

## Supporting Information

# Synthesis of Hybrid Nanocomposites of ZIF-8 with Two-dimensional Black Phosphorus for Photocatalysis

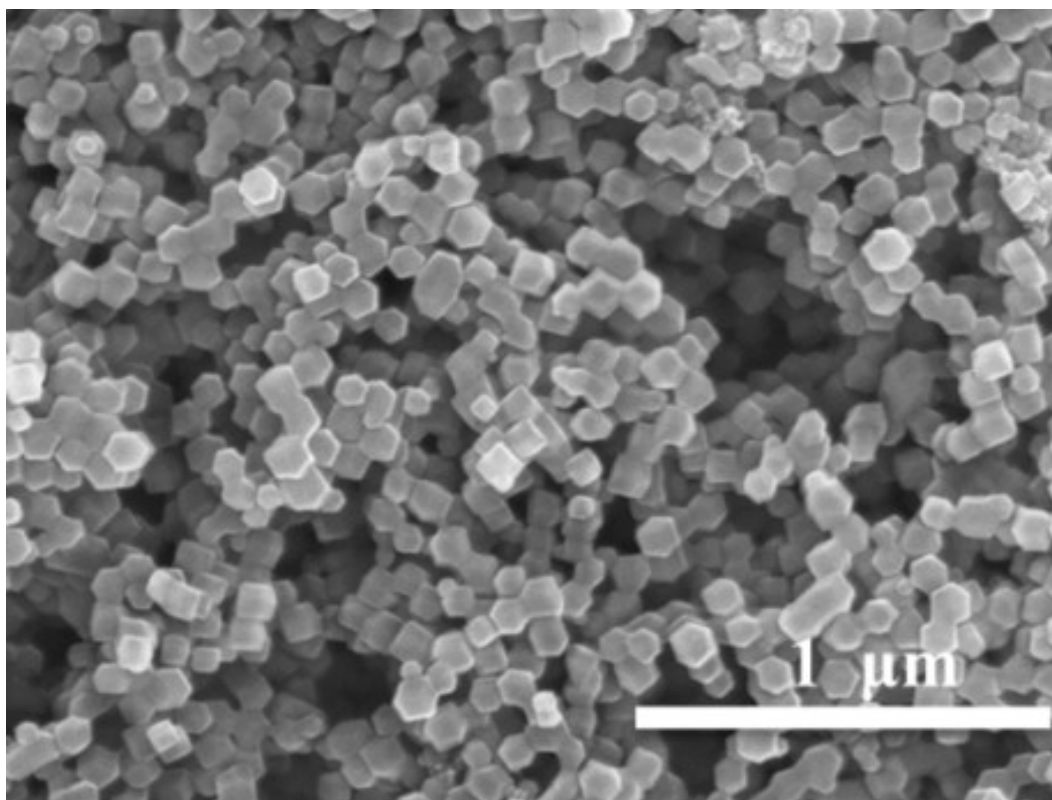
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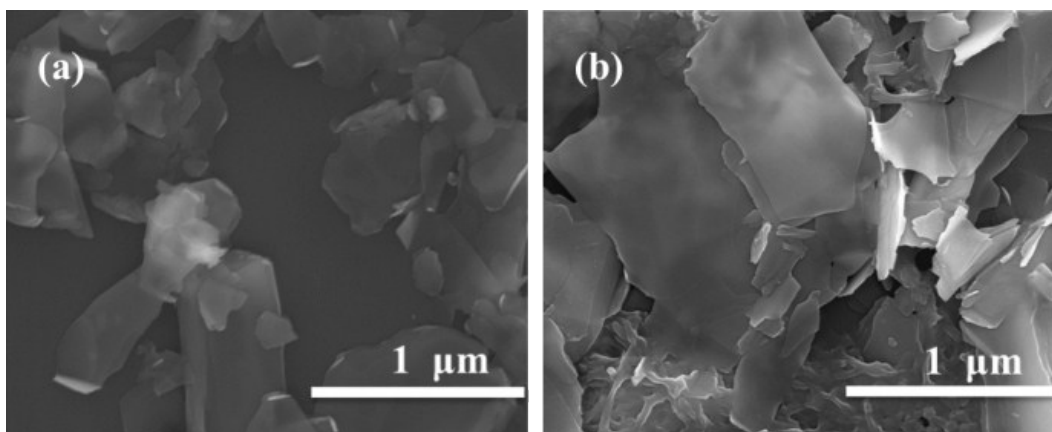
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**Figures:**



**Figure S1** SEM image of the as-synthesized ZIF-8.



**Figure S2** SEM images of (a) PVP-BP and (b) PVP-BP-Zn<sup>2+</sup>.

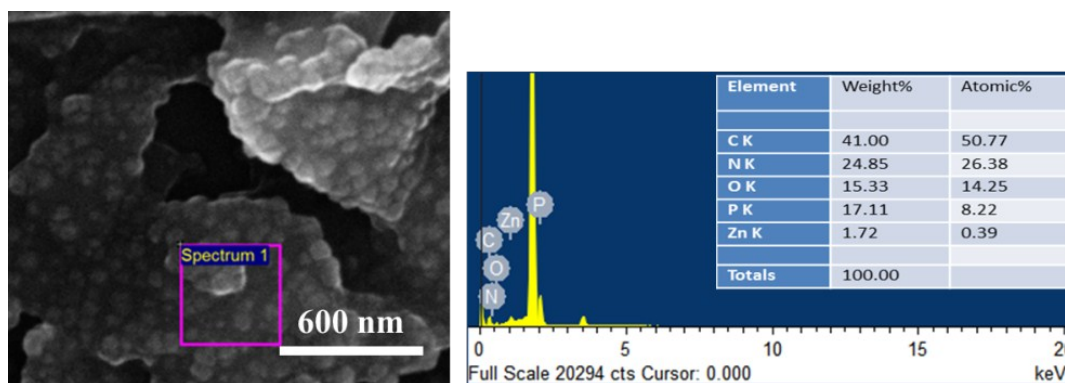


Figure S3 EDX of ZIF-8/BP.

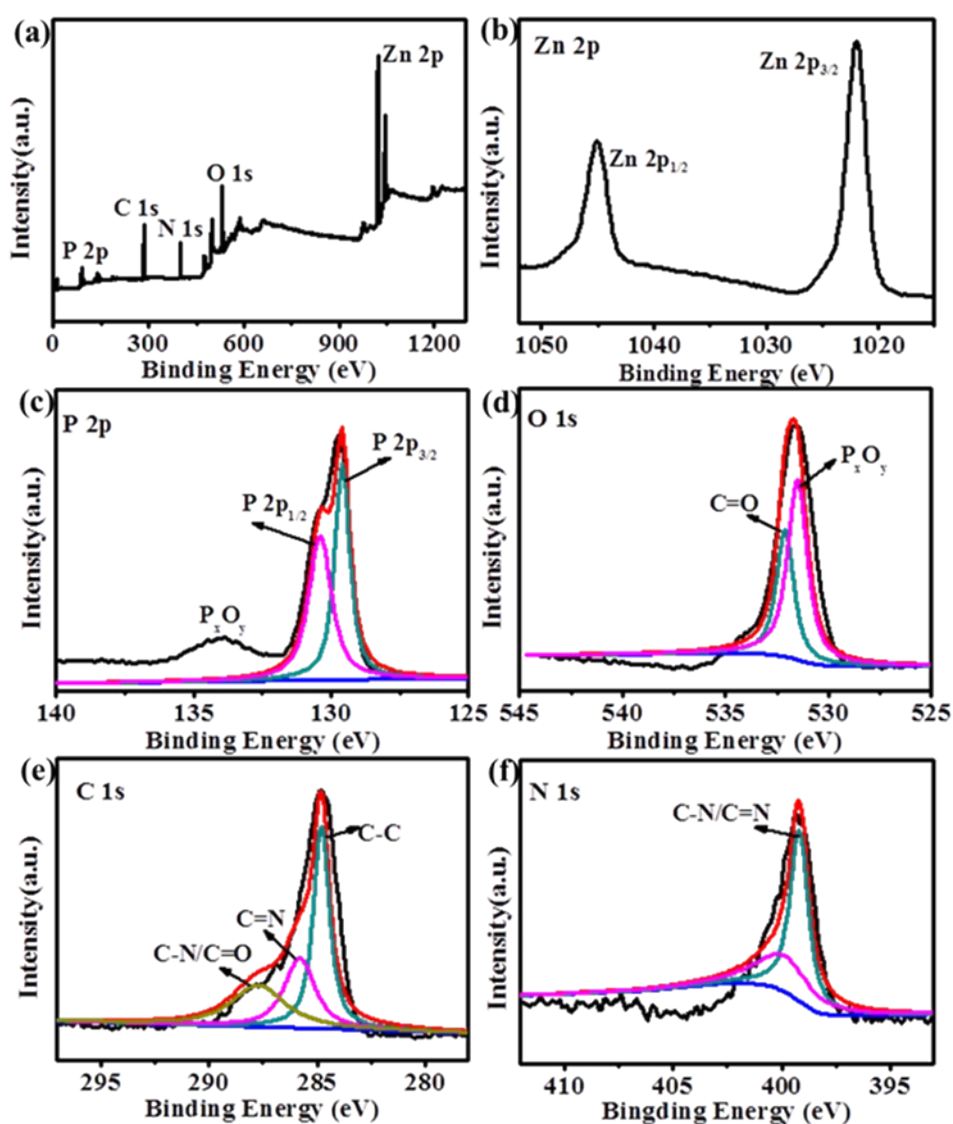
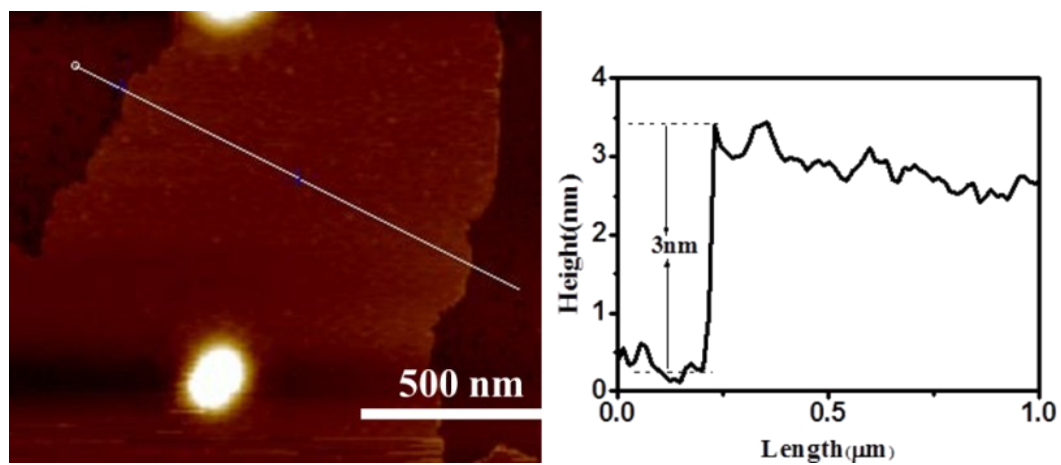
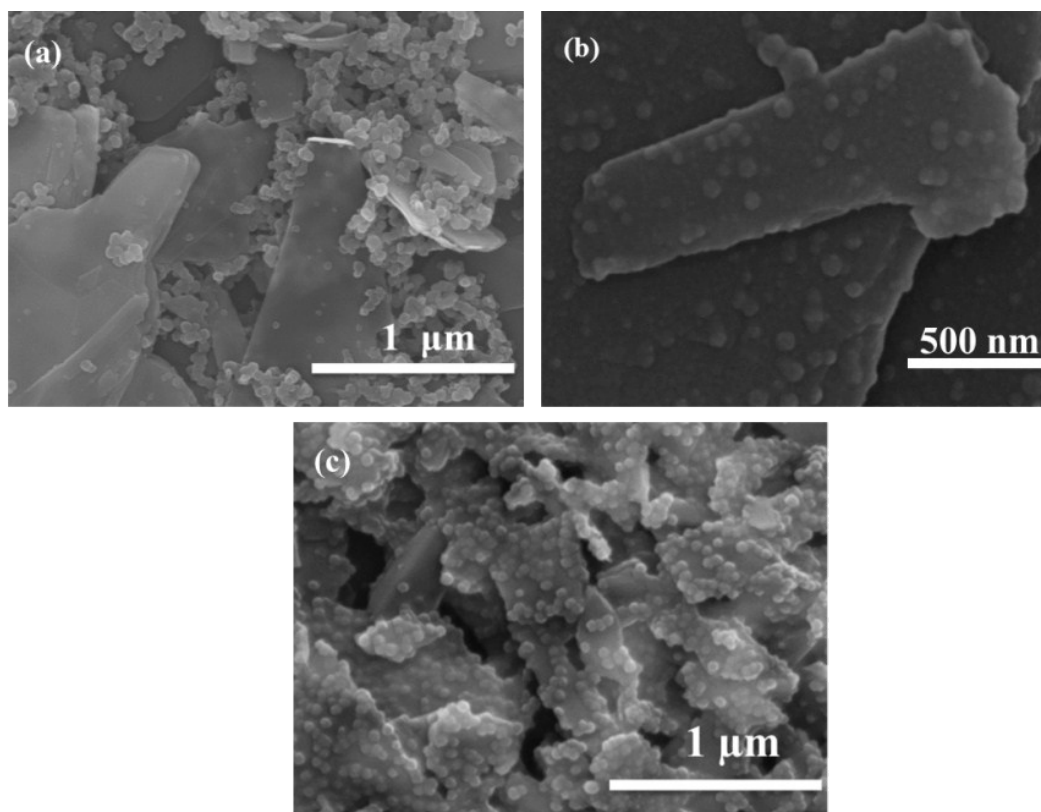


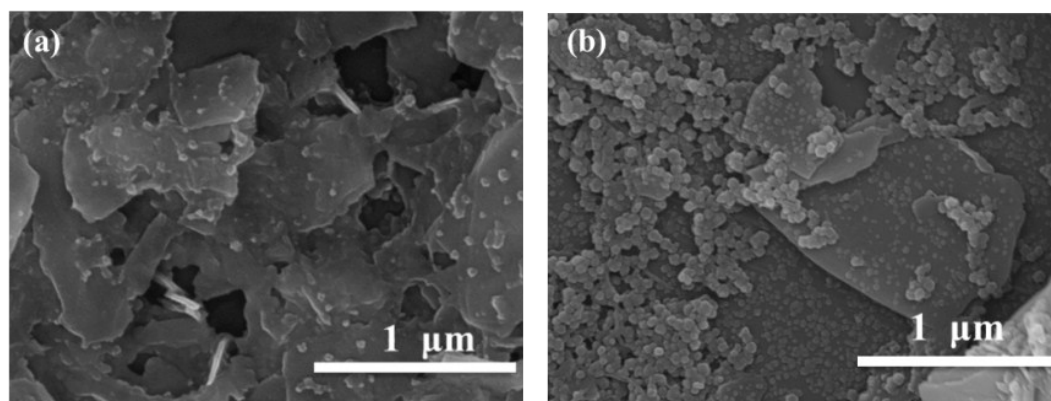
Figure S4 XPS of ZIF-8/BP.



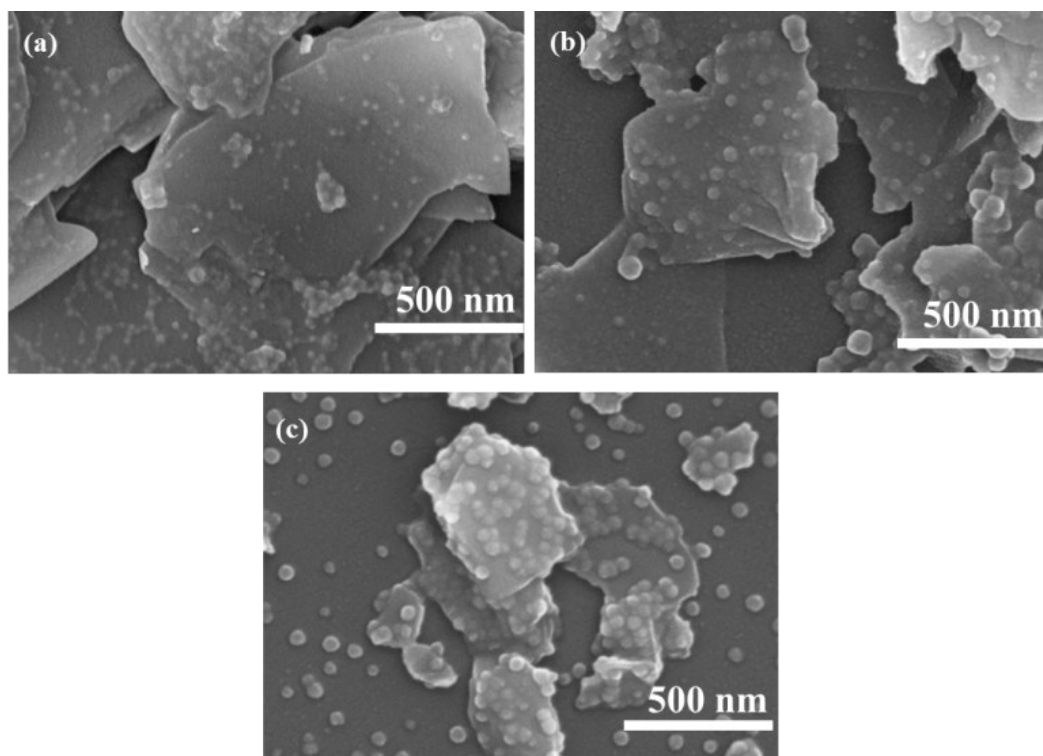
**Figure S5** AFM image of as-exfoliated FL-BP.



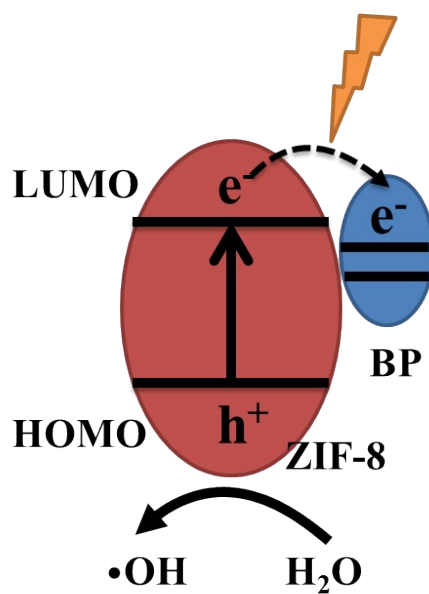
**Figure S6** SEM images of ZIF-8/BP synthesized with (a) 0 mg/mL of PVP, (b) 2 mg/mL of PVP and (c) 10 mg/mL of PVP.



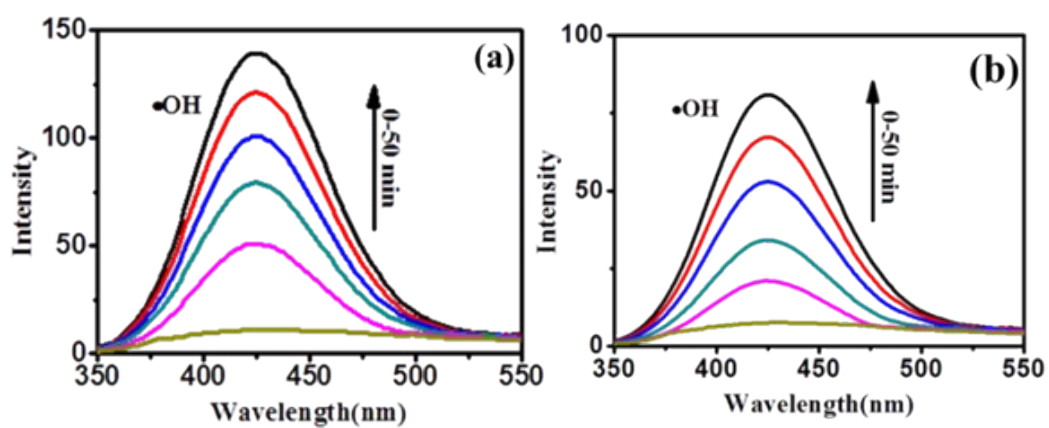
**Figure S7** SEM images of ZIF-8/BP synthesized with (a) 0.5 mg/mL  $\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$  and (b) 3 mg/mL  $\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ .



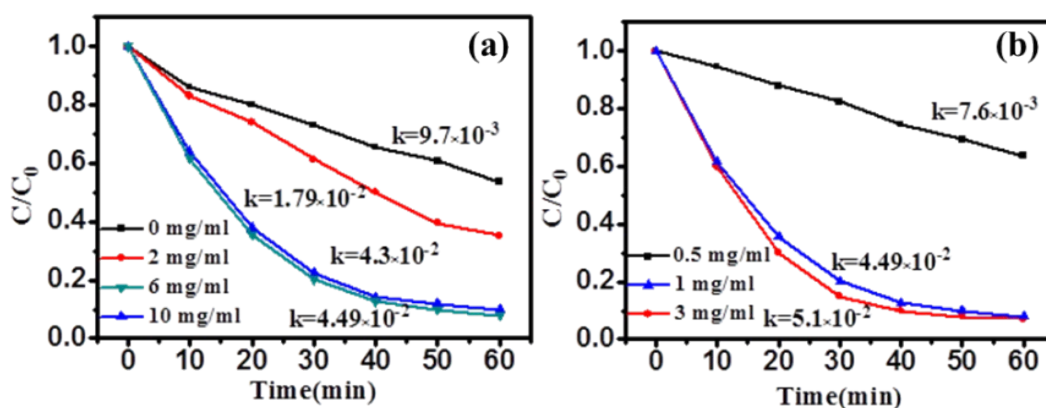
**Figure S8** SEM images of ZIF-8/BP synthesized with growth time of (a) 30 min, (b) 1 h and (c) 24 h.



**Figure S9** Schematic mechanism of enhanced charge separation and transfer for photodegradation of MB with ZIF-8/BP nanocomposites.



**Figure S10** (a) Time dependent fluorescence spectra of terephthalic acid solution ( $4 \times 10^{-4}$  M) containing (a) ZIF-8/BP, and (b) ZIF-8 (every 10min, up to 50min).



**Figure S11** (a) Degradation plot of MB with ZIF-8/BP synthesized from different amount of PVP, (b) Degradation plot of MB with ZIF-8/BP synthesized with different amount of  $Zn(NO_3)_2 \cdot 6H_2O$ .

## References

1. H. Wang, X. Yang, W. Shao, S. Chen, J. Xie, X. Zhang, J. Wang and Y. Xie, *J. Am. Chem. Soc.*, 2015, **137**, 11376-11382.
2. S. R. Venna, J. B. Jasinski and M. A. Carreon, *J. Am. Chem. Soc.*, 2010, **132**, 18030-18033.