

Hybrid-type Li-air battery based on a polypyrrole/carbon nanocomposite catalyst as a cathode.

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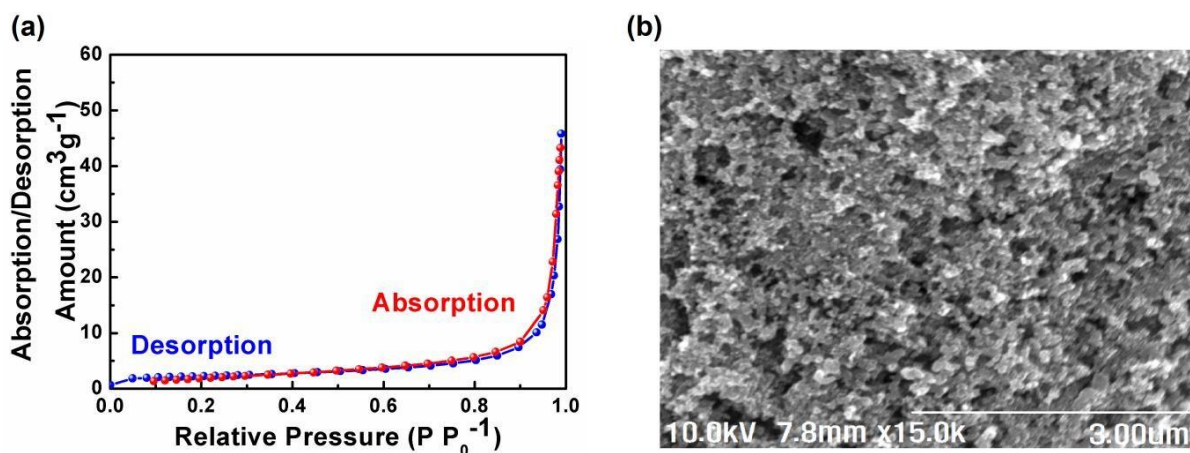


Figure S1. Surface area, surface morphology analysis of the Vulcan carbon black (Vulcan XC 72R); (a) N₂ adsorption-desorption measurements plot by use of BET calculation method, (b) SEM image.

Table S1. N₂ adsorption-desorption measurement data by use of BET calculation method.

	PPyC nano composite	Vulcan carbon black
Surface Area (m ² g ⁻¹)	807.37	250.12
Total pore volume (P/P ₀ =0.990, cm ³ g ⁻¹)	2.6727	2.3067
Average pore diameter (nm)	13.242	37.009

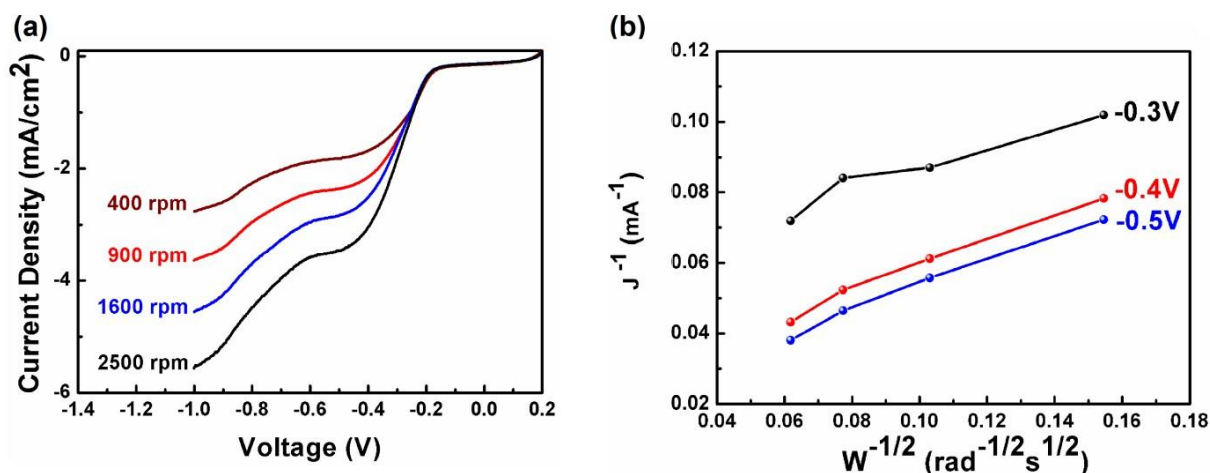


Figure S2. (a) Linear sweep voltammetry (LSV) plot of the Vulcan carbon black (Vulcan XC 72R, fuel cell store, Inc.) at different rotating speeds from 400 rpm to 2500 rpm by use of a rotating disk electrode measurements with Pt wire and Hg/HgO as a counter electrode and a reference electrode, respectively, in O₂ saturated 0.1M LiOH solution and (b) The corresponding Koutecky-Levich Plots at different potentials from -0.3 V to -0.5 V.

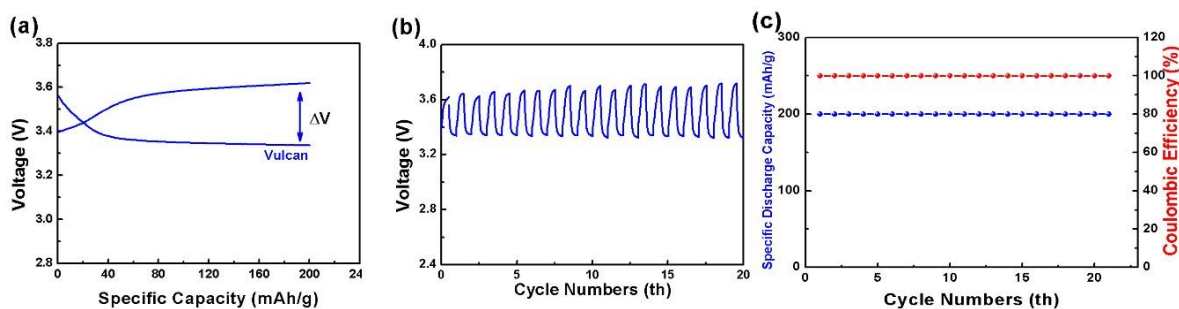


Figure S3. Electrochemical performance of the hybrid type Li-air batteries with the Vulcan carbon black (Vulcan XC 72R) and Li-metal as a cathode and an anode, respectively; (a) Galvanostatic charge-discharge graph at 1st cycle, (b) Cyclic performance graph during 20 cycles, and (c) specific discharge capacities and coulombic efficiencies during 20 cycles.