

**Polymer-Metal organic framework Core-Shell framework Nanofibers via
electrospinning and Their gas adsorption Activity**

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The infrared spectrum of ZIF-8 nanocrystal and the core-shell PAN@ZIF-8 nanofibers. Most of the spectra are related to the vibrations of the methylimidazole units and thus can be described based on the origin of the bonds. It was observed that the spectra of the samples are in good agreement with other studies^[1,2]. The absorption bands between 3135 and 2929 cm^{-1} can be attributed to the aromatic and the aliphatic C-H stretching of methylimidazole, respectively. The characteristic peak at 1584 cm^{-1} was due to the C=N stretching mode, whereas bands between 1350–1500 cm^{-1} can be assigned to the entire ring stretching. The peak at 450 cm^{-1} shows the distinct stretching vibration of Zn-N^[3]. In the figure s1, the characteristic peak at 2243 cm^{-1} was nitrile grouping C≡N stretching vibration, the characteristic peak which

is match with ZIF-8, which indicate ZIF-8 nanocrystals successful fabricated on the PAN fiber.

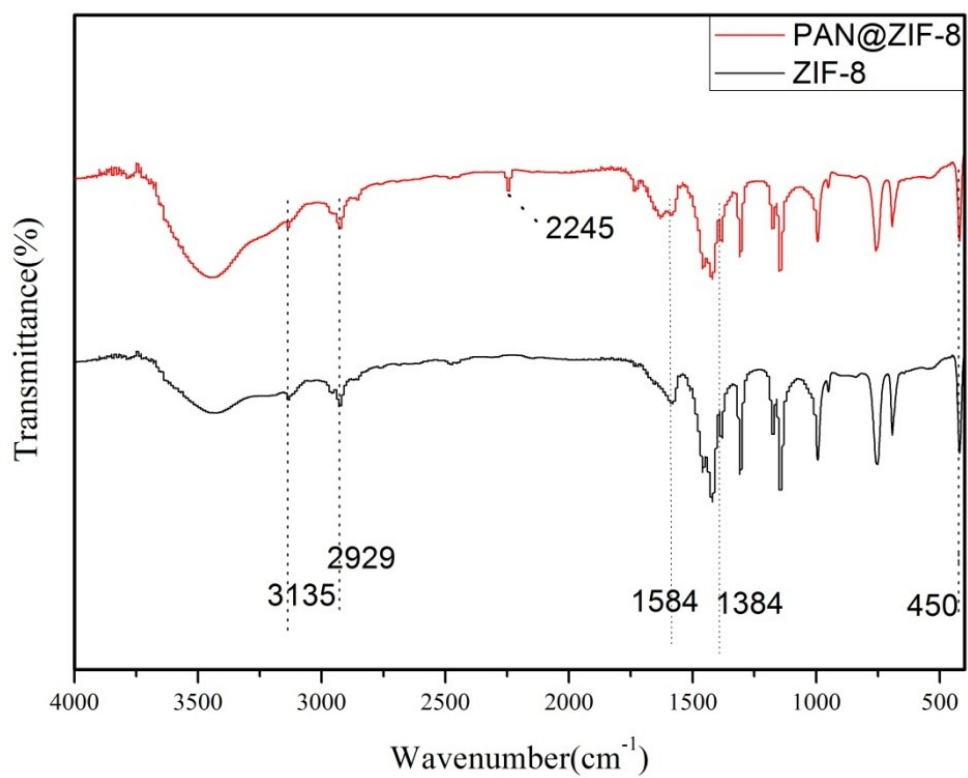


Figure S1: the FTIR spectra of samples pure ZIF-8 and PAN@ZIF-8.

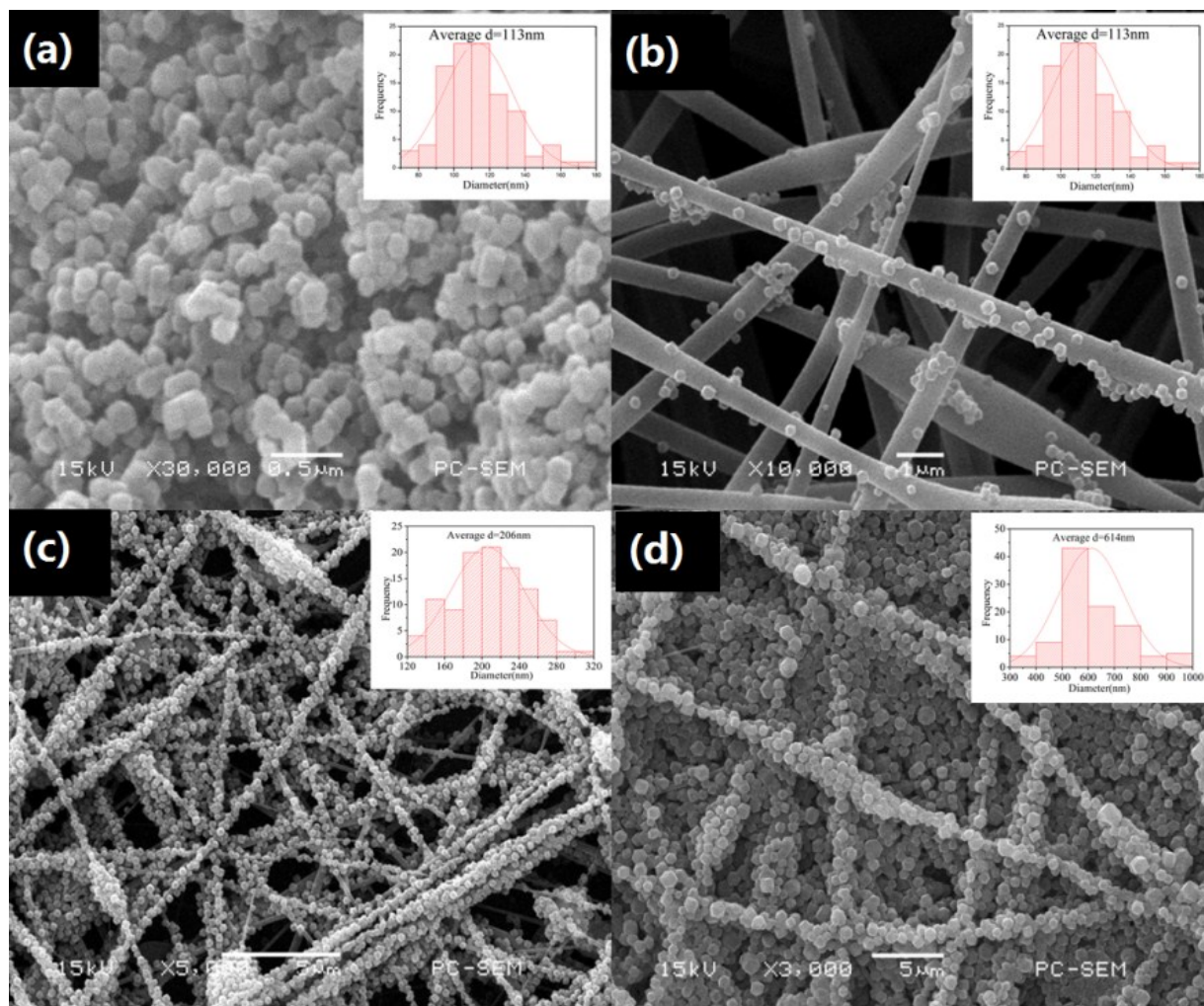


Figure S2: Morphology and size of the Core-Shell PAN@ZIF-8 nanofibers.

The morphologies of the core-shell PAN@ZIF-8 nanofibers were further investigated by TEM. The representative TEM images given in Figure S3 clearly showed that ZIF-8 nanocrystal on the PAN nanofibers have core-shell structure. It is evident that the ZIF-8 shell layer possess of uniform thickness on the PAN fibers surface. The TEM images also revealed that the thickness of the ZIF-8 shell layer was about 80nm for each core-shell PAN@ZIF-8nanofiber.

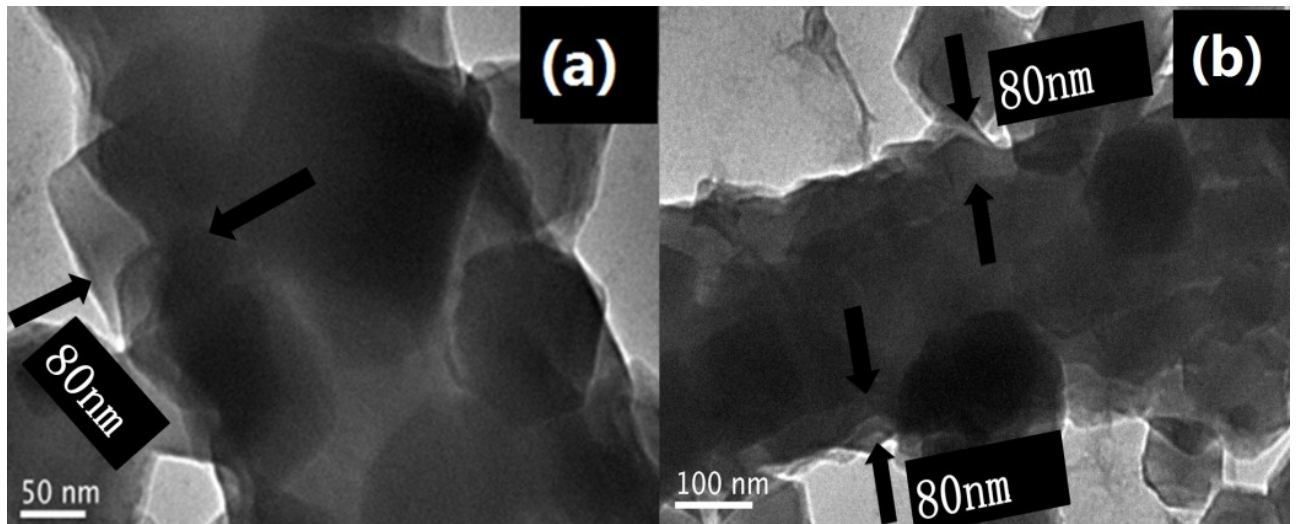


Figure S3: Transmission electron microscopy (TEM) characterization.

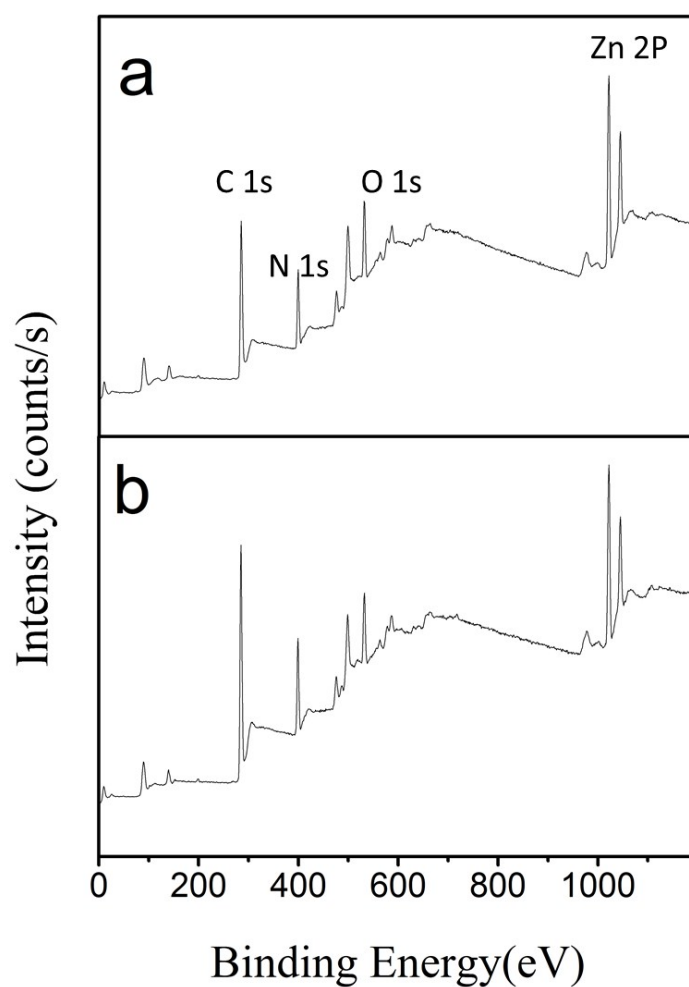


Figure S4: XPS survey spectrum of the PAN@ZIF-8 core-shell nanofibers (a) and ZIF-8 (b).

Supporting References

- [1] K. S. Park, Z. Ni, A. P. Cote, J. Y. Choi, R. Huang, F. J. Uribe-Romo, H. K. Chae, M. O'Keeffe and O. M. Yaghi, Exceptional chemical and thermal stability of zeolitic imidazolate frameworks, *Proc. Natl. Acad. Sci. U. S. A.* 2006, 103: 10186–10191.

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