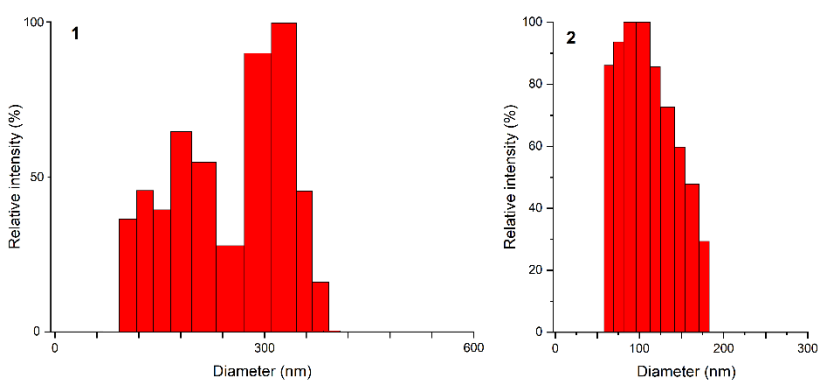**Fig. S15** Kinetics of the photocatalytic degradation of EBT dye under visible-light irradiation by photocatalysts **1** and **2**.

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Fig. S16 Typical catalytic cycle (up to consecutive 10 cycles) of photocatalyst **2** for the degradation of EBT dye.

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Table S1. Pseudo-first-order degradation rate constant of EBT dye for each cycle.

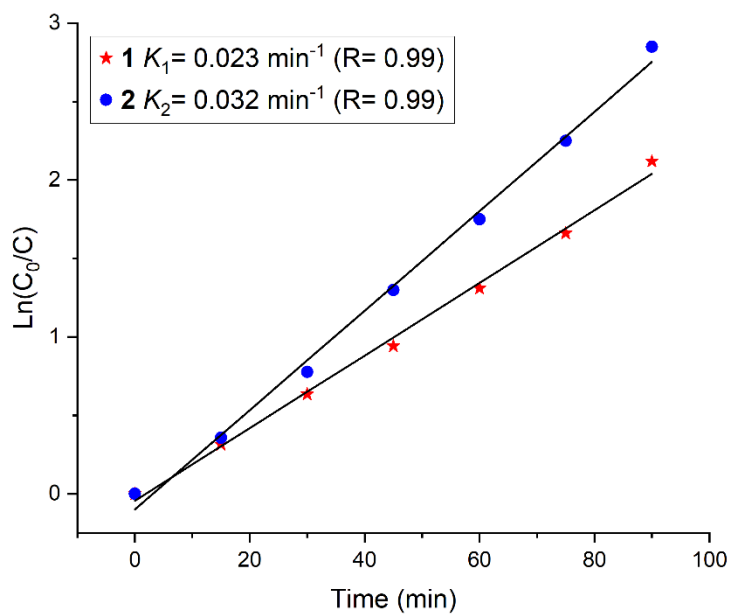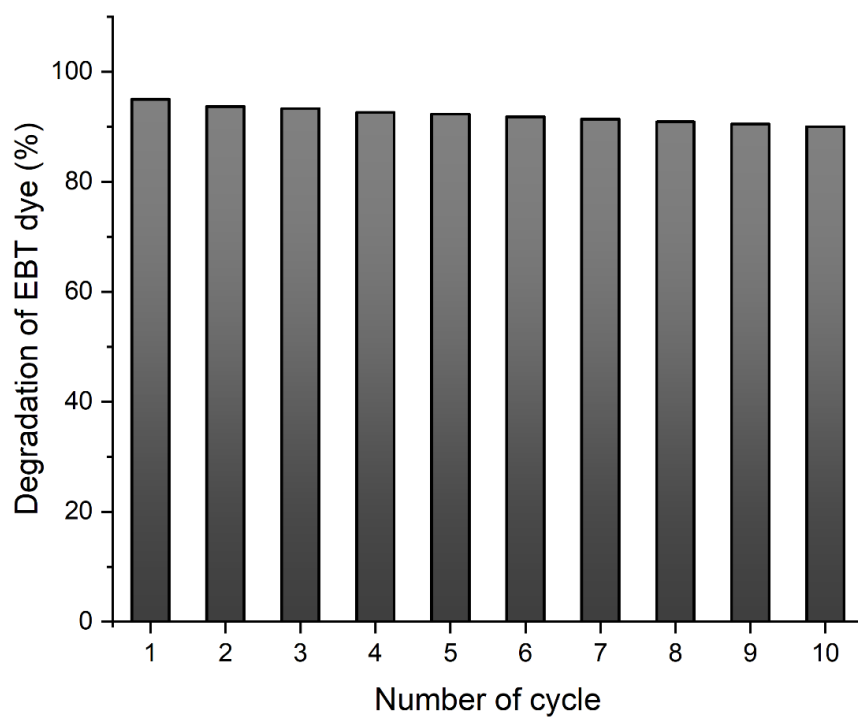| Number of cycle	Rate constant k (min^{-1})
1	0.0320
2	0.0317
3	0.0313
4	0.0309
5	0.0305
6	0.0301
7	0.0298
8	0.0295
9	0.0292
10	0.0290
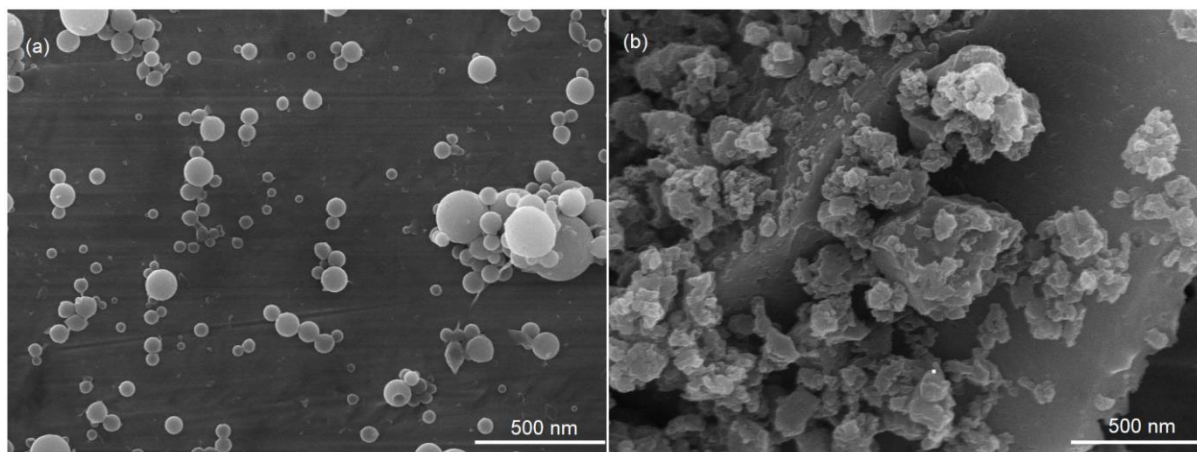
Fig. S17 Typical FE-SEM images of photocatalysts **1** (a), and **2** (b) after the degradation of EBT dye (consecutive 10 cycles).
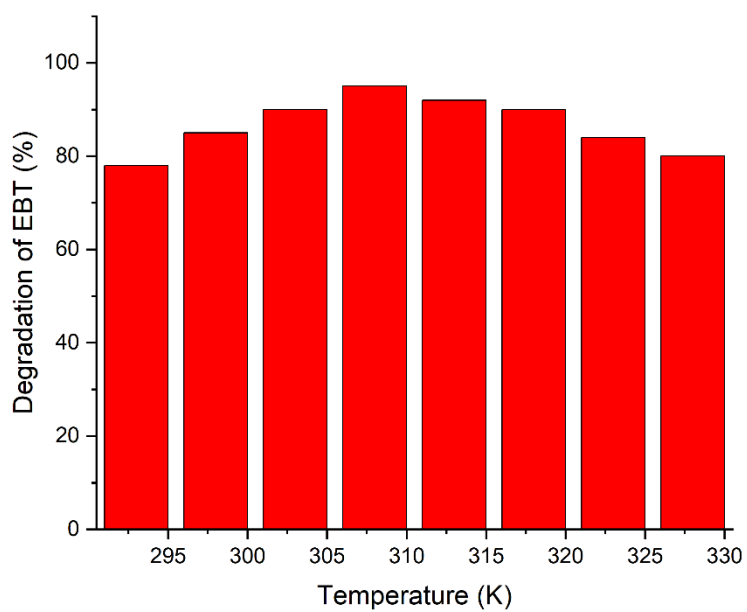
Fig. S18 Effect of temperature on the degradation of EBT dye by **2**.

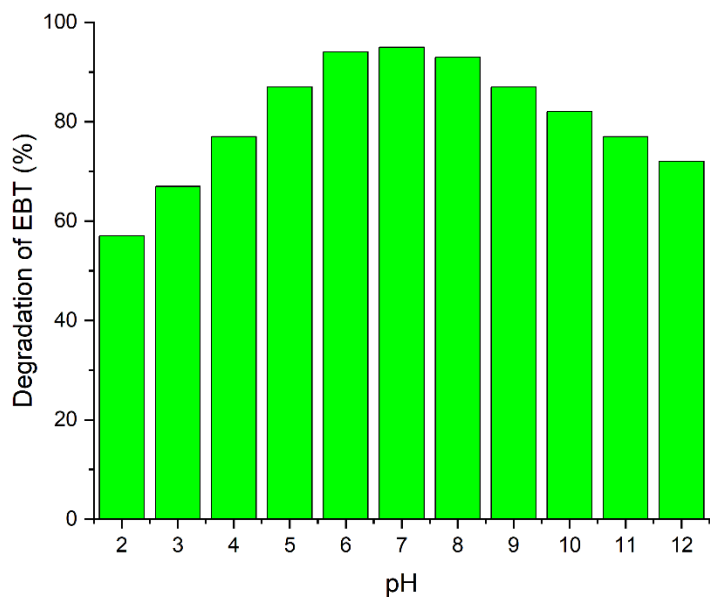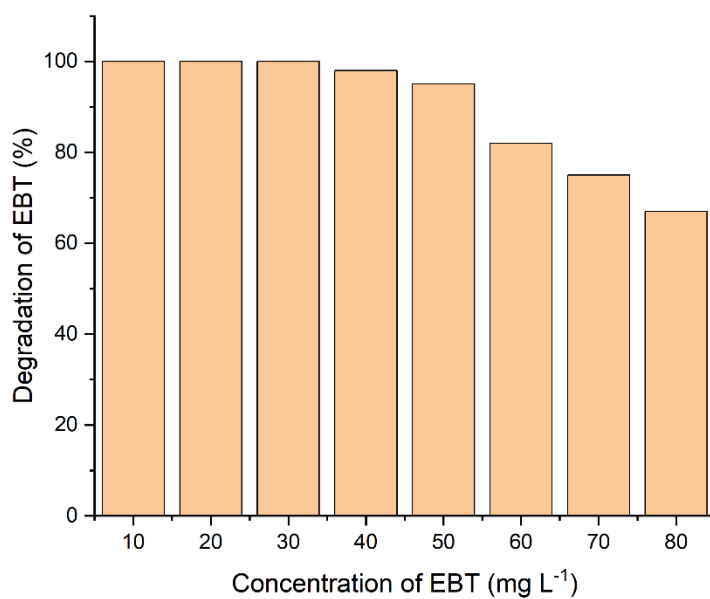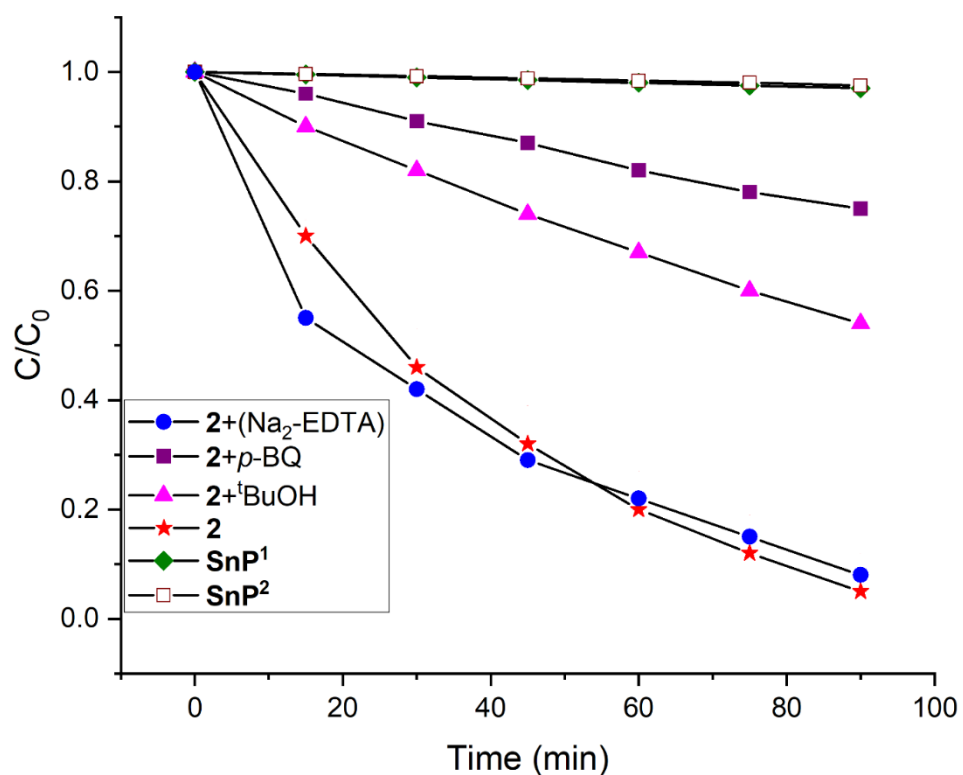**Fig. S19** Effect of pH of the EBT dye solution on the photodegradation by **2**.
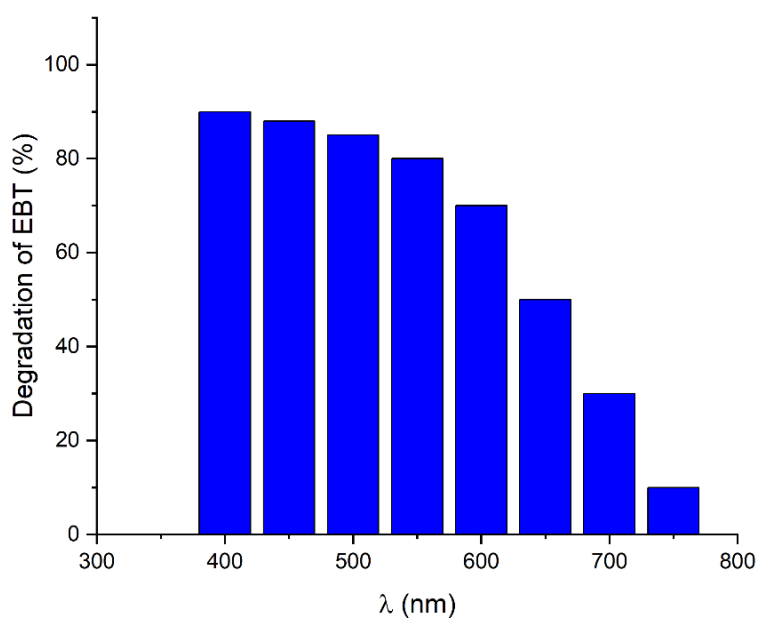

Fig. S20 Effect of EBT dye concentration on the photodegradation by **2** (20 mg) within 90 min of visible-light irradiation.
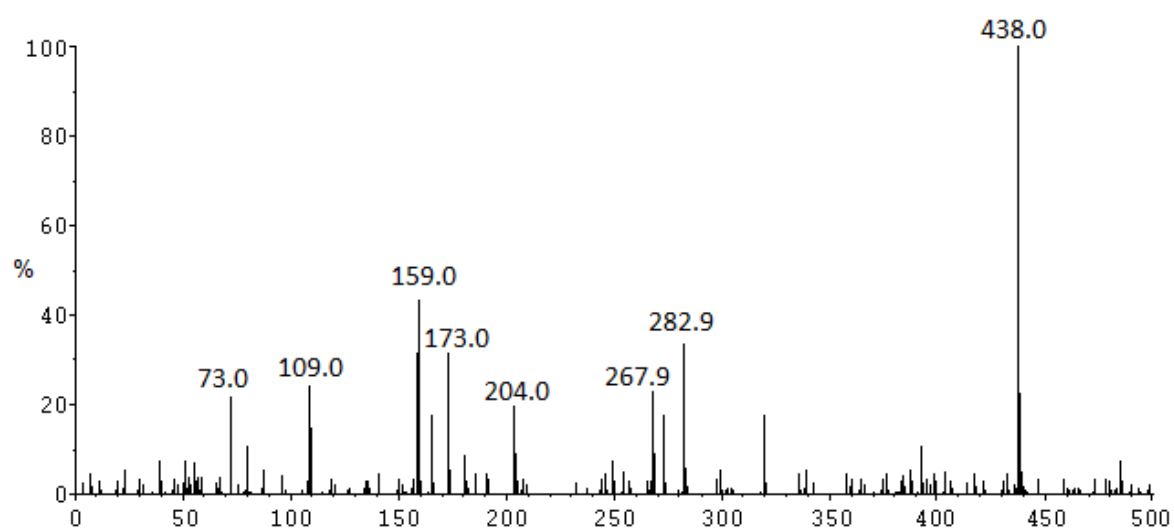
Fig. S21 Effect of various scavengers on the degradation of EBT dye in the presence of **2** under visible-light irradiation ([Na$_2$-EDTA]$_0$ = [p-BQ]$_0$ = [^{t}BuOH]$_0$ = 5mM, pH 7.0, T = 298 K). **SnP^1** and **SnP^2** were used as catalysts for comparison.

Fig. S22 Photocatalytic activities of **2** at different wavelengths for the degradation of EBT dye.

Fig. S23 Negative ion mode ESI-MS spectrum of the reaction mixture of EBT dye in the presence of **2** after 45 min of visible-light irradiation.