***Electronic Supplementary Information***

**High-efficiency electrodeposition of polyindole nanocomposite using MoS2 nanosheets as electrolytes and their capacitive performance**

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***Calculation of the specific capacitance***

According to the literature, it is more appropriate to use the area specific capacitance to characterize the electrode material capacity than mass specific capacitance (Horng et al., 2010; Liu et al., 2012). Therefore, the area specific capacitance was calculated from CV (Eq. 1) and GCD (Eq. 2):

(1)

(2)

where is the area capacitance (mF cm-2), is the integrated area of the CV curve, is the surface area of active materials in the single electrode (cm2), is the potential window (V), is the scan rate (mV s-1), *I* is the current density (A), and is the discharge time (s).

***Calculation of the effective surface areas***

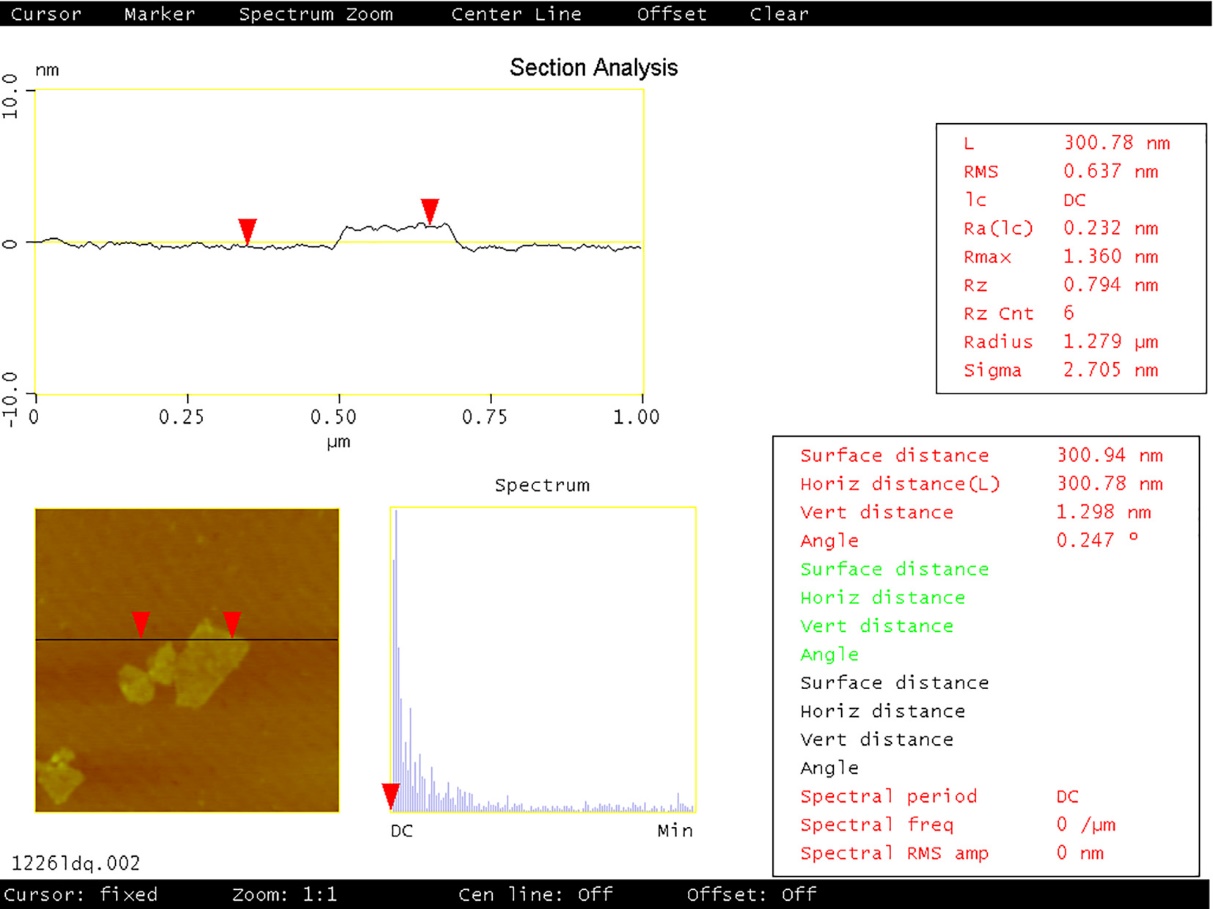
The effective surface areas of PIn and PIn/MoS2 electrodes were tested by CV with 5 mM K3Fe(CN)6 as a probe at different scan rates (T = 298 K). For a reversible process, the following Eq. 3 applies (Wang et al., 2007; Yang et al., 2009):

*i*p = 2.69 × 105 *An*3/2*DR*1/2*C*o*v*1/2 (3)

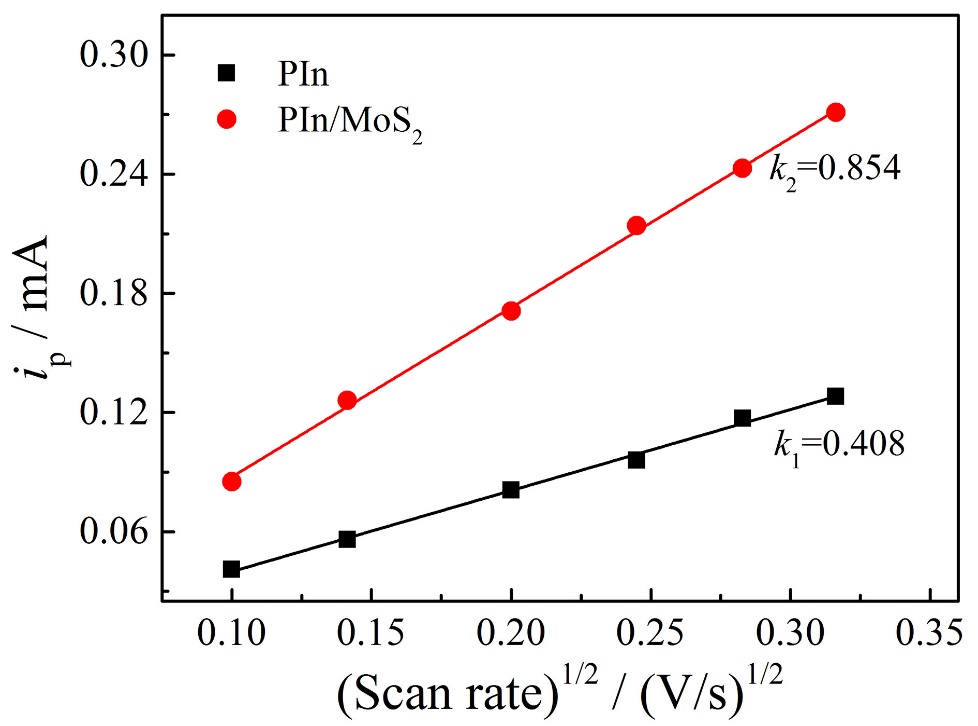
where *i*p refers to the peak current (A) and A is the electrode area (cm2). For 5 mM K3Fe(CN)6, n = 1, DR = 7.6 × 10-6 cm2 s-1 (0.1 M KCl), *C*o is the concentration of K3Fe(CN)6 (M), *v* is the scan rate (V s-1), then the effective surface areas was calculated from the slope (*k*) of the *i*p versus *v*1/2 plot (Fig. S3) to be 0.11 cm2 for PIn electrode and 0.23 cm2 for PIn/MoS2 electrode.



**Fig. S1** Digital photo of MoS2 ACN solution.



**Fig. S2** AFM images and corresponding data of exfoliated MoS2.



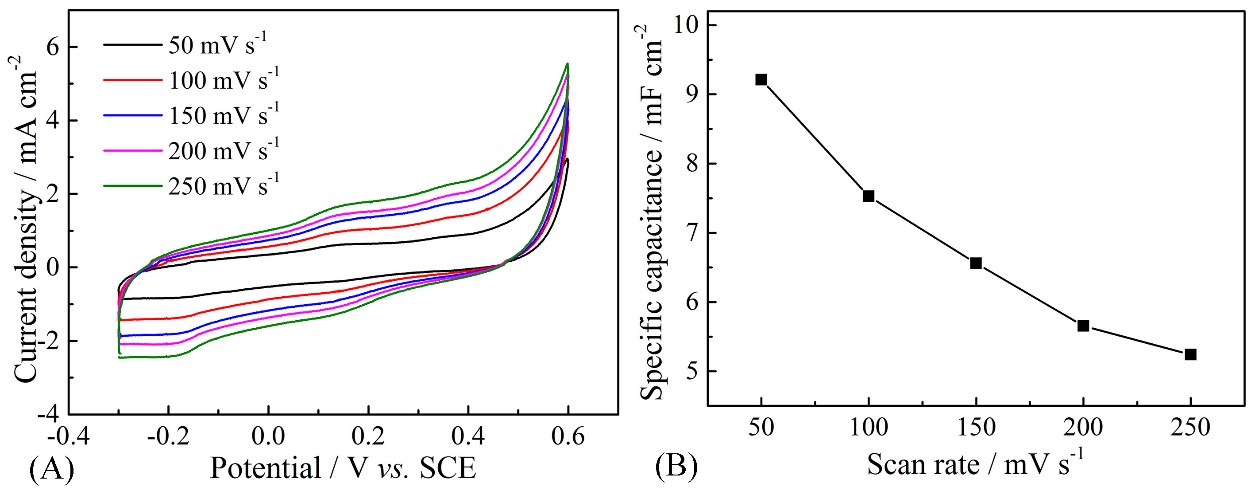
**Fig. S3** The peak current of PIn and PIn/MoS2 electrodes in 5 mM K3Fe(CN)6 containing 0.1 M KCl as a function of the square root of scan rates.

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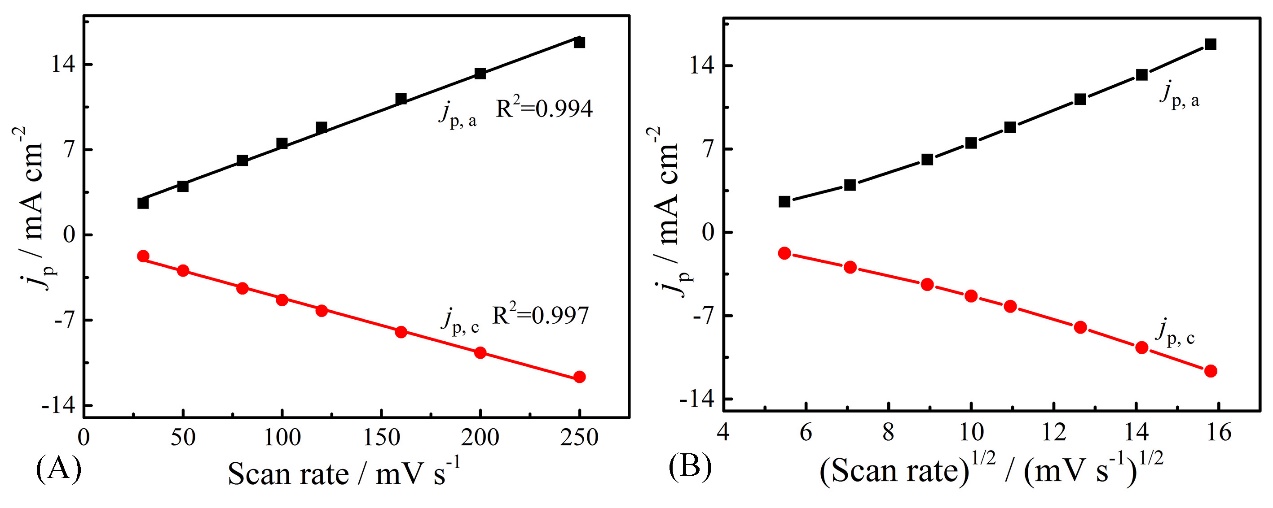
**Fig. S4** EDX spectral of PIn/MoS2.



**Fig. S5** Survey scan X-ray photoelectron spectrum of PIn/MoS2.



**Fig. S6** The CVs of MoS2 at different scan rates (A) and the specific capacitance as a function scan rate (B).



**Fig. S7** The peak current densities of PIn/MoS2 as a function of scan rates (A) and square root of scan rates (B), respectively. *j*p, *j*p,a, *j*p,c are deﬁned as the peak current densities, the anodic peak current densities at about 0.5 V, and the cathodic peak current densities at about 0.4 V, respectively.

**References**

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