

Fig. S1 (a) XPS survey spectrum, (b) High-resolution C 1s XPS spectrum, and (c) High-resolution N 1s XPS spectrum of NG.

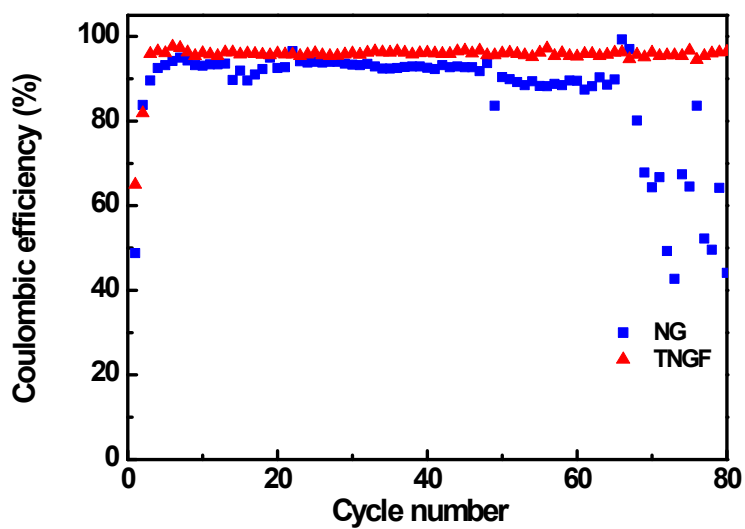


Fig. S2 Coulombic efficiency of TNGF and NG electrodes at a cycling capacity of 1 mAh cm⁻² and a current density of 2 mA cm⁻².

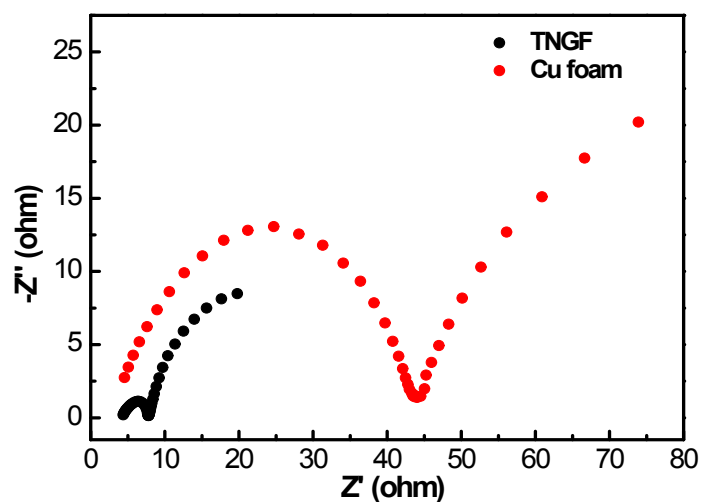


Fig. S3 Nyquist plots of the TNGF electrode and a three-dimensional copper foam electrode after cycling 120 times, obtained by electrochemical impedance spectroscopy (EIS) measurements. The semicircle at the high frequency range is a good indicator of the resistance of lithium ion migration through the interface and the charge transfer resistance. The much smaller semicircle diameter for TNGF than that for a three-dimensional porous copper foam electrode reflects the structural and interfacial merits of TNGF in ensuring electron and lithium ion transport upon Li stripping/plating.

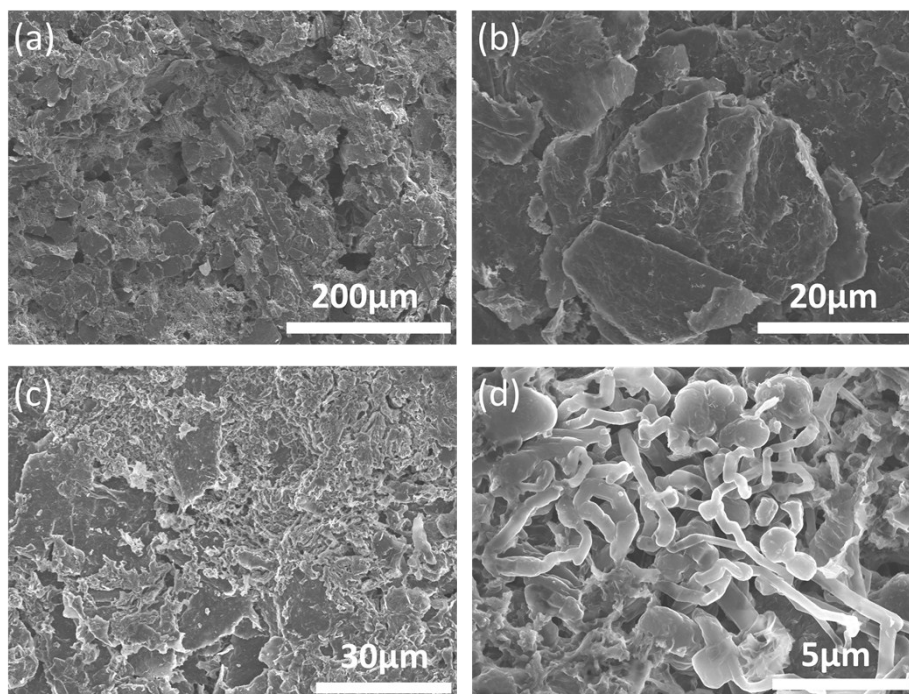


Fig. S4 SEM images of NG (a, b) before and (c, d) after Li deposition.

Capacity (mAh cm ⁻²)	Coulombic efficiency (%) / Cycle number	Anode	Reference
0.5	97/67	3D glass fiber cloths	S1: <i>Adv. Mater.</i> 2016, 28, 2888
0.5	93/50	SEI-coated graphene foam	S2: <i>ACS Nano</i> 2015, 9, 6373
1	96/50	2D atomic crystal layer (<i>h</i> -BN and graphene)	S3: <i>Nano Lett.</i> 2014, 14, 6016
1	94/90	porous Li ₂ O-Cu nanoclusters	S4: <i>ACS Appl. Mater. Interfaces</i> 2016, 8, 26801
1	92/100	3D graphene@Ni foam	S5: <i>ACS Appl. Mater. Interfaces</i> 2016, 8, 26091
1	90/100	CNT films	S6: <i>ACS Appl. Mater. Interfaces</i> 2017, 9, 4605
1	98/100	3D semi-tubular carbon film	S7: <i>Nano Energy</i> 2017, 38, 504
1	97.9/120	3D oxidized polyacrylonitrile nanofiber network	S8: <i>Nano Lett.</i> 2015, 15, 2910
2	90/50	SiO ₂ @PMMA core-shell nanosphere	S9: <i>ACS Cent. Sci.</i> 2017, 3, 135
2	98/50	N-doped graphene	S10: <i>Angew. Chem., Int. Ed.</i> 2017, 56, 7764
2	98/120	TNGF	This work

Table S1 Comparison of the performance of TNGF and different kinds of electrodes reported recently under the same current density of 1 mA cm⁻².

References:

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