BEILSTEIN JOURNAL OF NANOTECHNOLOGY

# Supporting Information

for

# Spindle-like MIL101(Fe) decorated with $Bi_2O_3$ nanoparticles for enhanced degradation of chlortetracycline under visible-light irradiation

Chen-chen Hao, Fang-yan Chen, Kun Bian, Yu-bin Tang and Wei-long Shi

*Beilstein J. Nanotechnol.* **2022,** *13,* 1038–1050. doi:10.3762/bjnano.13.91

## Additional figures and tables

**Table S1:** BET surface area, pore volume, and pore size of $Bi_2O_3$, MIL101(Fe), and and BOM-20.

| Samples | $S_{BET}$ ($m^2/g$) | $V_p$ ($cm^3/g$) | Pore size (Å) |
|---|---|---|---|
| MIL101(Fe) | 276.35 | 0.42 | 25.64 |
| $Bi_2O_3$ | 6.19 | 0.01 | 62.6 |
| BOM-20 | 60.23 | 0.12 | 47.8 |

**Table S2:** Comparison of photocatalytic efficiencies of other previously reported photocatalysts for degradation of CTC in recent years.

| **Photocatalysts** | **Dosage of catalyst (g/L)** | **CTC concentration (mg/L)** | **Reaction time (min)** | **Degradation rate (%)** | **Ref.** |
|---|---|---|---|---|---|
| **Ce-MOF/GO/$Fe_3O_4$** | 0.45 | 20 | 180 | 80.5 | [S1] |
| **$Zn_{0.75}Mn_{0.75}Fe_{1.5}O_4$/Zn $Fe_2O_4$/ZnO** | 0.4 | 10 | 120 | 61.9 | [S2] |
| **CNPs** | 0.1 | 10 | 120 | 82.2 | [S3] |
| **3Co/0.3$ZnIn_2S_4$/GaN** | 0.4 | 10 | 120 | 81.0 | [S4] |
| **$Bi_{1.81}MnNbO_{6.72}$/sulfite** | 0.3 | 20 | 120 | 76.2 | [S5] |
| **$Co_2SnO_4$-$SnO_2$/GC** | 0.4 | 10 | 80 | 83.0 | [S6] |
| **BP-$BiVO_4$** | 0.15 | 10 | 120 | 88.0 | [S7] |
| **BOM-20** | **0.3** | **20** | **120** | **88.2%** | **this work** |

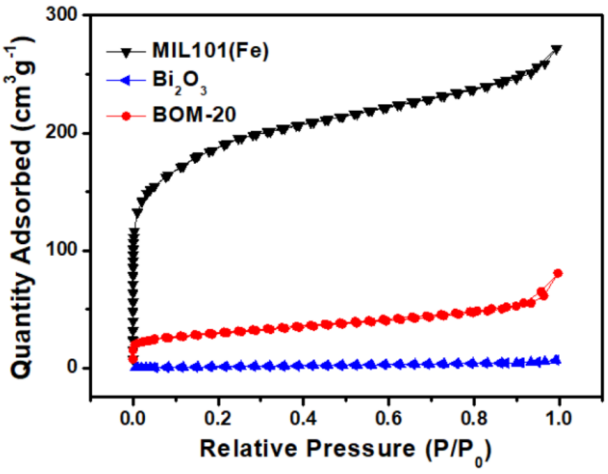


**Figure S1:** $N_2$ adsorption–desorption isotherms.

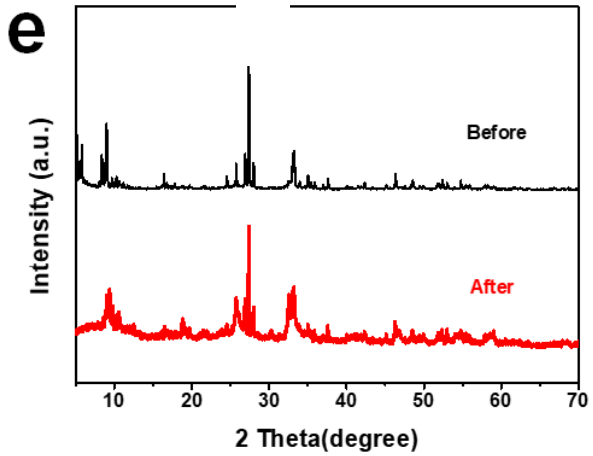


**Figure S2:** XRD patterns of the BOM-20 before and after the cyclic test.

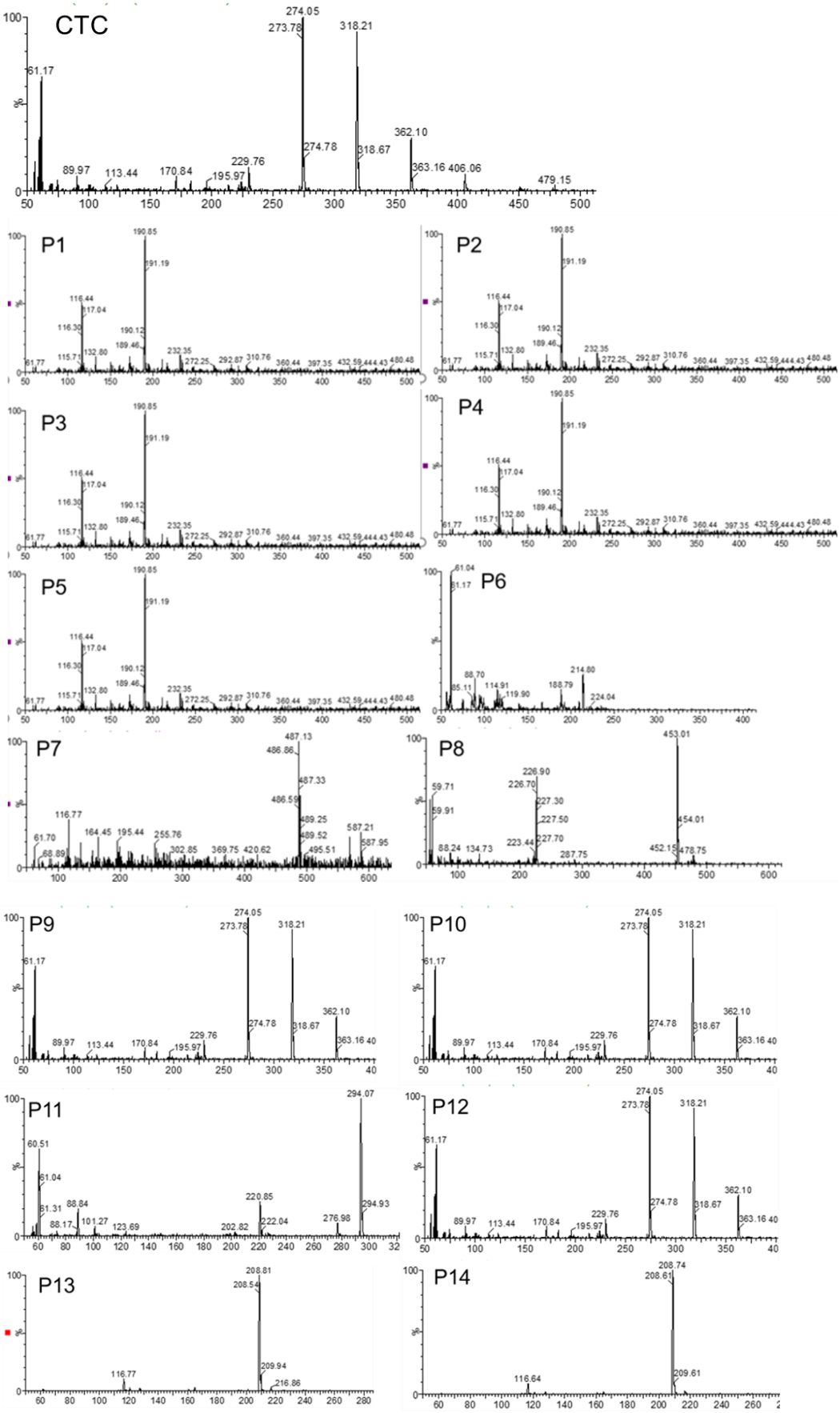


**Figure S3:** Liquid chromatography–mass spectroscopy results of TCT and intermediates.

## References

[S1] Y. Bai, M. Han, X. Li, S. Feng, L. Lu, S. Ma, Facile and efficient photocatalyst for degradation of chlortetracycline promoted by $H_2O_2$. Inorg. Chem. Front. **2022**, 9, 2952-2963.

[S2] Fu, J., Yu, X., Li, Z. et al. Study on the degradation of chlortetracycline hydrochloride in mariculture wastewater by $Zn_{0.75}Mn_{0.75}Fe_{1.5}O_4/ZnFe_2O_4/ZnO$ photocatalyst. Water Air Soil Pollut. **2021**, 232, 12.

[S3] X. Liu, W. Hou, Y. Huang, H. Zhao, Z. Song, Y. Huang, Facile and green synthesis of carbon nanopinnacles for the removal of chlortetracycline: Performance, mechanism and biotoxicity. Chem. Eng. J., **2022**, 433, 133822.

[S4] Y. He, J. Shi, Q. Yang, Y. Tong, Z. Ma, L. B. Junior, B. Yao, Co-doped 3D petal-like $ZnIn_2S_4$/GaN heterostructures for efficient removal of chlortetracycline residue from real pharmaceutical wastewater. Chem. Eng. J., **2022**, 446, 137355.

[S5] J. Zhao, Q. Song, Q. He, D. D. Dionysiou, F. Wu, Y. Feng, X. Zhang. Fabrication of $Bi_{1.81}MnNbO_{6.72}$/sulfite system for efficient degradation of chlortetracycline. Chemosphere. **2021**, 268, 129269.

[S6] J. Zheng, L. Zhang, Rational design and fabrication of multifunctional catalyzer $Co_2SnO_4$-$SnO_2$/GC for catalysis applications: photocatalytic degradation/catalytic reduction of organic pollutants. Appl. Catal. B: Environ., **2018**, 231, 34-42.

[S7] M. Zhang, Q. Shi, X. Cheng, et al., Accelerated generation of hydroxyl radical through surface polarization on $BiVO_4$ microtubes for efficient chlortetracycline degradation. Chem. Eng. J., **2020**, 400, 125871.