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# Supplementary information

## Prussian blue analogues derived porous nitrogen-doped carbon microspheres as high-performance metal-free peroxymonosulfate activators for non-radical-dominated degradation of organic pollutants

Na Wang, Wenjie Ma, Ziqiu Ren, Yunchen Du*, Ping Xu and Xijiang Han*

MIIT Key Laboratory of Critical Materials Technology for New Energy Conversion and Storage, School of Chemistry and Chemical Engineering, Harbin Institute of Technology, Harbin 150001, China

*Corresponding authors. E-mail: yunchendu@hit.edu.cn; hanxijiang@hit.edu.cn.

Tel: +86-(451)-86418750; fax: +86-(451)-86413702.

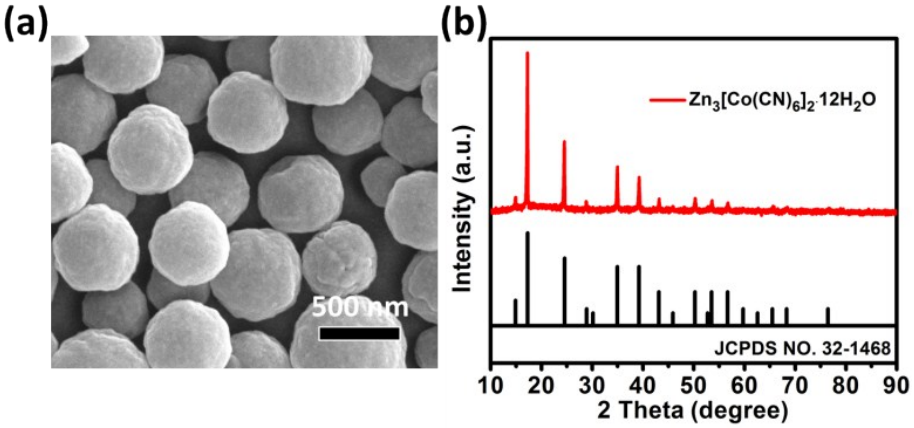



**Figure S1.** SEM and XRD pattern of $Zn_3[Co(CN)_6]_2 \cdot 12H_2O$ microspheres.

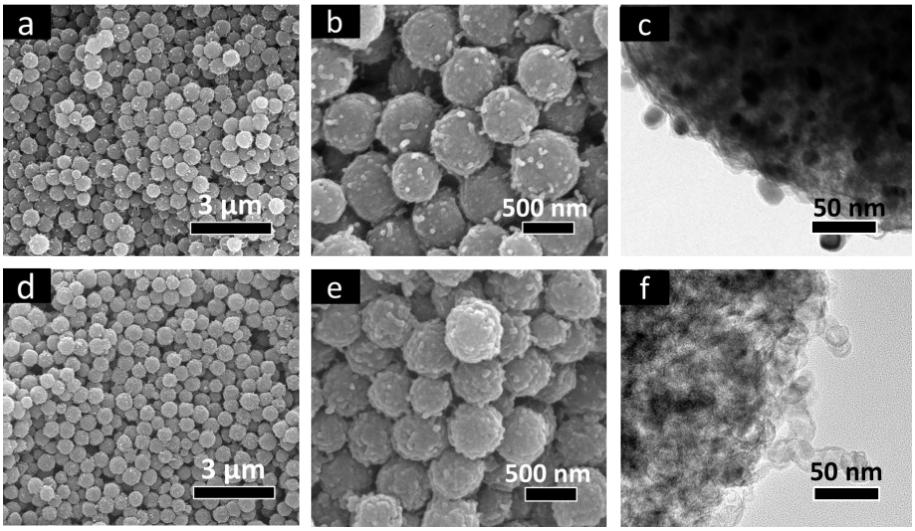



**Figure S2.** SEM and TEM images of metal carbide/carbon hybrid microspheres before (a-c) and after (d-f) acid etching.

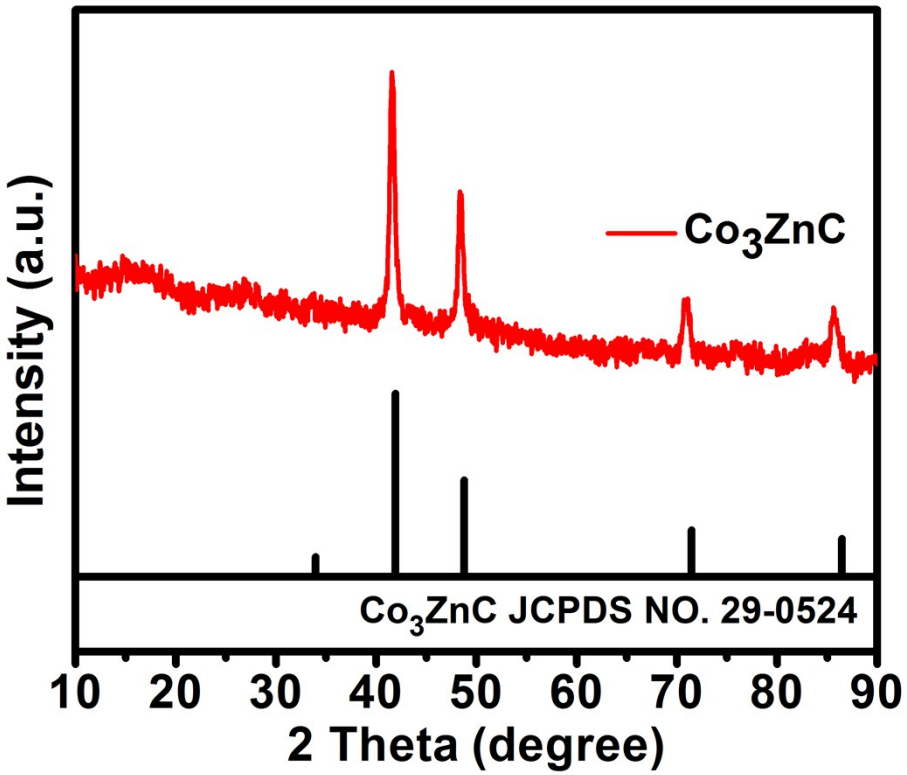



**Figure S3.** XRD pattern of metal carbide/carbon hybrid nanocomposite.

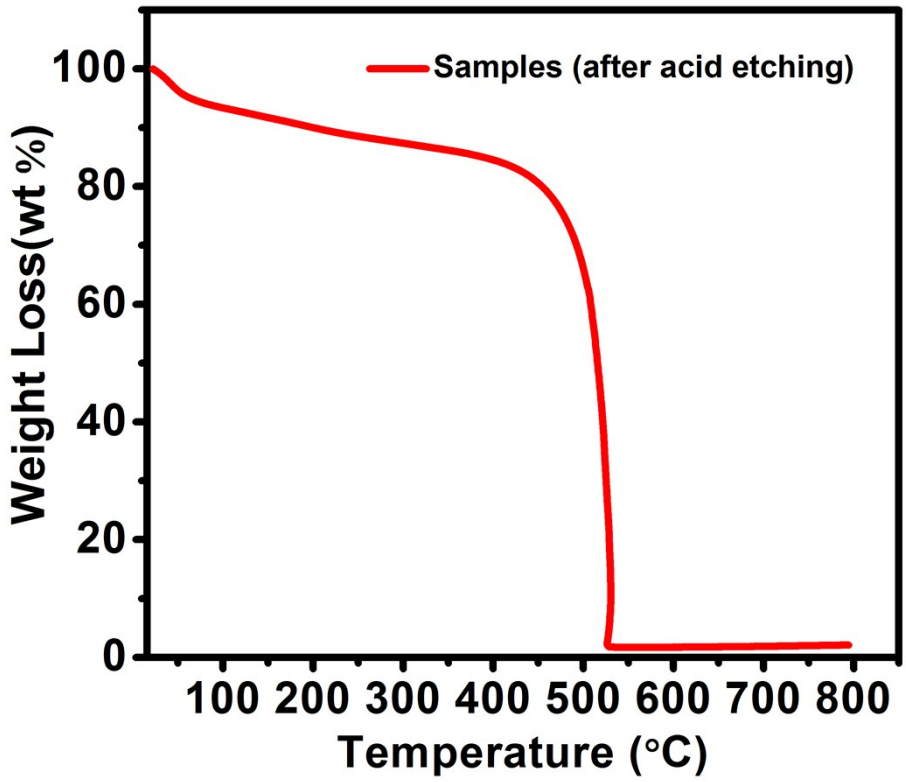



**Figure S4.** TG curve of metal carbide/carbon hybrid microspheres after acid etching under air atmosphere.

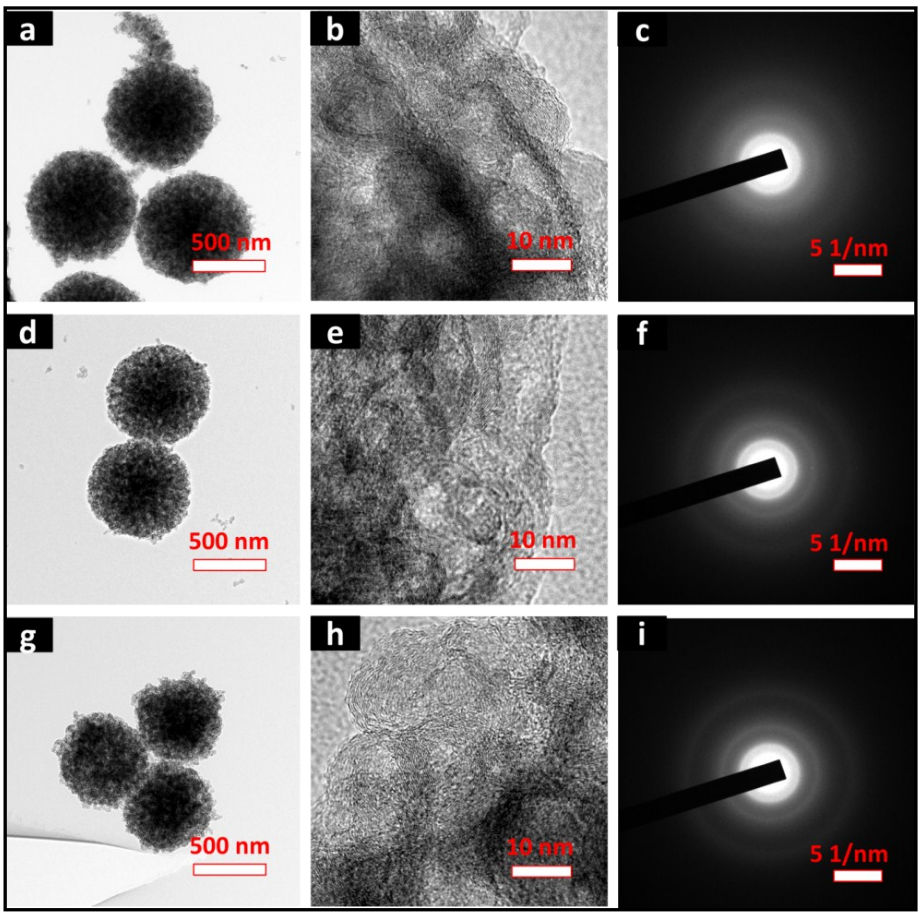



**Figure S5.** TEM, HRTEM and SAED patterns of PNC-600 (a-c), PNC-700 (d-f), and PNC-900 (g-i).

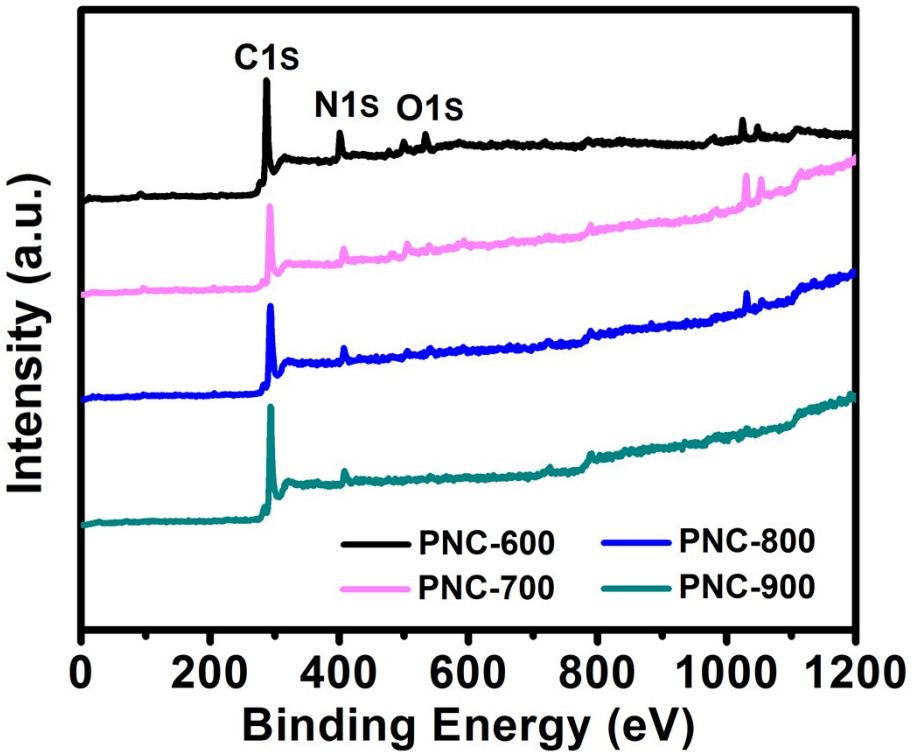
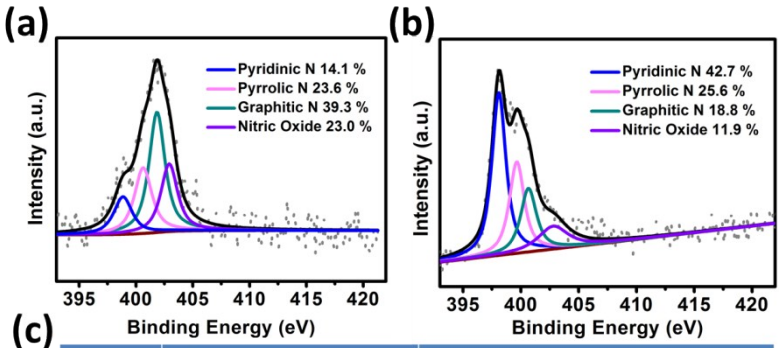



**Figure S6.** XPS survey of PNC-X microspheres.




(c)

| Samples | XPS(at.%) | | | Proportion of total N 1s | | | |
|---|---|---|---|---|---|---|---|
| | C | N | O | Pyridinic N | Pyrrolic N | Graphitic N | Nitric Oxide |
| PNC-800 | 86.3 | 10.5 | 1.6 | 30.4 | 27.8 | 29.9 | 11.9 |
| HNC-67 | 85.8 | 3.99 | 8.86 | 14.1 | 23.6 | 39.3 | 23.0 |
| HNC-8 | 52.9 | 14.6 | 26.3 | 42.7 | 25.6 | 18.8 | 11.9 |

**Figure S7.** High-resolution N 1s XPS spectra of HNC-67 (a) and HNC-8 (b), and the parameters of XPS spectra and the fitting results of N 1s peaks of PNC-800, HNC-67 and HNC-8 (c).

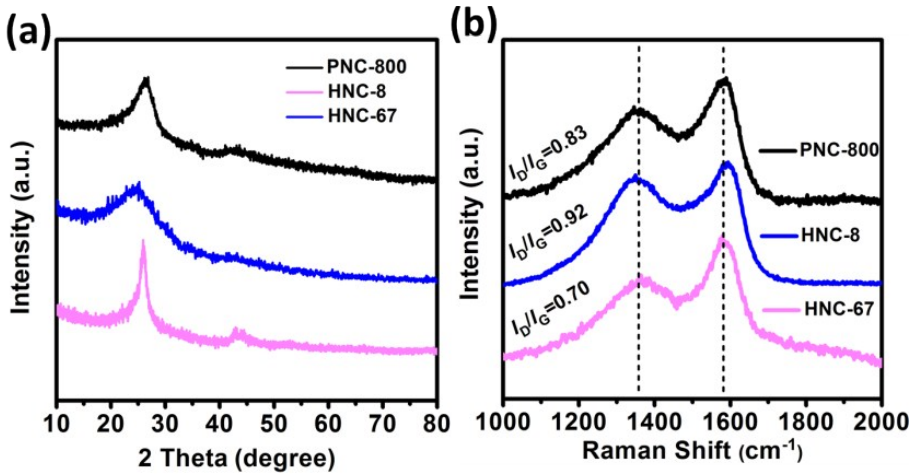



**Figure S8.** XRD and Raman spectra of PNC-800, HNC-8 and HNC-67.

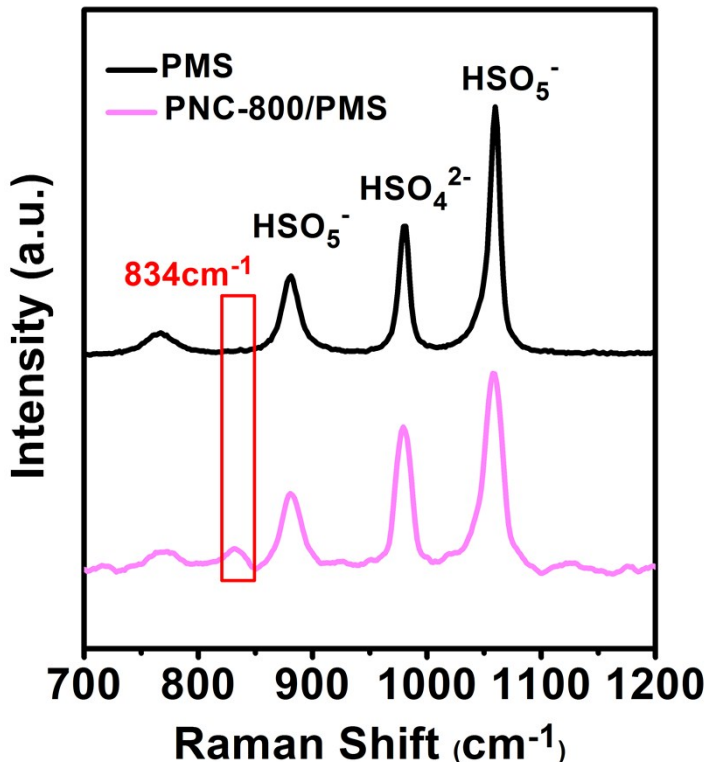



**Figure S9.** Raman spectra of PMS solution and PNC-800 in PMS solution.

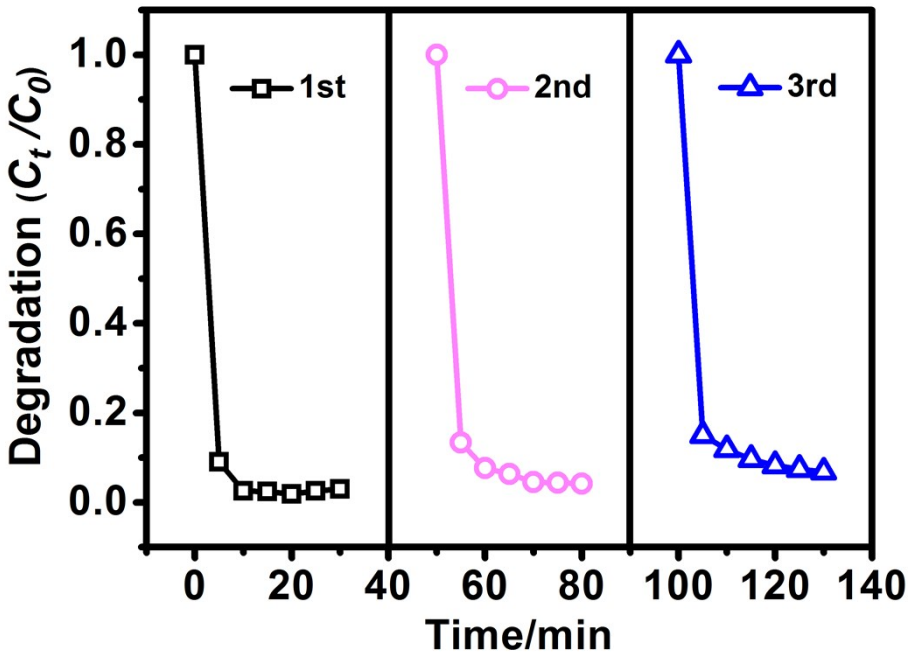



**Figure S10.** Stability and regeneration tests of PNC-800. Reaction conditions: [MB]=100 mg $L^{-1}$, [Oxone]=1.0 g/L, catalyst=0.1 g $L^{-1}$, T=25 $^{o}$C, pH=6.30.