Electronic Supplementary Material (ESI) for Materials Advances.

Hierarchical porous-structured self-standing carbon nanotube electrode for high-power lithium–oxygen batteries

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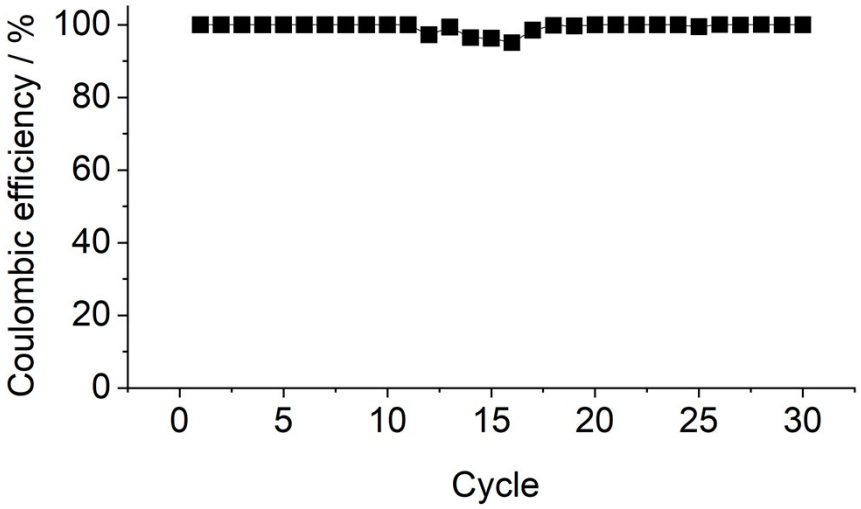

Fig. S1 Plot of coulombic efficiency versus cycle number in NIPS-CNT LOB cells operated at current densities of 2.0 and 0.2 mA cm-2 during the discharging and charging processes, respectively.

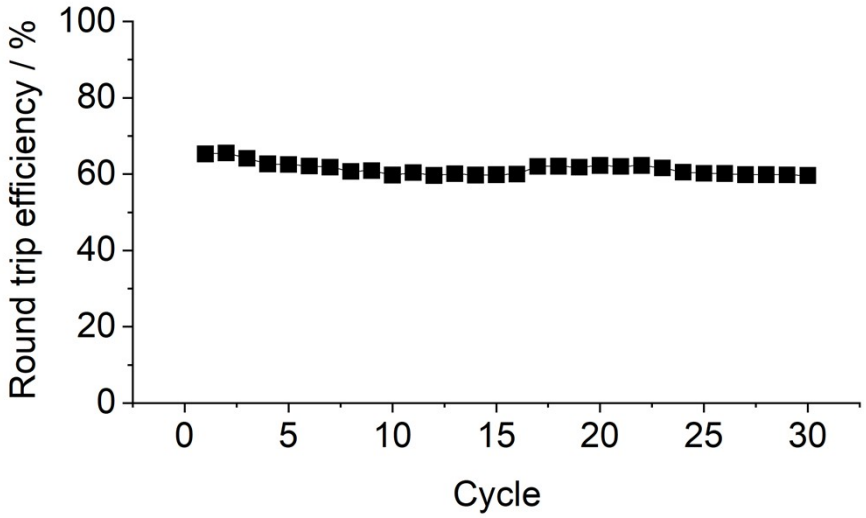

Fig. S2 Plot of round trip efficiency versus cycle number in NIPS-CNT LOB cells operated at current densities of 2.0 and 0.2 mA cm-2 during the discharging and charging processes, respectively.

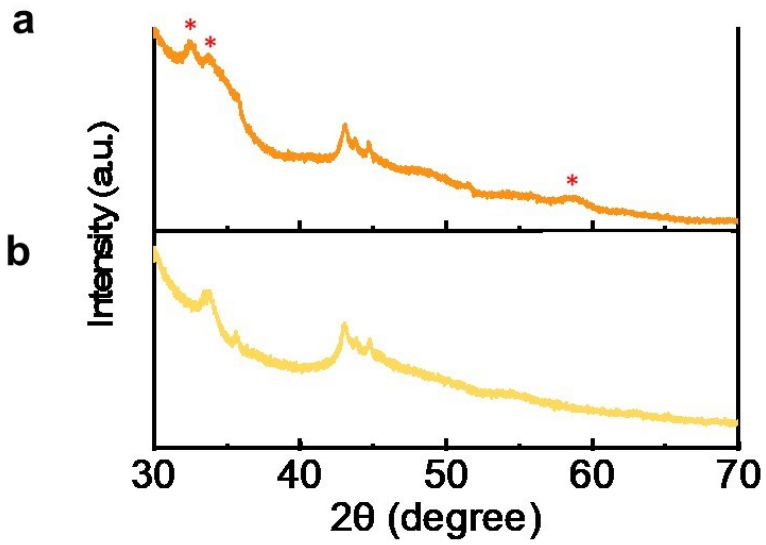

Fig. S3 XRD profile of NIPS-CNT electrodes taken out from LOB cell after (a) 1st discharge and (b) 1st charge process. The current density during discharge and charge process was set to 2.0 and 0.2 mA cm^{-2}. Peaks assignable to Li_2O_2 are shown as asterisk.

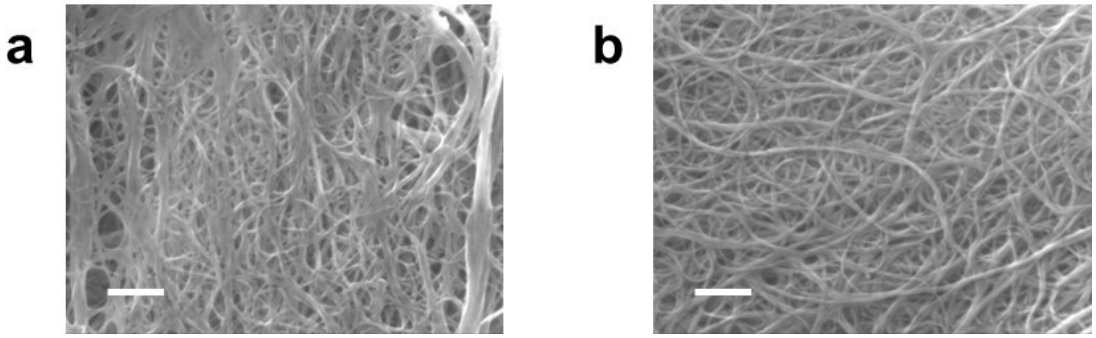

Fig. S4 SEM images of NIPS-CNT electrodes taken out from LOB cell after (a) 1st discharge or (b) 1st charge process. The current density during discharge and charge process was set to 2.0 and 0.2 mA cm^{-2}. Scale bars are 500 nm.

Table S1. Summary of LOB performance reported in the literatures in the region of E/C lower than 25 g A^{-1} h^{-1}

Carbon		Electrolyte	Capacity	Current density	Discharge voltage	Power density	E/C	Cycle life	Ref.
Material	(mg cm^{-2})	(mg cm^{-2})	(mA h cm^{-2})	(mA cm^{-2})	(V)	(mW cm^{-2})			
CNT	3.6	17.6	2	2	2.3	4.60	8.80	30	This work
KB	1.00	8.30	3.00	0.30	2.69	0.81	2.77	6	3
KB	5.40	28.20	4.00	0.40	2.72	1.09	7.05	37	3
Super P	30.00	40.82	13.45	0.50	2.75	1.38	3.03	2	15
Super P	30.00	40.82	9.74	0.50	2.75	1.38	4.19	3	15
Super P	30.00	40.82	6.70	0.50	2.75	1.38	6.09	4	15
Super P	30.00	40.82	3.38	0.50	2.75	1.38	12.08	8	15
CNT	0.20	59.80	12.60	0.50	2.50	1.25	4.75	11	16
CNT	0.20	59.80	1.20	0.50	2.50	1.25	49.83	170	16
CNT	7.50	87.50	10.00	1.50	2.50	3.75	8.75	7	17
CNT	7.50	87.50	4.50	1.50	2.50	3.75	19.44	40	17
CNT	7.50	87.50	3.00	1.50	2.50	3.75	29.17	45	17
CNT	7.50	87.50	1.50	1.50	2.50	3.75	58.33	315	17