Supplementary information for:

Preparation of a new adsorbent-supported Fe/Ni particles for removal of crystal violet and methylene blue by a heterogeneous Fenton-like reaction

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The following is included as additional **Supplementary information** for this paper.

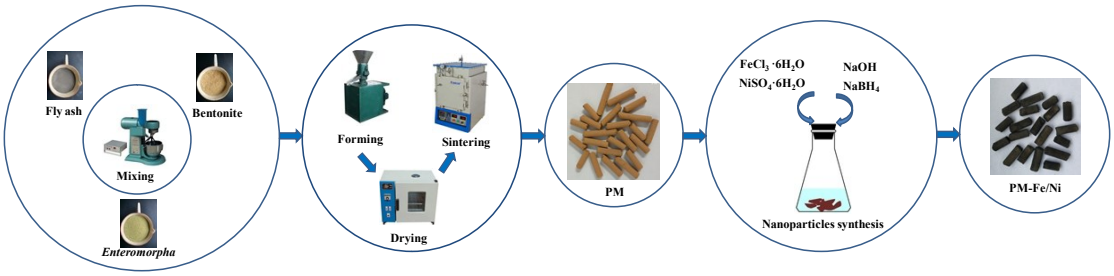
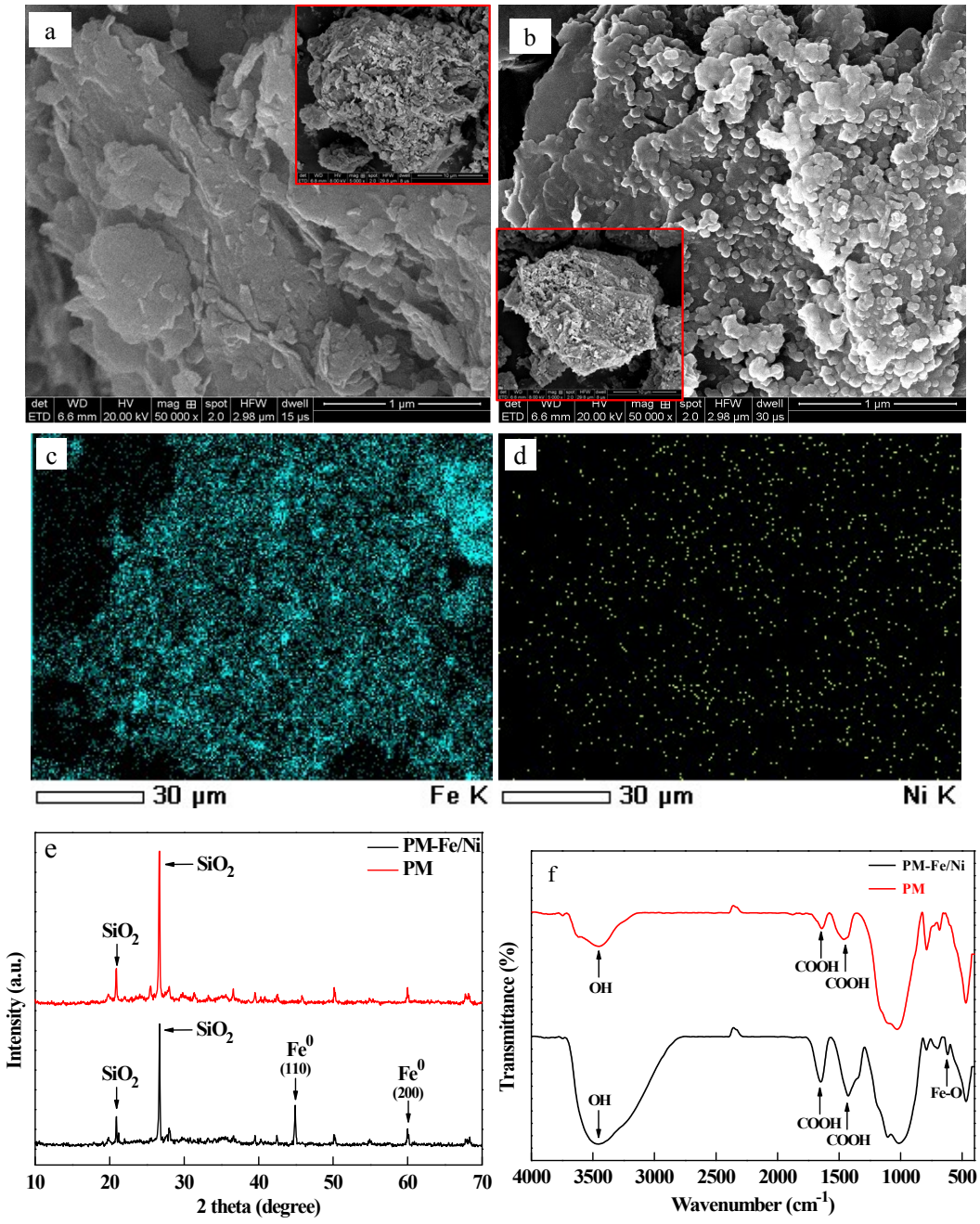


Fig. S1 Schematic diagram of PM-Fe/Ni preparation.



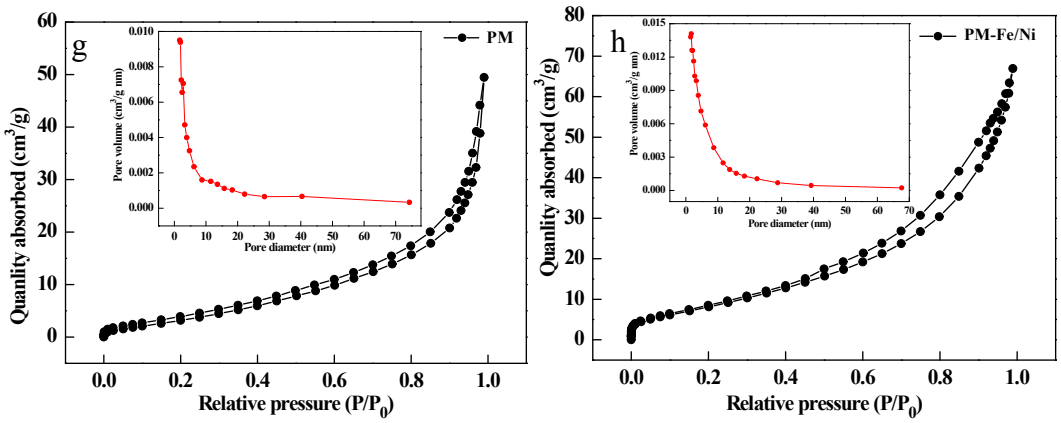


Fig. S2 SEM images of PM(a) and PM -Fe/Ni (b); Elemental mapping images of Fe (c) and Ni (d) in PM -Fe/Ni; XRD images of PM and PM -Fe/Ni (e); FTIR images of PM and PM -Fe/Ni (f); N_2 adsorption-desorption curve and pore size distribution curve of PM (g) and PM -Fe/Ni (h).

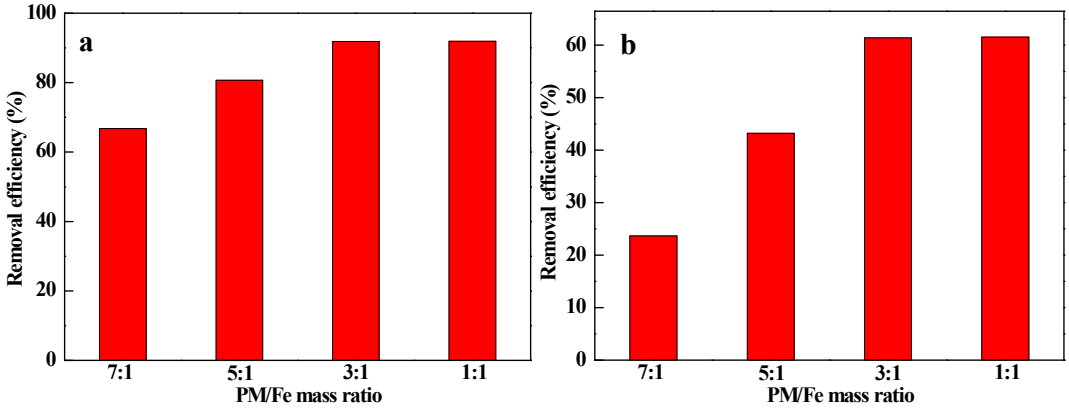
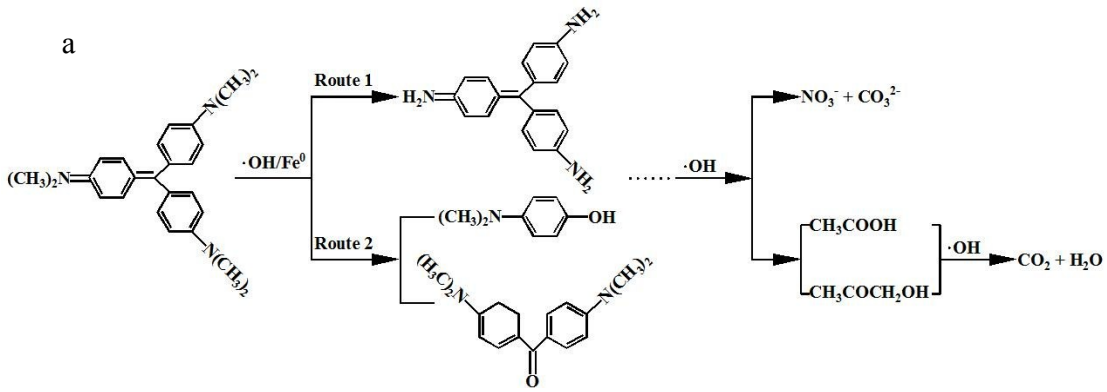


Fig. S3 The effect of PM/Fe mass ratio on the removal of CV (a) and MB (b).



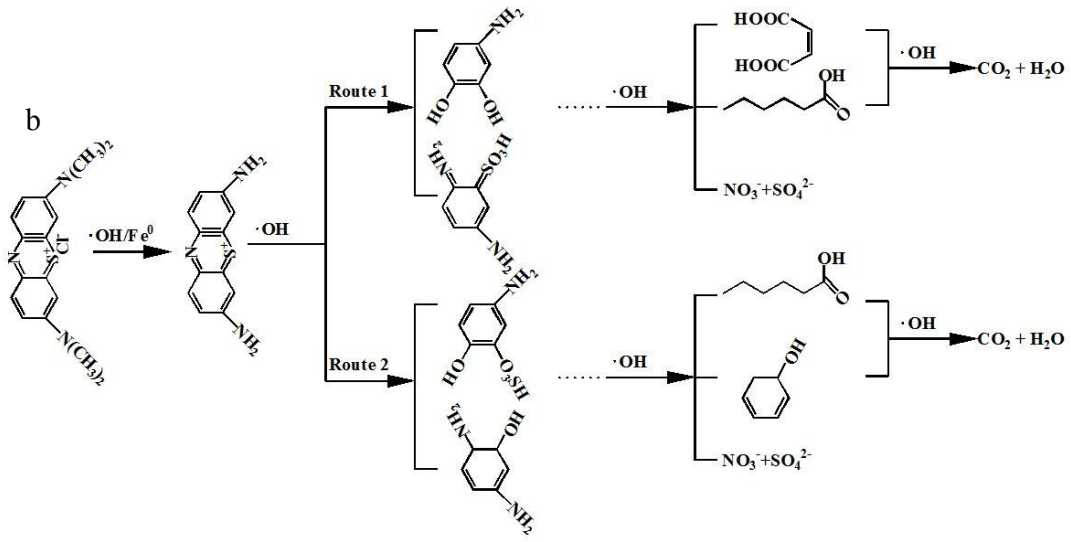


Fig. S4 Possible removal mechanism of CV (a) and MB (b) under Fenton-like processes.

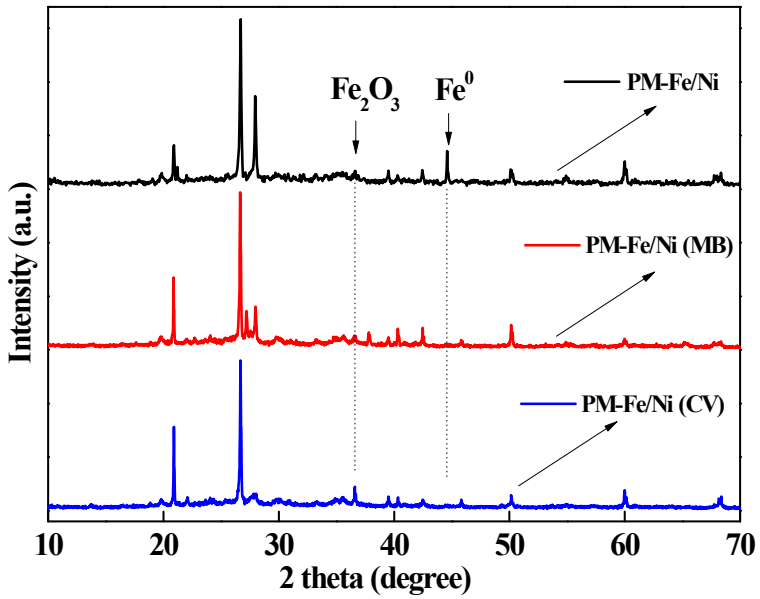


Fig. S5 XRD images of PM -Fe/Ni after CV and MB removal.

Table S1 Comparative data for the catalytic ability of various materials and PM-Fe/Ni for the removal of CV and MB.

Catalyst	Conditions	R (%)	Reference
PM-Fe/Ni	Dose: 0.2 g; H_2O_2: 50 mM; pH: 3; CV: 1000 mg/L (100 mL); 20℃	91.86	This work
MMT+Fe(II)	Dose: 3 g/L; H_2O_2: 50 mM; pH: 3; CV: 012 mM (100 mL); 25℃; Visible light: 1.5×10^{18} photos/s at 366 nm	99.91	1
$FeSO_4\cdot7H_2O$	Dose: 0.5 mM; H_2O_2: 50 mM; pH: 5; CV: 015 mM (100 mL); 25℃	97.00	2
FeGAC	Dose: 1.5 g/L; H_2O_2: 7.4 mM; pH: 3; CV: 10 mg/L (100 mL); 25℃	71.00	3
Fe/AC	Dose: 2.5 g/L; Qzone: 4.44 mg/min; 300 mL/min gas flow rate; pH: 7; CV: 400 mg/L (100 mL); 25℃	96.00	4
PM-Fe/Ni	Dose: 0.2 g; H_2O_2: 50 mM; pH: 3; MB:1000 mg/L (100 mL); 20℃	61.41	This work
Fe(II)Fe(III)-LDHs	Dose: 0.1 g/L; H_2O_2: 0.01 mm/L; pH: 4; MB: 10 mg/L (100 mL); At ambient temperature	100.00	5
Fe_3O_4/BAC	Dose: 1.2 g/L; H_2O_2: 0.23 mol/L; pH: 7; MB: 10 mg/L (100 mL); 30℃	98.00	6
MPCMS-500	Dose: 2 g/L; H_2O_2: 16 mmol/L; NH_2OH: 4 mM; pH: 5; MB: 40 mg/L(10 mL); 30℃	98.00	7
PMS-Fe-380	Dose: 1 g/L; H_2O_2: 1 g/L; pH: 4; MB: 50 mg/L (100 mL); 30℃	94.20	8

References

1. L. Guz, G. Curutchet, R. M. T. Sánchez and R. Candal, *J. Environ. Chem. Eng.,* 2014, **2**, 2344-2351.
2. H. J. Fan, S. T. Huang, W. H. Chung, J.L. Jan, W. Y. Lin and C .C. Che, *J. Hazard. Mater.*, 2009, **171**, 1032–1044.
3. C. C. Chen, W. C. Chen, M. R. Chiou, S. W. Chen, Y. Y. Chen and H. J. Fan, *J. Hazard. Mater.*, 2011, **196**, 420-425.
4. J. Wu, Hong Gao, S. Yao, L. Chen, Y. W. Gao and H. Zhang, *Sep. Purif. Technol.*, 2015, **147**, 179-185.
5. Q. Wang, S. L. Tian , J. Long and P. Ning, *Catal. Today*, 2014, **224**, 41–48.

6. X. Liu, S. X. Zhang, H. Luo, Y. Y. Zhang, Q. Xu, Z. Y. Zhang , H. Xu and Z. H. Wan, *J. Taiwan Inst. Chem. E.*, 2017, **81**, 265–274.

7. L. C. Zhou, Y. M. Shao, J. R. Liu, Z. F. Ye, H. Zhang, J. J. Ma, Y. Jia, W. J. Gao and Y. F. Li, *ACS Appl. Mater. Interfaces*, 2014, **6**, 7275-7285.

8. G. Q. Zhou, Z. W. Chen, F. Fang, Y. F. He, H. L. Sun and H. X. Shi, *J. Environ. Sci.*, 2015, **35**, 20-26.