Supporting Information

Nanostructured conductive polypyrrole hydrogels as high-performance, flexible supercapacitor electrodes

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1. Raman spectra of PPy hydrogel

The chemical structure of PPy hydrogel was analyzed by Raman spectra (Fig. S1) excited at 514 nm. The most important peak is the one at ca.1588.7cm^{-1}, which represents the backbone stretching mode of C=C bonds. The double peaks at ca. 1319.1 and 1394.6 cm^{-1} can be attributed to be the ring stretching mode of PPy. The peak at 1056.7 cm-1 is assigned to be the C-H in-plane deformation. The peaks at ca. 930.6 and 971.1 cm^{-1} are assigned to the ring deformation associated with dication (dipolaron) and radical cation (polaron), respectively[1].

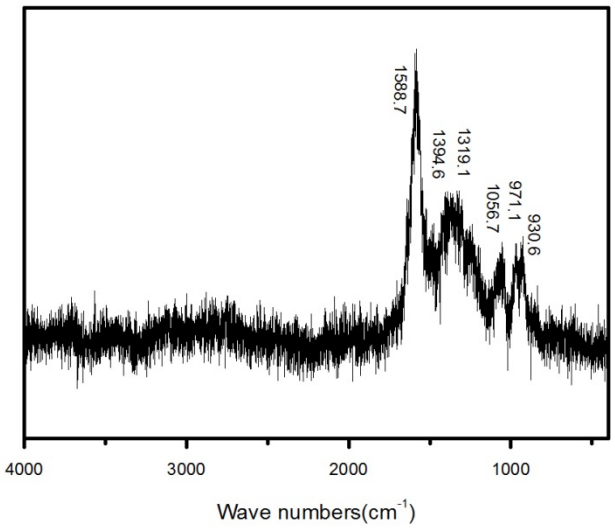

Figure S1. Raman spectra of PPy hydrogel.

1. F. Chen, G. Q. Shi, M. X. Fu, L. T. Qu and X. Y. Hong, *Synthetic Metals*, 2003, **132**, 125-132.

2. Volumetric capacitance versus current density for PPy electrode with active materials loading of 1.8 mg/cm^2

The density of our PPy hydrogel is estimated to be ~0.46 g/cm^3. Based on the density, the volumetric capacitance versus current density of PPy electrode with mass loading of 1.8 mg/cm^2 was calculated and showed in Fig. S2. Volumetric capacitance as high as 160 F/cm^3 could be achieved at low current density ~0.2 A/g and can be maintained above 120 F/cm^3 at high current density.

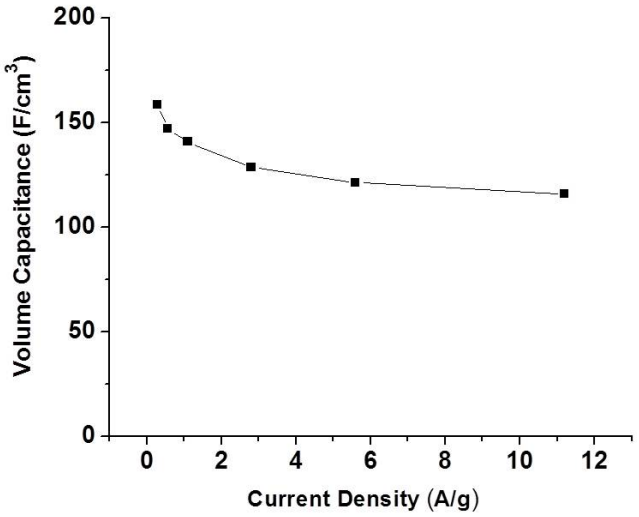

Figure S2. Volumetric capacitance versus current density for PPy electrode with active material loading of 1.8 mg/cm^2.