Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Supporting Information

Polypyrrole nanofiber-carbon nanotube electrodes for supercapacitors with high mass loading obtained using organic dye as a co-dispersant

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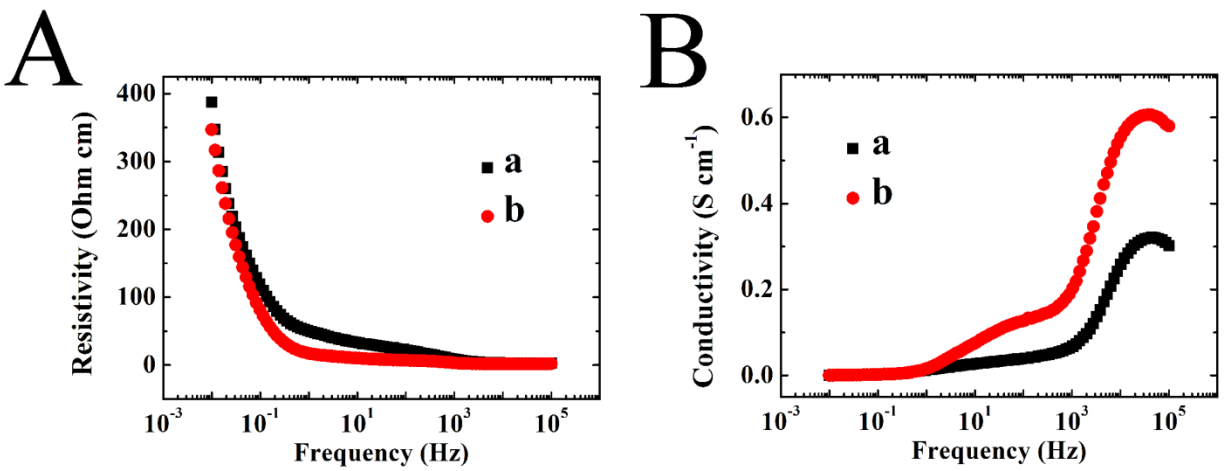

Fig. S1 (A) Resistivity and (B) conductivity of 0.5 mg cm^{-2} MWCNT films versus frequency, obtained from the impedance spectroscopy data in 0.5 M Na_2SO_4 electrolyte. The films were prepared by casting from MWCNT suspensions in ethanol (a) without and (b) with MG dispersant

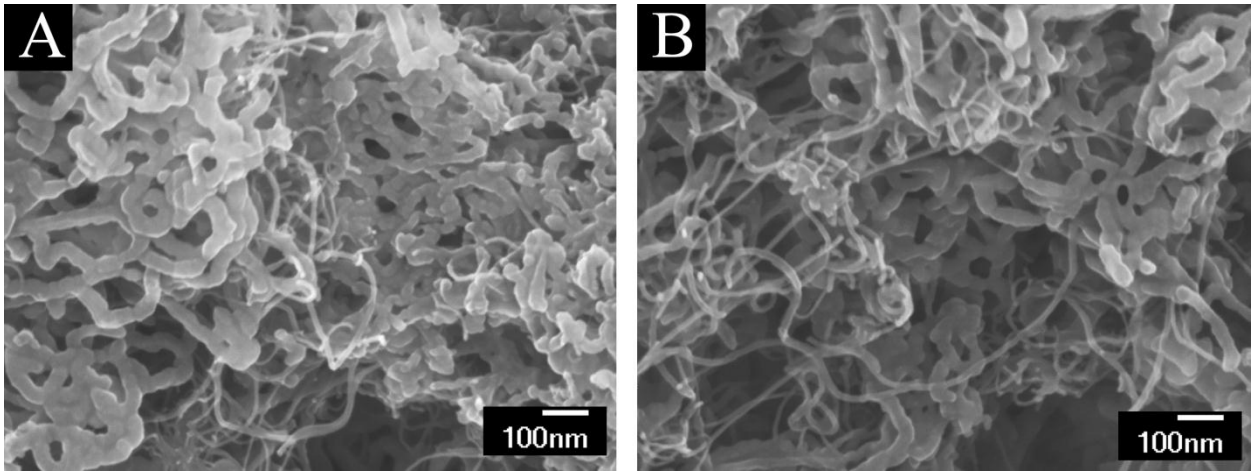

Fig. S2 SEM images of composite obtained from mixed MG dispersed PPy nanofiber - MWCNT suspension containing (A) 20, (B) 30 wt.% MWCNT.

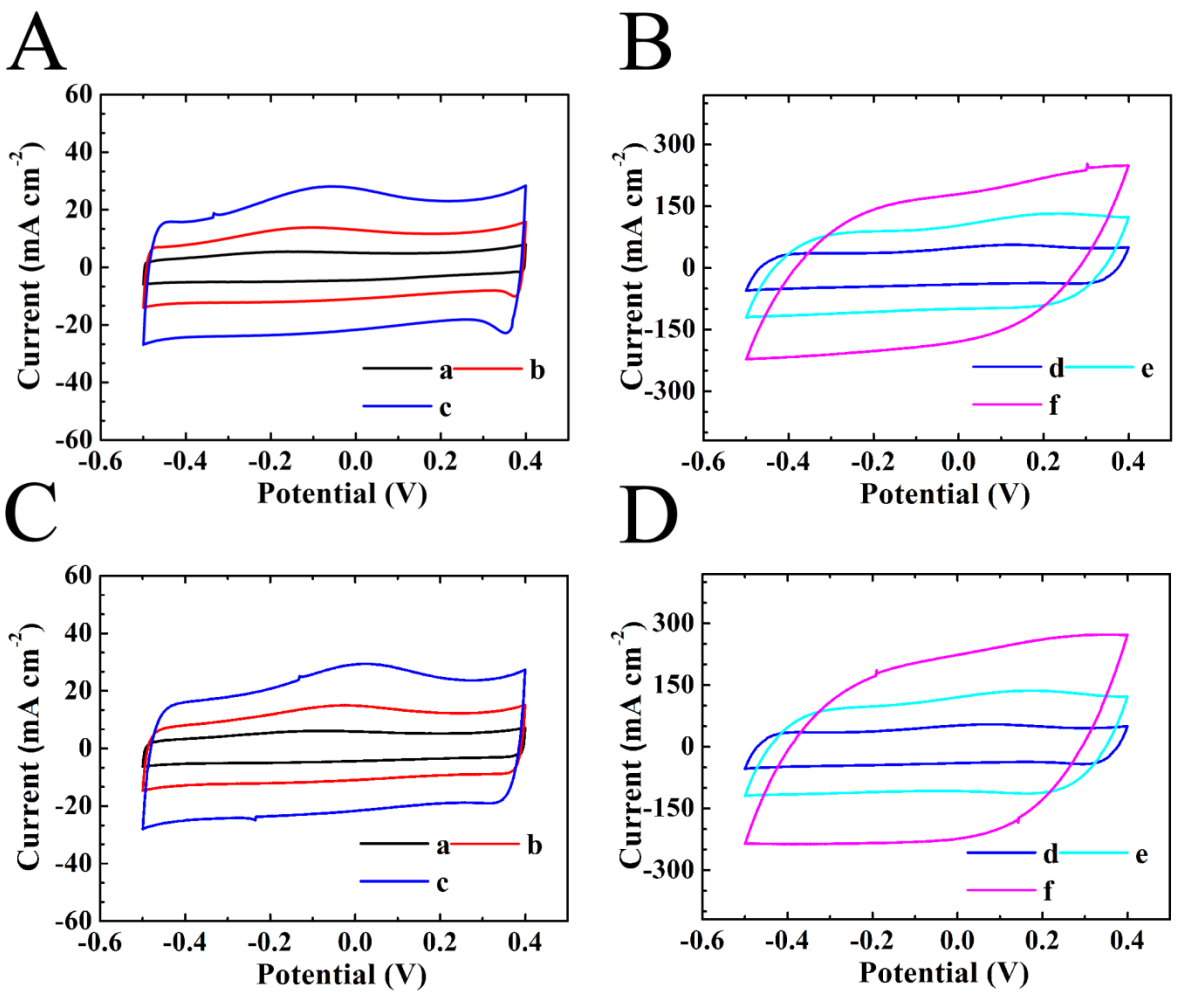

Fig. S3 CVs with mass loading of 15 mg cm^{-2} of PPy nanofiber -MWCNT composite prepared by MG containing (A,B) 20, (C,D) 30 wt.% MWCNT at the scan rate of a) 2, b) 5, c) 10, d) 20, e) 50 and f) 100 mV s^{-1}.

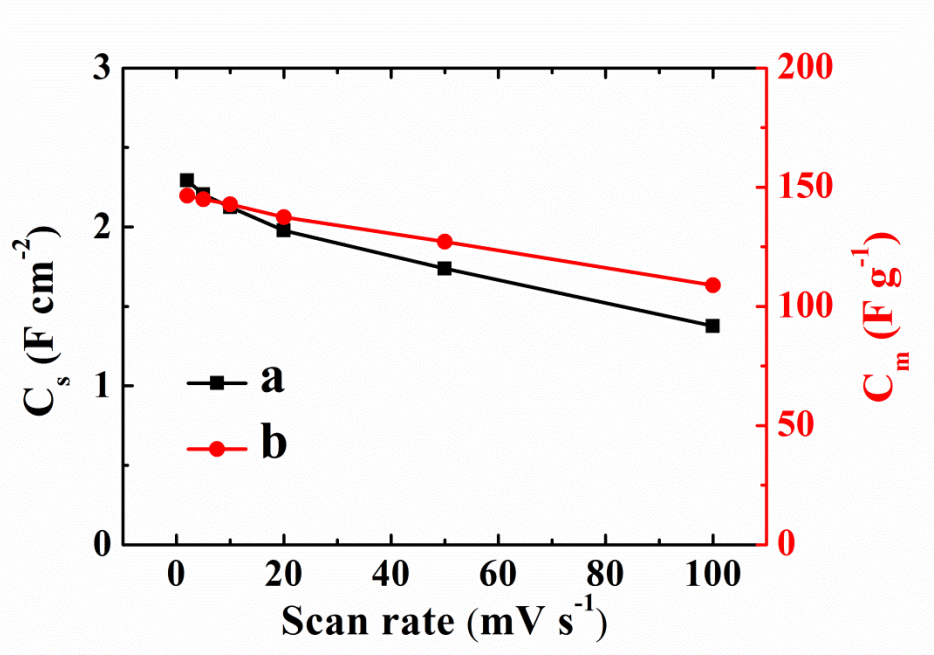

Fig. S4 C_s and C_m obtained from CV data versus scan rate for PPy nanofiber -MWCNT composite prepared by MG containing (a) 20, (b) 30 wt.% MWCNT. The samples have mass loading of 15 mg cm^{-2}.

Table S1 Capacitance derived from CV and impedance spectroscopy data for PPy-based electrodes. C(2) and C(100) were obtained from CV data at scan rates of 2 and 100 mV s^{-1}, respectively. C' was obtained from the impedance spectroscopy data at frequency of 10 mHz. All electrodes have mass loading of 15 mg cm^{-2}.

	$C_s(2)$ ($F\ cm^{-2}$)	$C_m(2)$ ($F\ g^{-1}$)	$C_s(100)$ ($F\ cm^{-2}$)	$C_m(100)$ ($F\ g^{-1}$)	C_s' ($F\ cm^{-2}$)	C_m' ($F\ g^{-1}$)
PPy nanofiber	2.52	168	0.25	17	1.27	85
PPy-MWCNT (10 wt.%) without MG	2.41	161	0.75	51	1.08	72
PPy-MWCNT (10 wt.%) dispersed by MG	2.38	159	1.36	90	1.04	69
PPy-MWCNT (20 wt.%) dispersed by MG	2.29	153	1.38	92	0.95	63
PPy-MWCNT (30 wt.%) dispersed by MG	2.19	146	1.63	109	0.84	56