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

Supporting Information for:

Layered polyaniline/graphene film from sandwich-structured polyaniline/graphene/polyaniline nanosheets for high-performance pseudosupercapacitors

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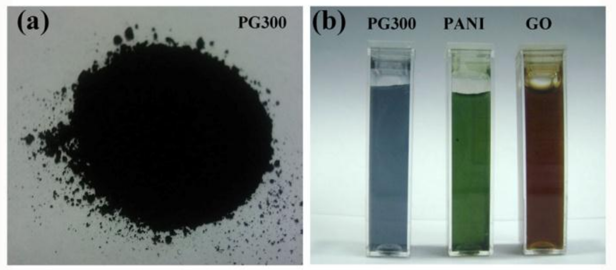

Fig. S1. (a) A digital picture of the PG300; (b) Dispersion stability of PG300, pure PANI and GO in water.

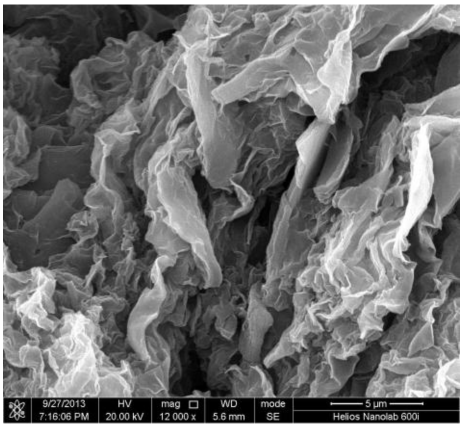

Fig. S2. SEM image of PG300.

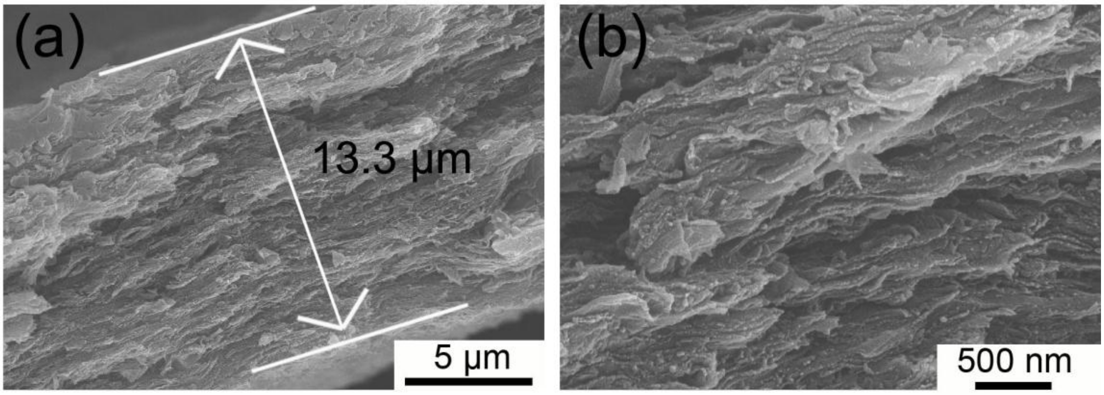

Fig. S3. Cross-section SEM image of PG300 at low magnification (a) and high magnification (b).

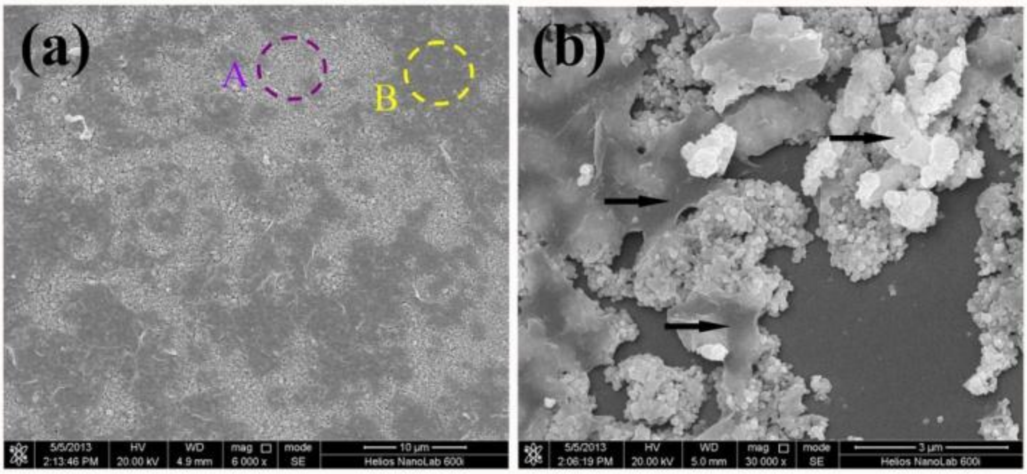

Fig. S4. SEM images of the as-deposited film from PG30 with various magnifications. Dotted line circle "A" exhibits the PANI particles, while the dotted line circle "B" and the nanosheets arrows pointed show the PANI/graphene/PANI sheets.

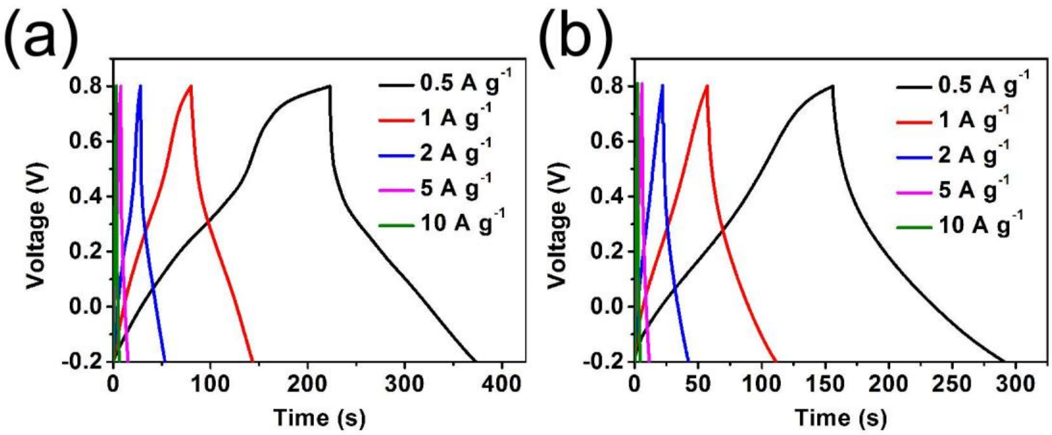

Fig. S5. Galvanostatic charge–discharge curves of PANI (a) and PG30 (b) at different current densities.

Table S1 List of specific capacitance values of various graphene/PANI hybrid electrodes from recent literatures.

Binder-free	Preparation method	Specific capacitance	Measurement condition	Reference (year)
Yes (our work)	Electrophoretic deposition	384 F g^{-1}	0.5 A g^{-1}	(2013)
		312 F g^{-1}	1 A g^{-1}	
		324 F g^{-1}	At 20 mV s^{-1} by CV	
Yes	Layer-by-layer (LbL) assembly	375.2 F g^{-1}	At 0.5 A g^{-1}	[1] (2012)
		ca. 225 F g^{-1} (*)	At 1 A g^{-1}	
	Electropolymerization	233 F g^{-1}	At 20 mV s^{-1} by CV	[2] (2009)
	Vacuum filtration	210 F g^{-1}	At 0.3 A g^{-1}	[3] (2010)
	Electropolymerization	763 F g^{-1}	At 1 A g^{-1}	[4] (2013)
	Chemical polymerization	250 F g^{-1}	At 100 mV s^{-1} by CV	[5] (2012)
	Vacuum filtration	301 F g^{-1}	At 0.5 A g^{-1}	[6] (2011)
	Electropolymerization	202 F g^{-1}(**)	At 0.5 A g^{-1}	[7] (2013)
		181 F g^{-1}(**)	At 1 A g^{-1}	
	Chemical polymerization	385 F g^{-1}	At 0.5 A g^{-1}	[8] (2013)
		362 F g^{-1}	At 1 A g^{-1}	
No	Electrospun	267 F g^{-1} (***)	At 0.35 A g^{-1}	[9] (2013)
	Chemical polymerization	261 F g^{-1}	At 0.5 A g^{-1}	[10] (2010)
		ca. 243 F g^{-1} (*)	At 1 A g^{-1}	
	Chemical polymerization	361 F g^{-1}	At 0.3 A g^{-1}	[11] (2012)
		349 F g^{-1}	At 0.5 A g^{-1}	
		323 F g^{-1}	At 1 A g^{-1}	
	Chemical polymerization	890 F g^{-1} (**)	At 0.5 A g^{-1}	[12] (2013)
	Chemical polymerization	497 F g^{-1}	At 0.5 A g^{-1}	[13] (2012)

Note:

(*): Calculated from the figure of "Variation of the specific capacitance with current density" in the literature, because the authors did not show the exact number in their publication.

(**): The composites were graphene oxide/carbon nanotube/polyaniline composites.

(***): The active materials were pure PANI.

Reference:

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Table S2 List of cyclic stability values of various graphene/PANI hybrid electrodes from recent literatures.

Binder-free	Preparation method	Capacitance retention	Measurement condition	Reference (year)
Yes(our work)	Electrophoretic deposition	84%	At 2 A g^{-1}; 1000 cycles	(2013)
Yes	Layer-by-layer (LbL) assembly	90.7%	At 3 A g^{-1}; 500 cycles	[1] (2012)
	Electropolymerization	82%	At 5 A g^{-1}; 1000 cycles	[2] (2013)
	Vacuum filtration	66.8%	At 0.5 A g^{-1}; 400 cycles	[3] (2011)
	Chemical polymerization	90%	At 5 A g^{-1}; 5000 cycles	[4] (2013)
	Vacuum filtration	79%	At 3 A g^{-1}; 800 cycles	[5] (2010)
No	Chemical polymerization	89%	At 1 A g^{-1}; 1000 cycles	[6] (2013)
	Chemical polymerization	87.4%	At 3 A g^{-1}; 10000 cycles	[7] (2013)
	Chemical polymerization	82%	At 0.3 A g^{-1}; 10000 cycles	[8] (2012)
	Chemical polymerization	94.3%	At 1 A g^{-1}; 2000 cycles	[9] (2012)
	Chemical polymerization	92%	At 1 A g^{-1}; 2000 cycles	[10] (2010)

Reference:

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