Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Flexible and High Energy Density Solid-State Asymmetric Supercapacitor Based on Polythiophene Nanocomposites and Charcoal

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Table S1. Weight loses at different temperature range of PTH, PTHA1, PTHA3, and PTHA5 composites.

Samples	Initial temperature range (˚C)	Weight loss (%)	Decomposition temperature range (˚C)	Weight loss (%)	Total Weight loss (%)
PTH	30-70	4.26	190-626	89.91	94.17
PTHA1	30-77	5.11	191-607	54.44	59.55
PTHA2	30-74	4.74	194-579	31.26	36
PTHA5	30-82	6.26	186-569	23.58	29.84

Table S2. Specific capacitance calculated from CV for PTHA and Charcoal electrode for various current densities.

Scan rate (mV/s)	Specific capacitance (F/g) for PTHA	Specific capacitance (F/g) for Charcoal
10	582.23	491
30	391.55	376.49
50	342.44	331.07
100	218.7	230.95

Table S3. Comparison of Energy density and power density of PTHA//Charcoal ASC with other reported results.

ASC Electrode material	Energy density (W h/kg)	Power density (W/kg)	References
PANI G@MnO_2	30.6	197	S1
VS2// C-Fe/PANI	27.8	2991.5	S3
NMP2 ASC	34.4	500	S5
PTHA//Charcoal	42.00	735.86	Present work

Table S4. Specific capacitance calculated from GCD for PTHA and Charcoal electrode for various current densities.

PTHA		Charcoal	
Current density (A/g)	Specific capacitance (F/g)	Current density (A/g)	Specific capacitance (F/g)
1	554.03	1.4	374.71
1.4	494.05	2	347.83
2	433.33	3	316.06
3	386.45	4	279.44

Reference

(S1). M. A. Bavio, G. G. Acosta, T. Kessler and A. Visintin, Energy, 2017, **130**, 22-28.

(S3). M. N. Rantho, M. J. Madito, F. O. Ochai-Ejeh and N. Manyala, Electrochim. Acta, 2018, **260**, 11-23.

(S5). H. Wang, Y. Song, J. Zhou, X. Xu, W. Hong, J. Yan and J. Gao, Electrochim. Acta, 2016, **212**, 775-783.