Supporting Information

Photoelectric and Flexible poly (styrene-b-ethylene/butylene-b-styrene)-Zinc porphyrin- graphene hybrid composite: synthesis, performance, and mechanism

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1. XPS Characterization of Graphene

Fig. S1 XPS spectra of Graphene

Table S1 Element contents of Graphene calculated based on the XPS spectra in Fig. s1

| Sample   | Element content/% |
|----------|-------------------|
|          | C                  |
|          | O                  |
| Graphene | 96.31%             |
|          | 3.69%              |

A typical XPS spectrum shows that mechanically exfoliated graphene is composed of 96.31% carbon and 3.69% oxygen and does not contain any heteroatoms.
2. Raman Characterization of Graphene

A typical Raman spectrum shows the sheet structure of graphene and without much defects.  

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Fig. S2 Raman spectra of Graphene
3. **Porphyrinization degree**

Porphyrinization degree is calculated by the equation below:

\[
G = \frac{5S_{NH}}{S_{NH} + 2S_{benzene}}
\]

![Fig. S3 $^1$H-NMR spectra of Zn-PorSEBS I](image-url)
Fig. S4 $^1$H-NMR spectra of Zn-PorSEBS II
Fig. S5 $^1$H-NMR spectra of Zn-PorSEBS III

Table S2 Summary of chloromethylation degree of Zn-PorSEBS

| Samples       | Zn-PorSEBS I | Zn-PorSEBS II | Zn-PorSEBS III |
|---------------|--------------|---------------|----------------|
| Chloromethylation degree (%) | 7.2%         | 10.9%         | 13.6%          |

References:

1. E. J. Heller, Y. Yang, L. Kocia, W. Chen, S. Fang, M. Borunda and E. Kaxiras, *Acs Nano*, 2016, **10**, 2803-2818.