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Supplementary Materials

Enhanced Photocatalytic Activity of $Cs_3Bi_2Br_9$ Nanocrystals: Colloidal vs. Supported Architecture

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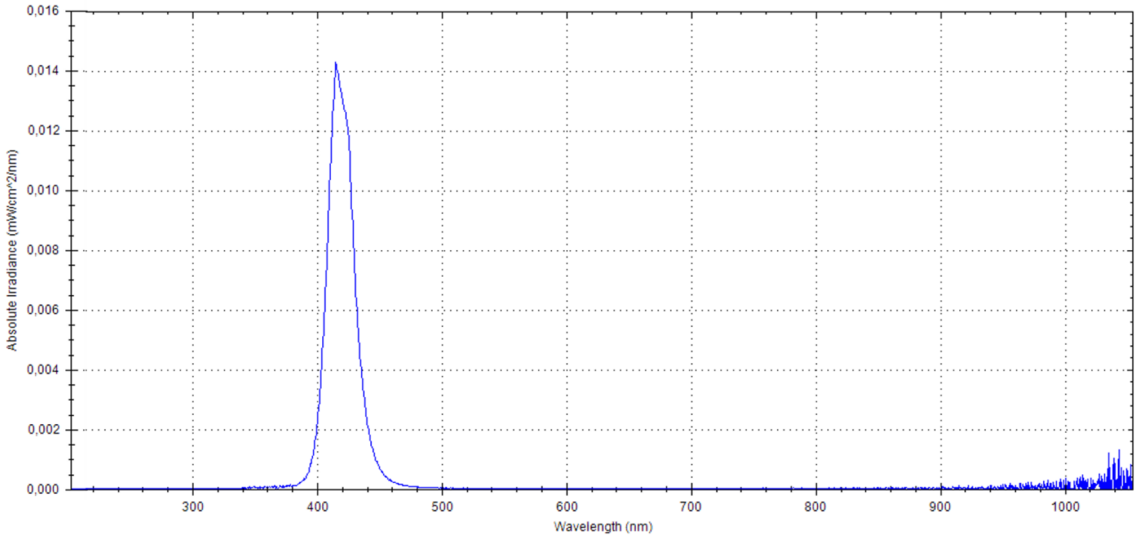


Figure S1. Emission spectrum of the LED centered at 420 nm used in photocatalytic experiments.

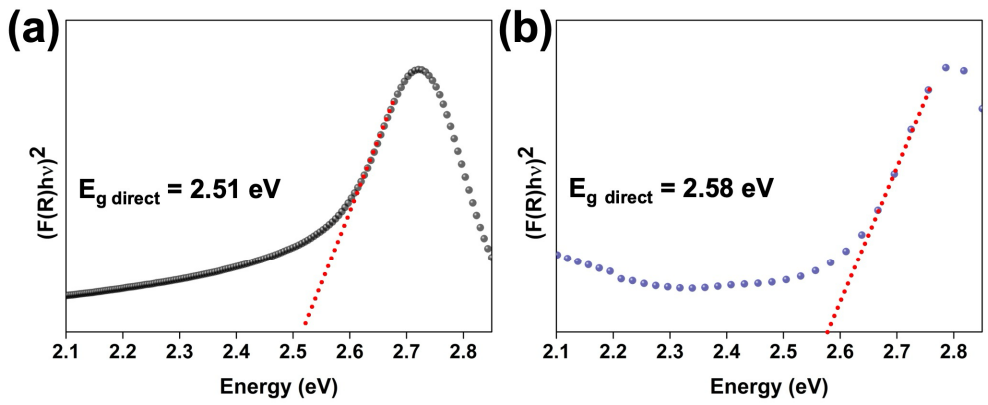


Figure S2. Tauc plot for indirect band gap calculated using the Kubelka Munk function for (**a**) cCBB NCs and (**b**) CBB@SBA-15.

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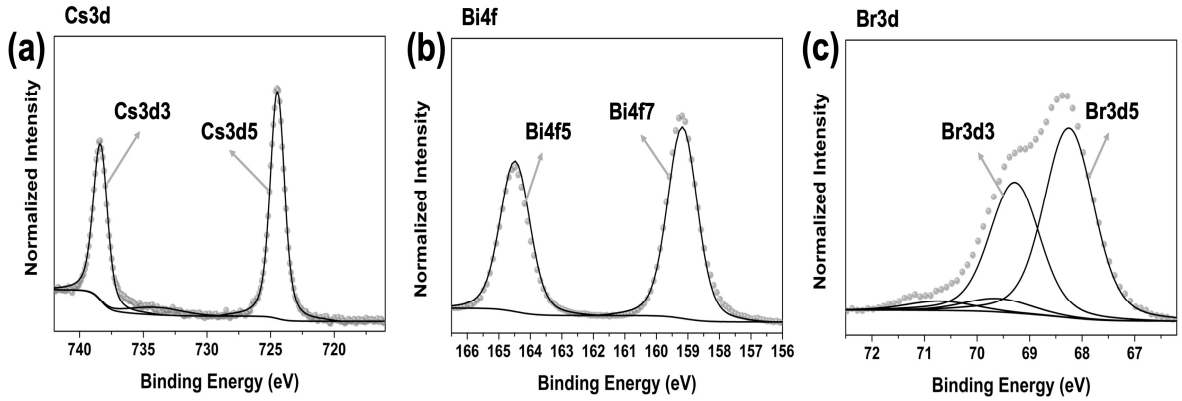


Figure S3. XPS of (**a**) Cs3d; (**b**) Bi4f; and (**c**) Br3d of cCBB NCs.

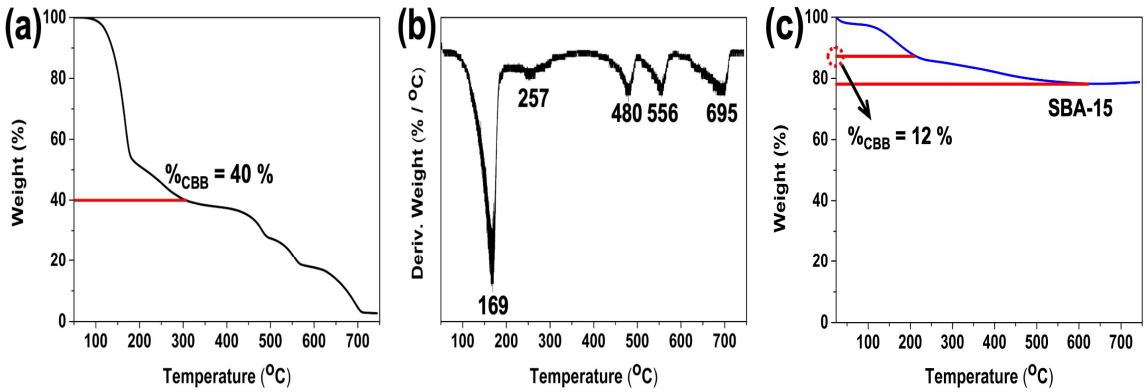


Figure S4. (**a**) TGA and (**b**) TGA first derivative curves of cCBB NCs. (**c**) TGA curves of CBB@SBA-15.

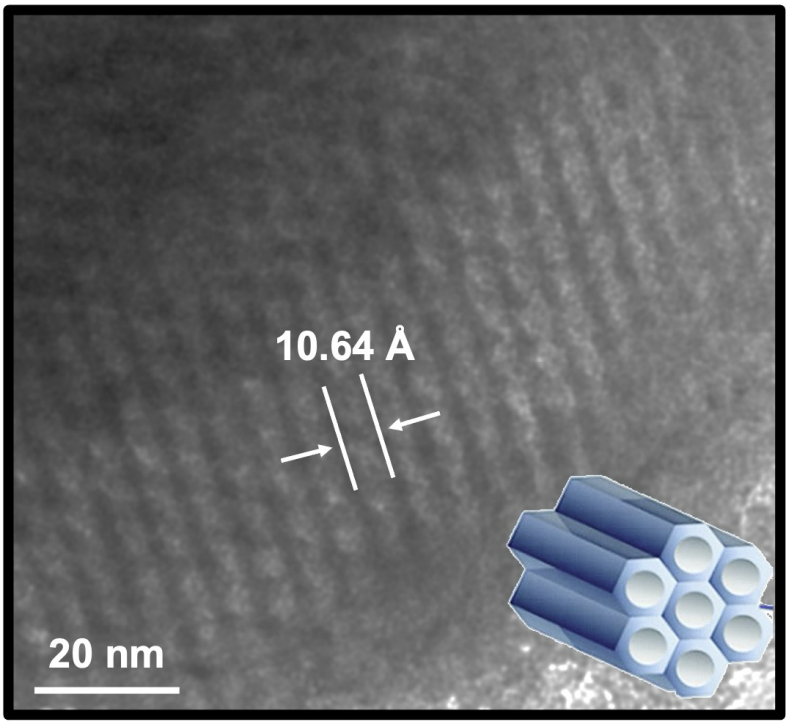


Figure S5. HRTEM image of bare SBA-15 (Scale bar 20 nm).

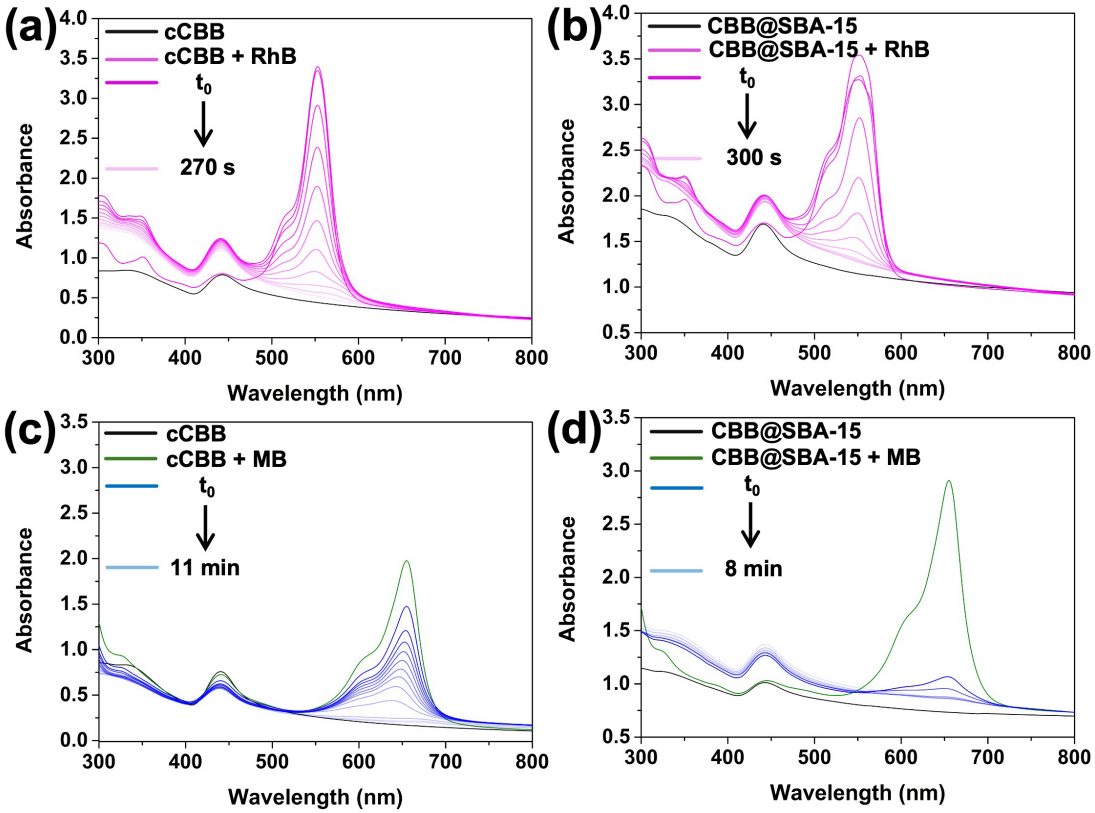


Figure S6. Photodegradation cycles of (**a**) cCBB NCs + RhB; (**b**) CBB@SBA-15 + RhB; (**c**) cCBB NCs + MB; and (**d**) CBB@SBA-15 + MB. (t_0 corresponds to the absorbance spectrum after 30 min of soft stirring in dark conditions).

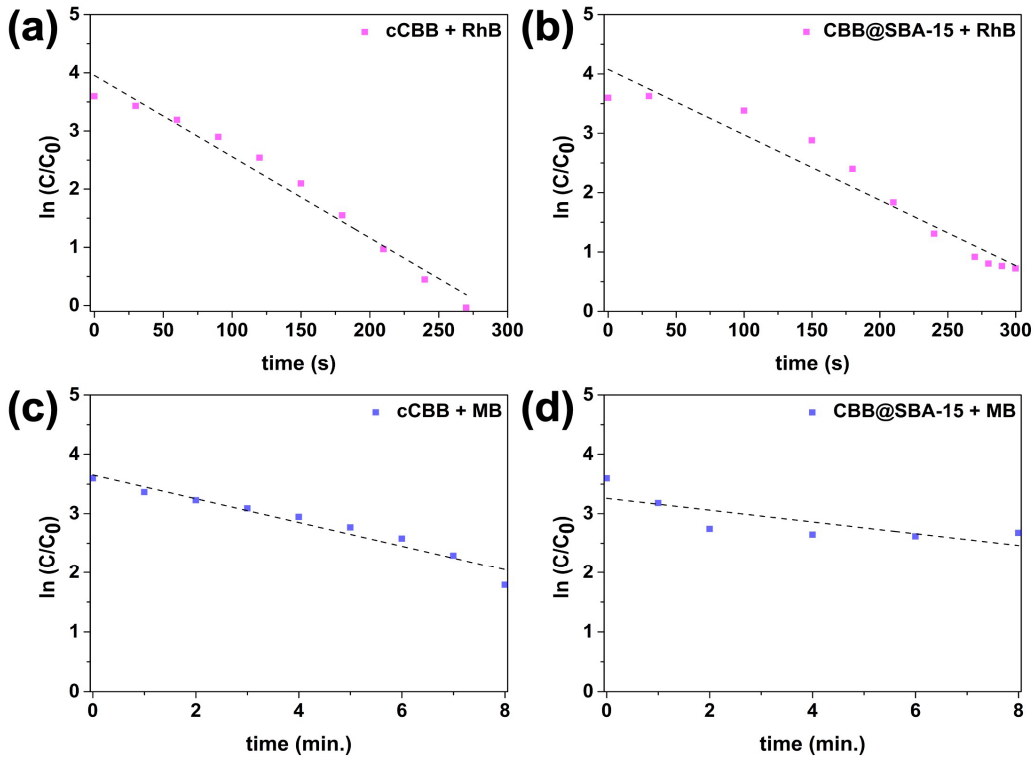


Figure S7. Plots of $\ln(C/C_0)$ versus time fitted using the pseudo-first-order Langmuir-Hinshelwood model for (**a**) cCBB NCs + RhB; (**b**) CBB@SBA-15 + RhB; (**c**) cCBB NCs + MB; and (**d**) CBB@SBA-15 + MB.

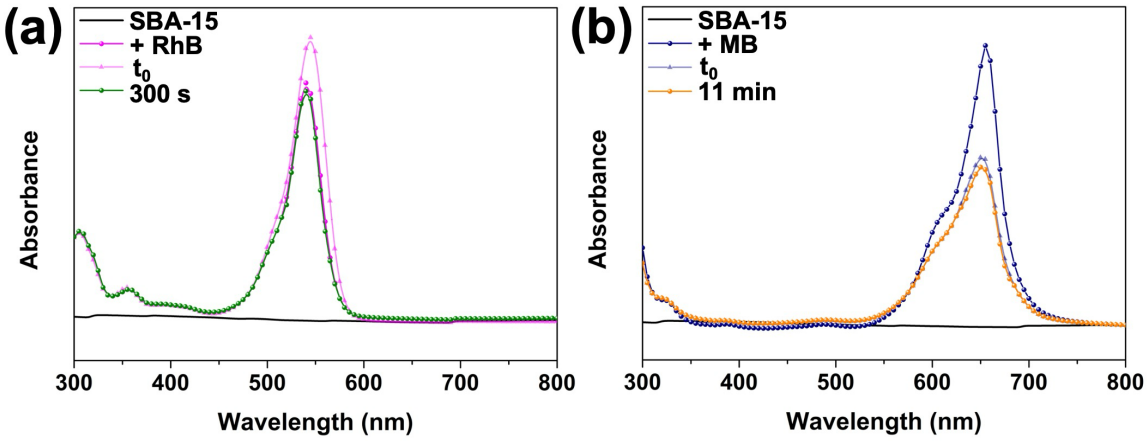


Figure S8. Control experiment in the presence of SBA-15 (without any photocatalyst) for (**a**) RhB and (**b**) MB. (t_0 corresponds to the absorbance spectrum after 30 min of soft stirring in dark conditions).

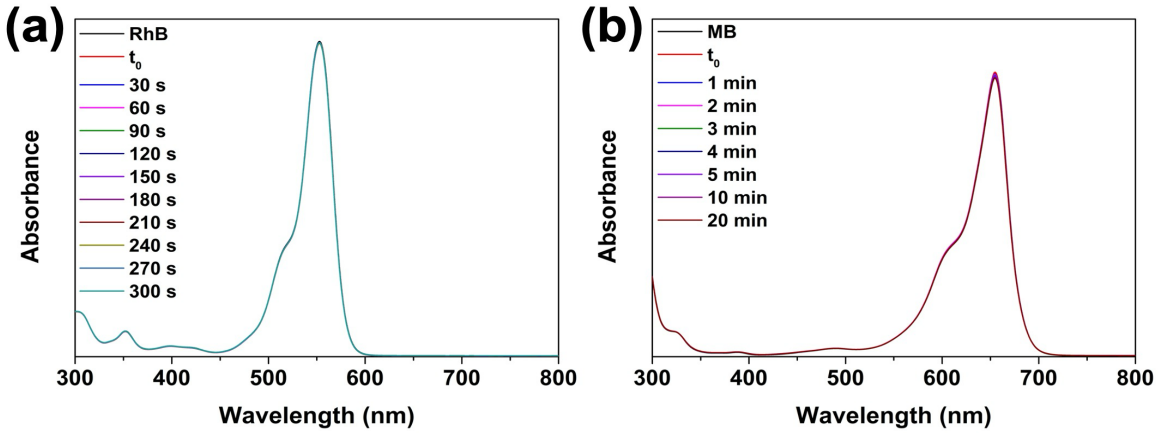


Figure S9. Absorbance spectra of (**a**) RhB and (**b**) MB upon irradiation with a LED at 420 nm for 300 s and 20 min, respectively. (t_0 corresponds to the absorbance spectrum after 30 min of soft stirring in dark conditions).

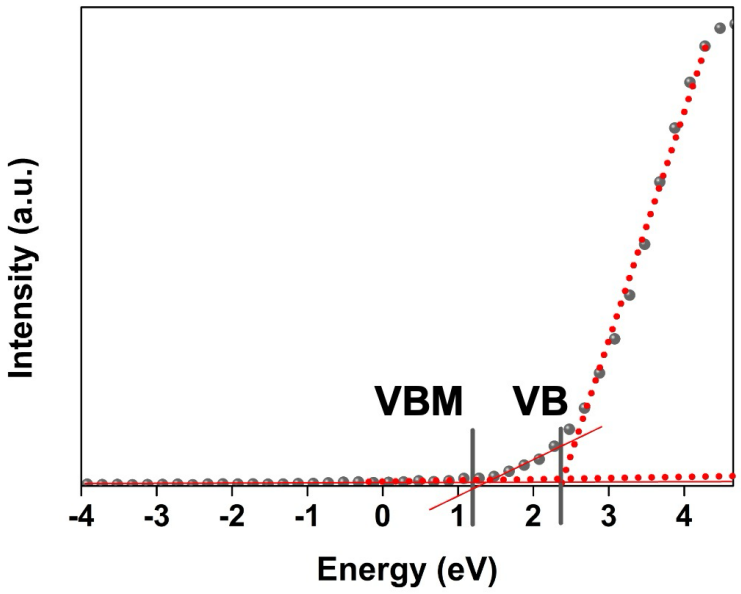


Figure S10. Valence band estimation for cCBB NCs from XPS measurements.

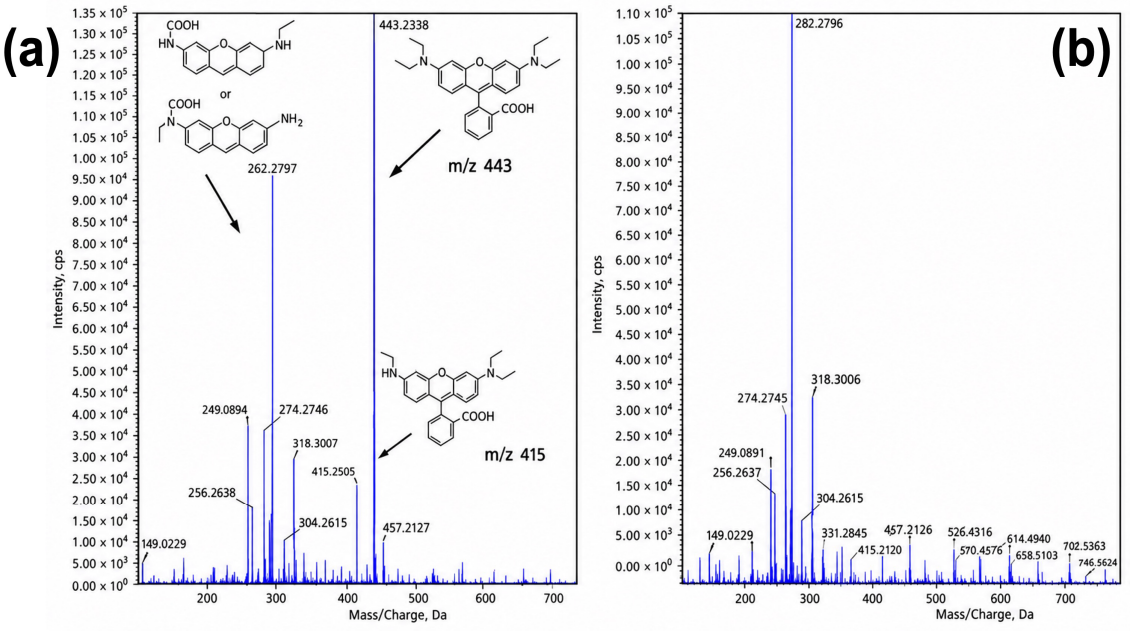


Figure S11. ESI-MS spectra of the photodegradation of RhB in the presence of cCBB NCs after (**a**) 135 sec and (**b**) 270 sec of reaction.

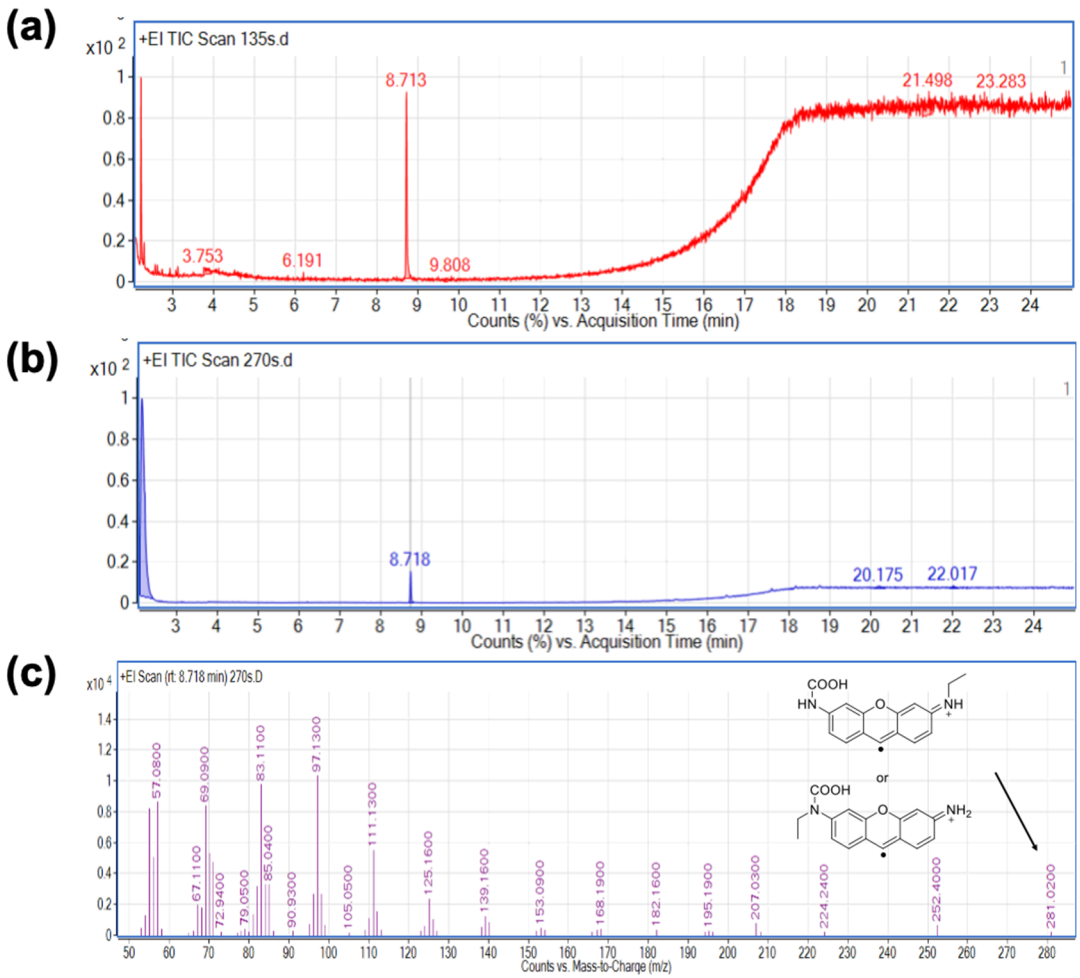


Figure S12. GC-MS chromatogram of the photocatalytic degradation of RhB in the presence of cCBB NCs after (**a**) 135 sec and (**b**) 270 sec of the irradiation. (**c**) Mass spectrum of the peak at 8.718, which corresponds to $m/z = 281$.

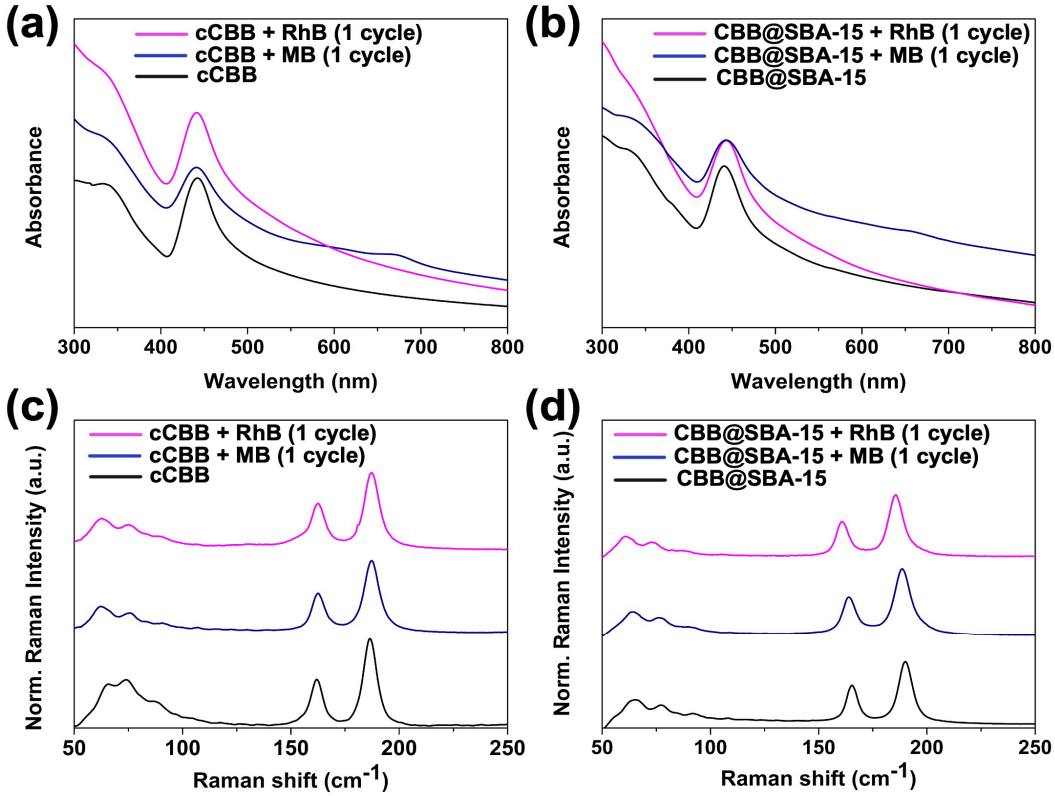


Figure S13. (**a**,**b**) Absorbance and (**c**,**d**) Raman spectra after 1 photocatalytic cycle for RhB and MB.

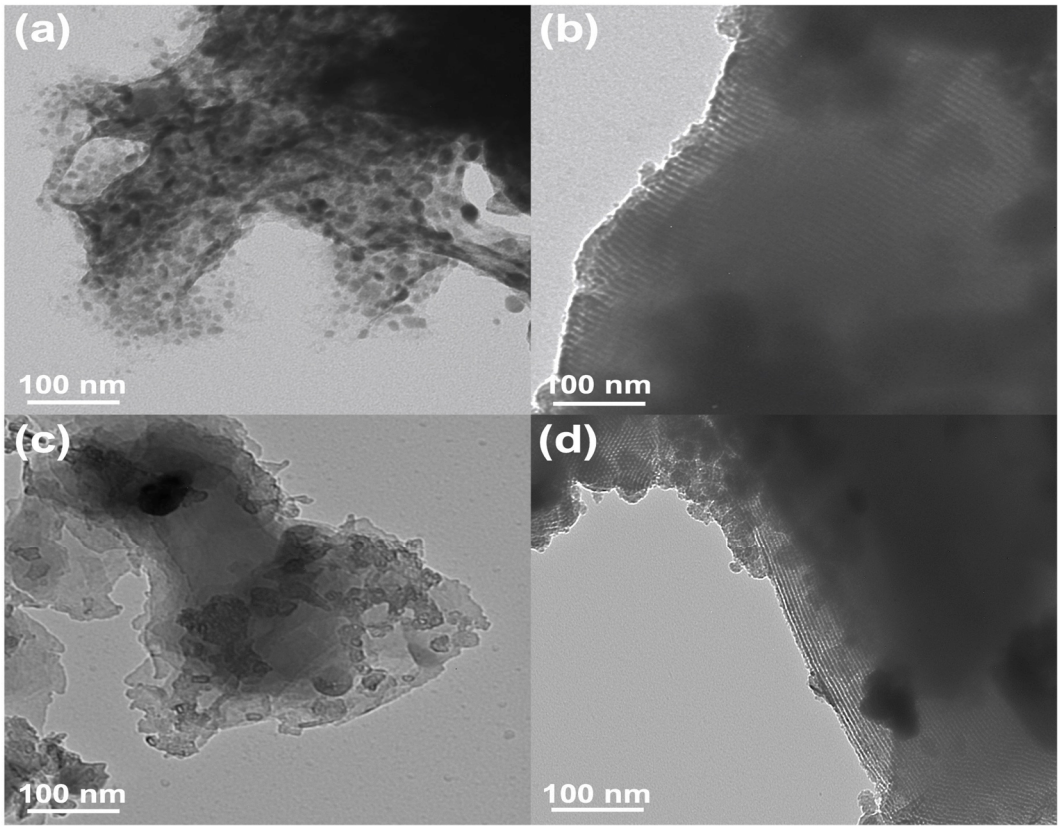


Figure S14. TEM images of (**a**) cCBB NCs + RhB; (**b**) CBB@SBA-15 + RhB; (**c**) cCBB NCs + MB; and (**d**) CBB@SBA-15 + MB after one photocatalytic cycle.

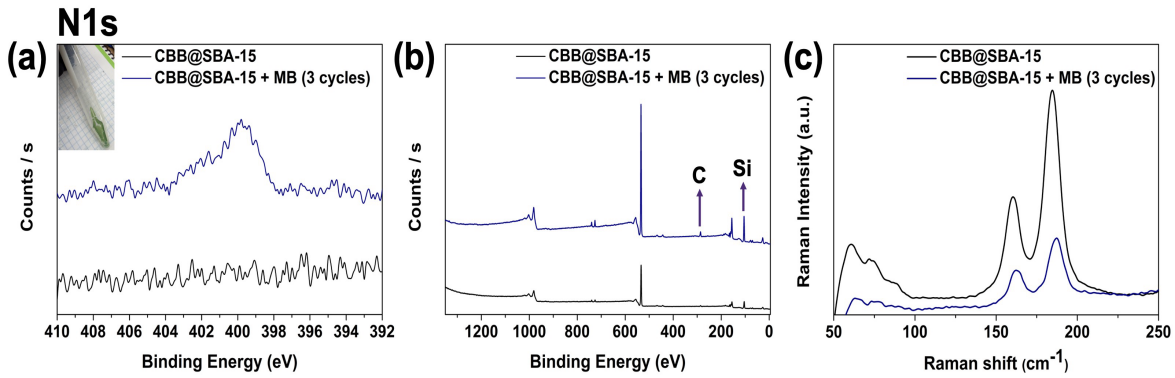


Figure S15. (**a**) High resolution spectra of N1s; (**b**) survey XPS spectra; and (**c**) Raman spectra of the samples before and after 3 photocatalytic cycles of MB photodegradation with CBB@SBA-15.

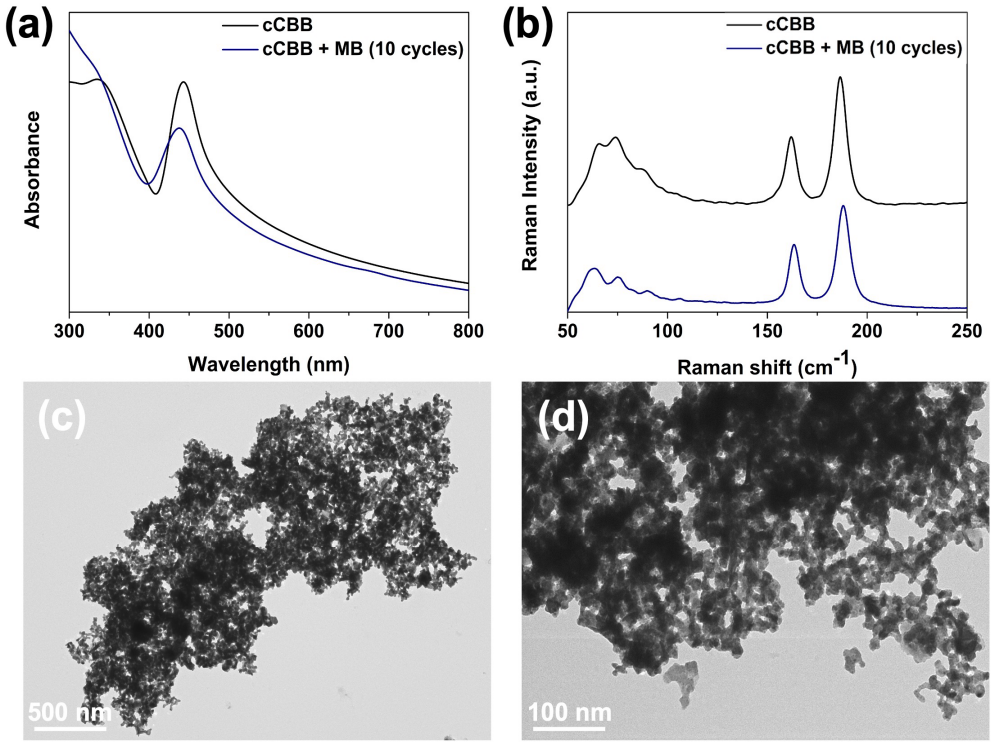


Figure S16. (**a**) Absorption spectra; (**b**) Raman spectra of the cCBB NCs before and after the 10th photocatalytic cycle of irradiation; (**c**,**d**) TEM images after the 10th photocatalytic cycle.