

Supplementary Information

BiOBr/Ti₃C₂ nanocomposites prepared via octanol solvothermal method to achieve enhanced visible photocatalytic properties

JinFeng Song ^a, XiaoRong Meng ^{a,*}, Jing Ren ^b and JunFeng Zhu ^a

^a:Xi'an University of Architecture & Technology, Sch Chem & Chem Engr, Xian 710055, Peoples R China.

^b: Xi'an University of Architecture & Technology, Sch Environm & Municipal Engr, Xian 710055, Peoples R China.

E-mail: mxr5@163.com

Phone: +86-13363949657

Address: Xian Univ Architecture & Technol, Xian 710055, Peoples R China.

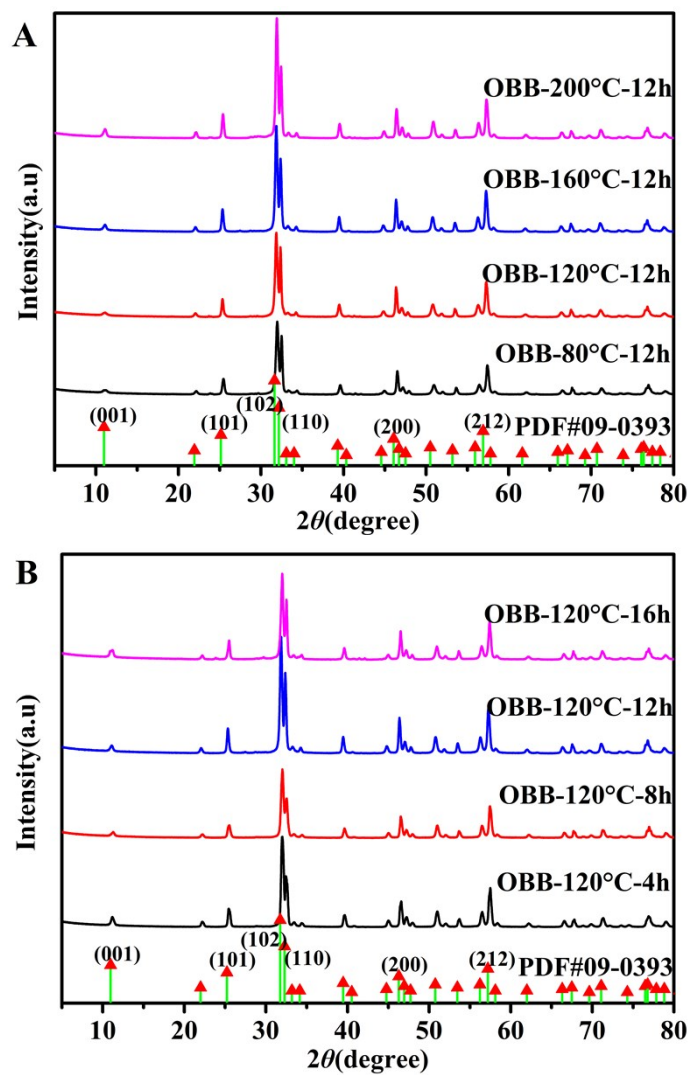


Figure S1 XRD spectra of OBB at different temperature (A) and time (B).

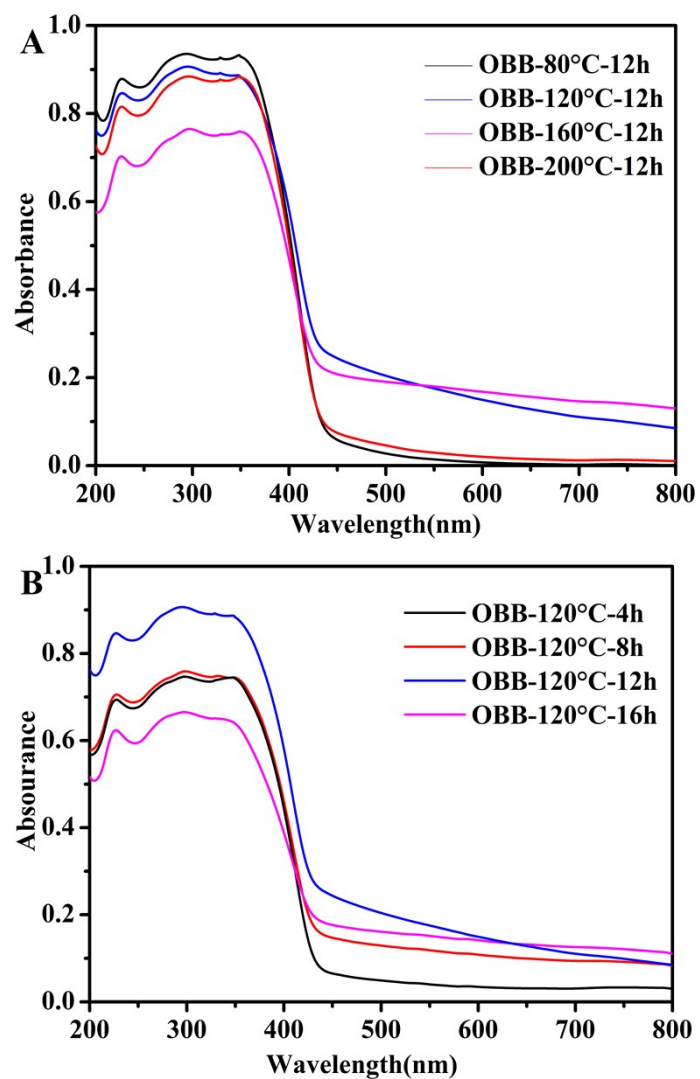


Figure S2 UV-vis diffuse reflectance spectra of OBB at different temperature (A) and time (B).

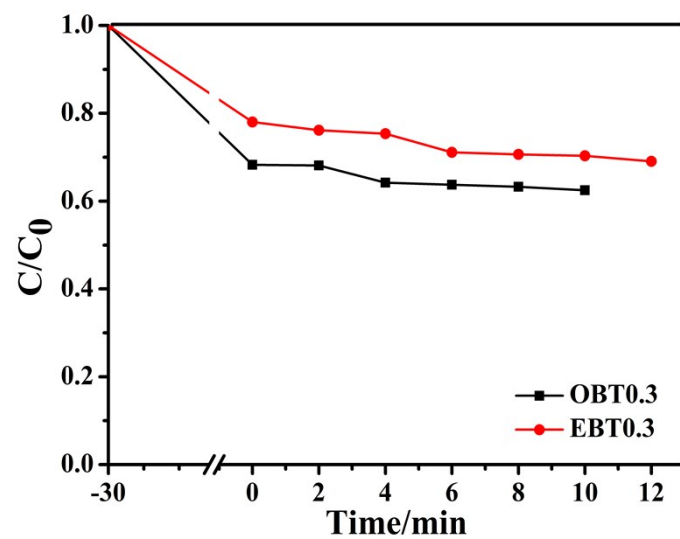


Figure S3 Dark adsorption curve of OBT0.3 and EBT0.3.

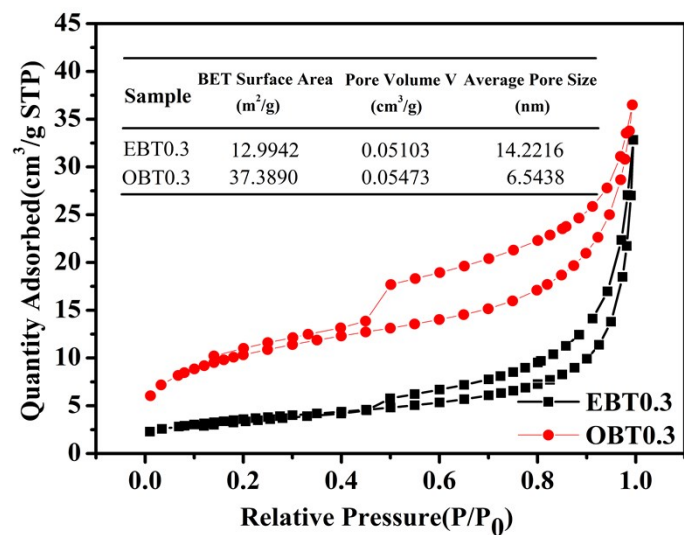


Figure S4 Nitrogen adsorption and desorption isotherms of OBT0.3 and EBT0.3.

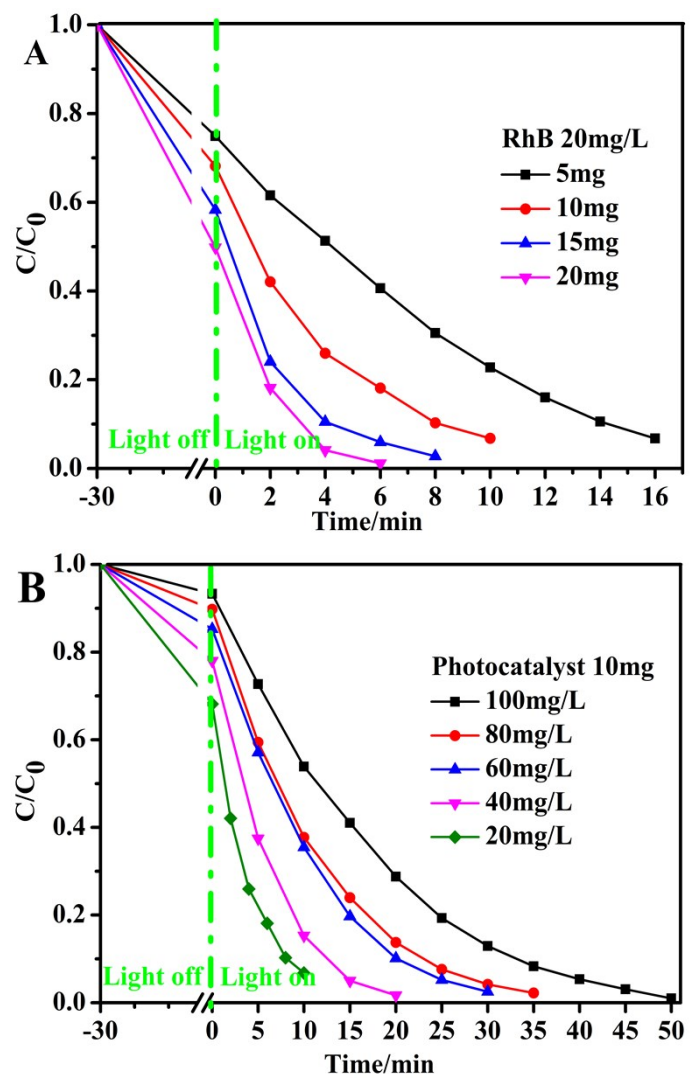


Figure S5 The Photocatalytic degradation curve of RhB with different amount of OBT0.3 (A) and different dye concentration (B).

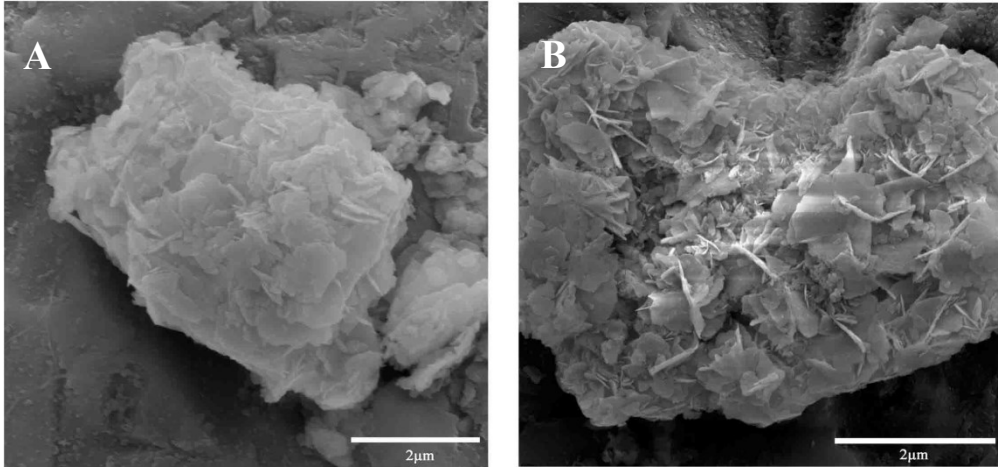


Figure S6 SEM images of (A) OBT0.3(120°C, 4h) and (B) OBT0.3(120°C, 8h).

Table S1 Comparison of properties between octanol and ethylene glycol *

	Dielectric constant/ ϵ	Viscosity/mPa.S
Ethylene glycol	41.4	16.1(25°C)6.554(50°C) 3.340(75°C)1.975(100°C)
Octanol	10.3	7.288(25°C)3.232(50°C) 1.681(75°C)0.991(100°C)

*Data from: The 84th Edition of the CRC Handbook of Chemistry and Physics.

Table S2 Comparison of degradation of rhodamine B by BiOBr/Ti₃C₂ composites prepared in other literature

Photo-catalyst	method	mass (mg)	Dye (concentration)	Volume	Light source	Dark reaction and photodegradation reaction time	Degradation efficiency	Reference
BiOBr/Ti ₃ C ₂	Ethylene glycol as solvent, 80 °C, 2h	50mg	RhB(20mg/L)	100mL	Xe Lamp (300W)	30min+ 50min	~99%	[1]
BiOBr/Ti ₃ C ₂	Hydrolysis preparation	10mg	RhB(20mg/L)	50mL	Xe Lamp (300W)	30min+ 24min	~97%	[2]
BiOBr/Ti ₃ C ₂	Water as solvent, 160 °C, 18h	100mg	RhB(10mg/L)	100mL	Xe Lamp (300W)	15min+ 60min	~99%	[3]
BiOBr/TiO ₂ /Ti ₃ C ₂	Water as solvent, 120 °C, 24h	20mg	RhB(100mg/L)	50mL	Xe Lamp (300W)	30min+ 30min	99.8%	[4]
BiOBr/Ti ₃ C ₂ (OBT0.3)	Octanol as solvent, 120 °C, 12h	10mg	RhB(20mg/L)	50mL	Xe Lamp (300W)	30min+ 10min	99.3%	This Work

Notes and references

- [1] Liu C , Xu Q , Zhang Q , et al. Layered BiOBr/Ti₃C₂ MXene composite with improved visible-light photocatalytic activity. *Journal of Materials Science*, 2018, 54(3):2458-2471.
- [2] Huang Q S, Liu Y , Cai T , et al. Simultaneous removal of heavy metal ions and organic pollutant by BiOBr/Ti₃C₂ nanocomposite. *Journal of Photochemistry and Photobiology A: Chemistry*, 2019, 375:201-208.
- [3] Li Z Z , Zhang H G , Wang L , et al. 2D/2D BiOBr/Ti₃C₂ heterojunction with dual applications in both water detoxification and water splitting. *Journal of Photochemistry and Photobiology A: Chemistry*, 2020, 386:112099.
- [4] Xu, T X , Wang, J P , Cong, Y , et al. Ternary BiOBr/TiO₂/Ti₃C₂T_x MXene nanocomposites with heterojunction structure and improved photocatalysis performance. *Chinese Chemical Letters*, 2020, 31(4):1022-1025.