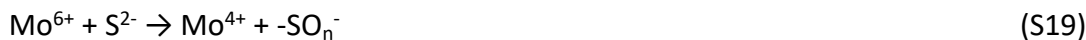
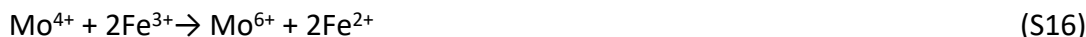
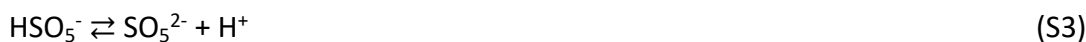


## Supplementary Information

### Nano-nebula superstructure decorated wood-derived biochar for efficient and rapid antibiotic degradation

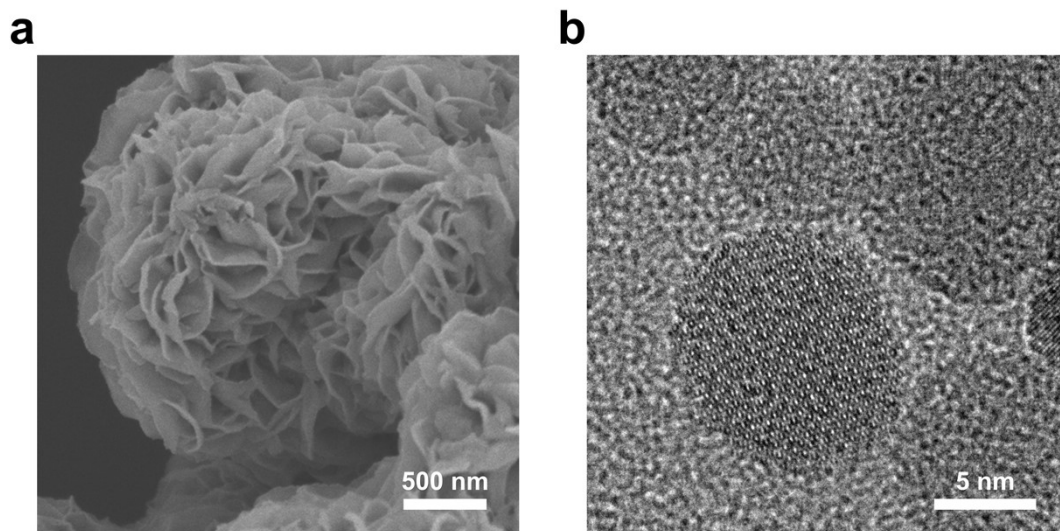
Yilong Cui,<sup>a</sup> Yubo Liu,<sup>a</sup> Xin Jin,<sup>a</sup> Yunyi Liang,<sup>a</sup> Yingkuan Du,<sup>a</sup> Weiqiang Chen,<sup>a</sup> Nanfeng Zhu<sup>a</sup> and Changlei Xia<sup>\*\*a</sup>

#### Potential reaction equations involved in this study

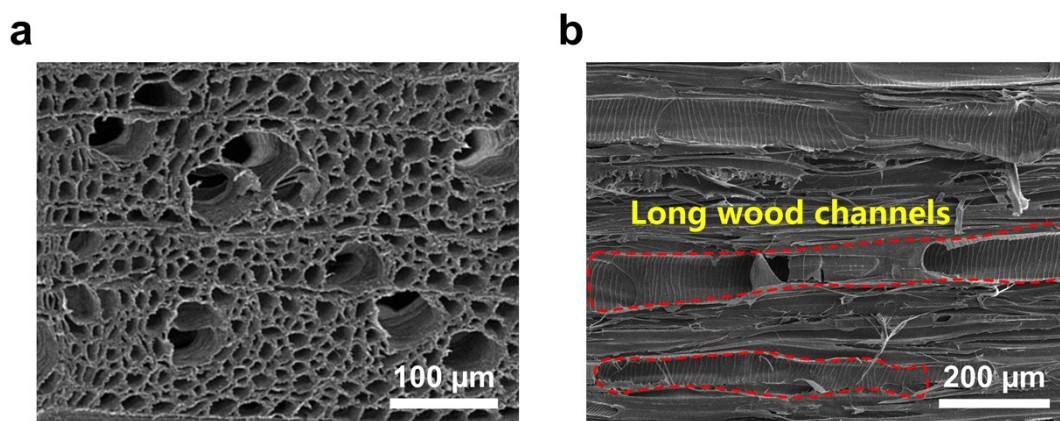


**Table S1.** Comparison of catalytic performance for TC removal among similar catalytic systems.

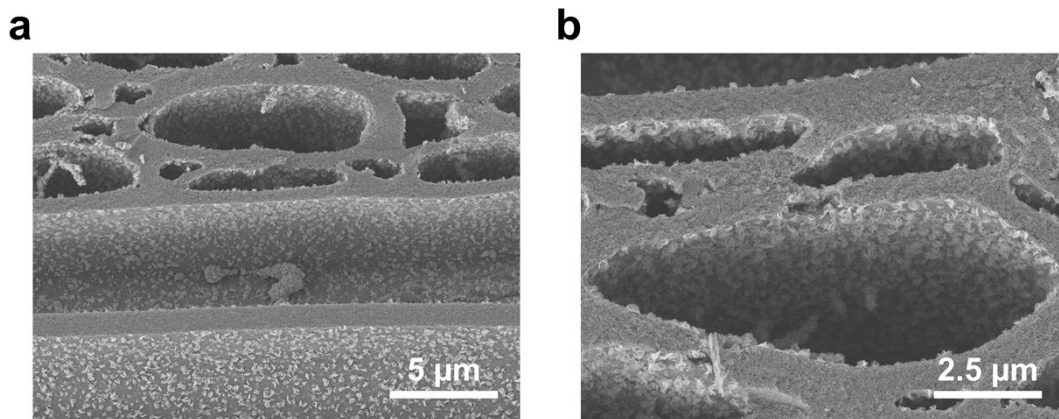
| System   | Material Form    | Pollutant | Pollutant concentration (mg/L) | Reaction time (min) | Removal efficiency (%) | Ref.      |
|--|------------------|-----------|--------------------------------|---------------------|------------------------|-----------|
| Fe <sup>0</sup> -Fe <sub>3</sub> O <sub>4</sub> @MoS <sub>2</sub> /PMS | Powder           | TC        | 20                             | 120                 | 96.81                  | 1         |
| FeS@BC/PS  | Powder           | TC        | 200                            | 30                  | 87.4                   | 2         |
| Fe/Mo-BC/PS  | Powder           | TC        | 20                             | 60                  | 90.93                  | 3         |
| FBC/PMS  | Powder           | TC        | 30                             | 60                  | 91                     | 4         |
| 6PA-Ni4/PS   | Powder           | TC        | 20                             | 180                 | 94.55                  | 5         |
| N-BCFe/PS  | Powder           | TC        | 10                             | 120                 | 86.56                  | 6         |
| Fe-N@MFC/PS  | Powder           | TC        | 5                              | 60                  | 90.5                   | 7         |
| MIL-88A (Fe)/CoFe <sub>2</sub> O <sub>4</sub> /PS                      | Powder           | TC        | 10                             | 60                  | 90                     | 8         |
| MgFe <sub>2</sub> O <sub>4</sub> -BC/PS                                | Powder           | TC        | 30                             | 90                  | 94.7                   | 9         |
| BCNNSP/PMS   | Monolithic block | TC        | 20                             | 60                  | 94                     | This work |



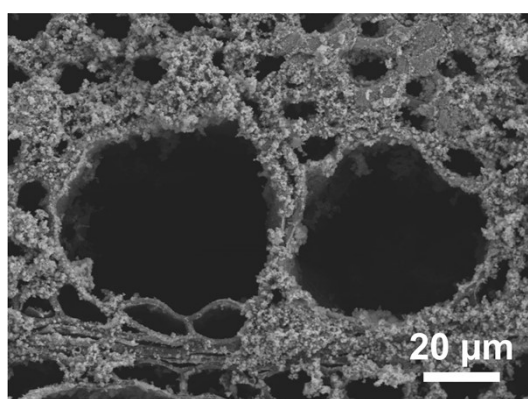
**Fig. S1** (a) SEM image of the MoS<sub>2</sub>. (b) TEM image of the Fe<sub>3</sub>O<sub>4</sub>.



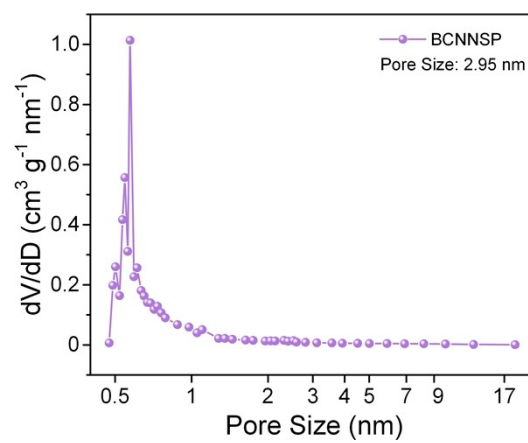
**Fig. S2** SEM images of (a) cross-section and (b) longitudinal section of basswood.



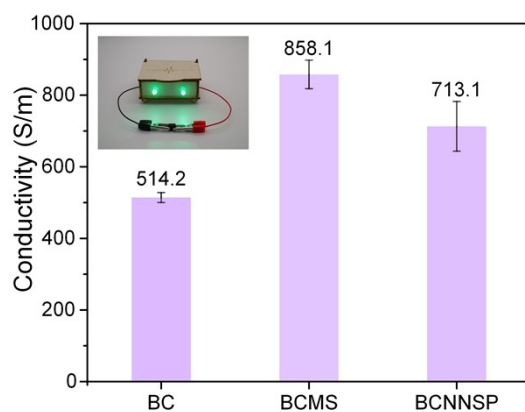
**Fig. S3** SEM image of the BCMS.



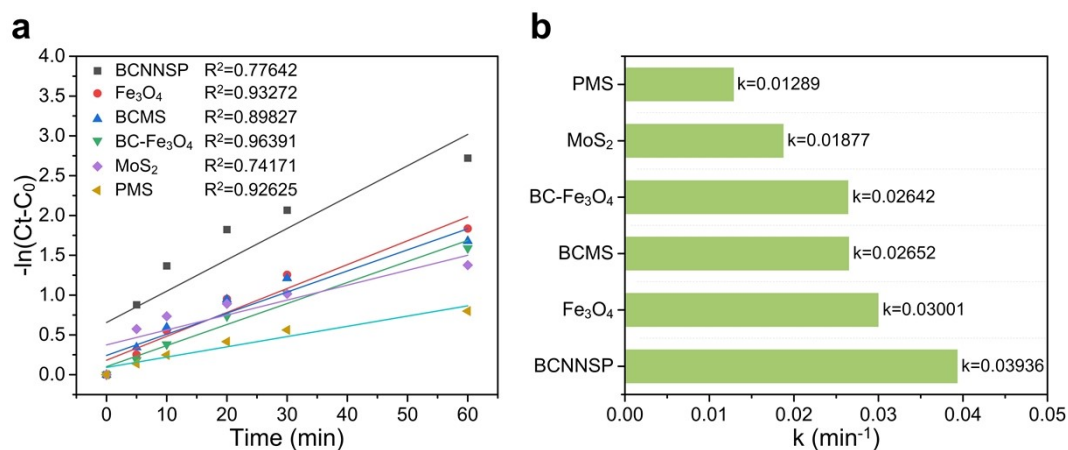
**Fig. S4** SEM image of the BCNNSP.



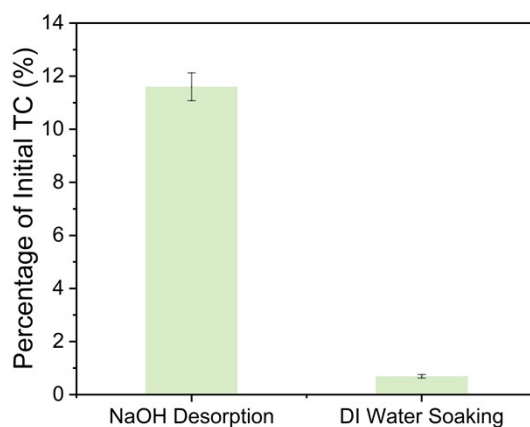
**Fig. S5** The pore size of BCNNSP.



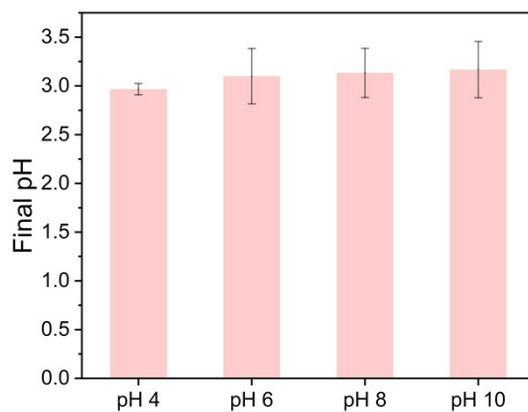
**Fig. S6** Schematic diagram illustrating the electrical conductivity of BC, BCMS, and BCNNSP, along with the illumination of an LED by BCNNSP.



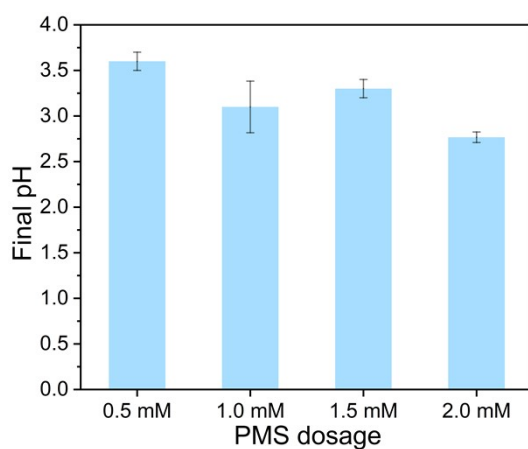
**Fig. S7** (a) Pseudo-first-order kinetic fitting for TC degradation by different catalysts. (b) The corresponding TC degradation rate constants.



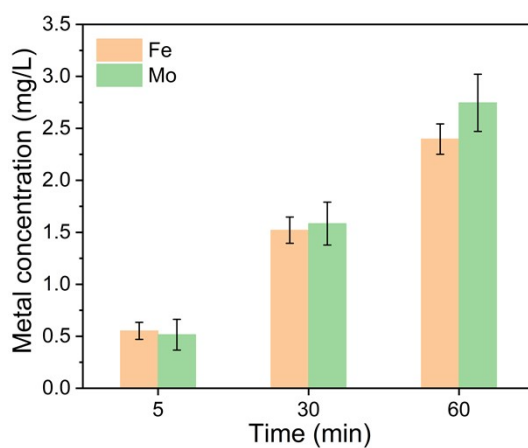
**Fig. S8** Quantitative evaluation of TC residues on the post-reaction BCNNSP via NaOH desorption and DI water soaking.



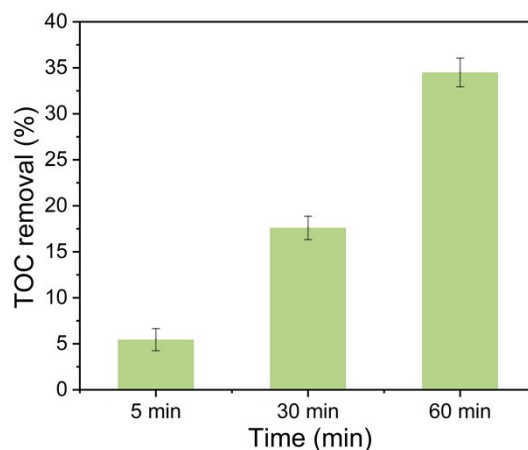
**Fig. S9** Final pH of the BCNNSP/PMS system in solutions with different initial pH values.



**Fig. S10** Final pH of the BCNNSP/PMS system at different PMS concentrations.



**Fig. S11** Concentrations of leached Fe and Mo ions in the BCNNSP/PMS system after the reaction.



**Fig. S12** The TOC removal of TC in the BCNNSP/PMS system.

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