

Supporting Information

Facile synthesis of flower-like hierarchical NiCo₂O₄ microspheres as high-performance cathode materials for Li-O₂ batteries

Liangjun Wang,^a Ting Zhu,^b Zhiyang Lyu,^c Jian Zhang,^c Lili Gong,^a Shuning Xiao,^d Jia Liu,^e Wenhao Dong,^c Xinhang Cui,^a Ghim Wei Ho^b and Wei Chen^{*a,c,f,g,h}

^aDepartment of Physics, National University of Singapore, 2 Science Drive 3, 117542, Singapore. E-mail: phycw@nus.edu.sg; Fax: +65 6777 6126; Tel: +65 6516 2921

^bDepartment of Electrical and Computer Engineering, National University of Singapore, 4 Engineering Drive 3, 117583, Singapore

^cDepartment of Chemistry, National University of Singapore, 3 Science Drive 3, 117543, Singapore

^dEducation Ministry Key Lab of Resource Chemistry, Shanghai Key Laboratory of Rare Earth Functional Materials, International Joint Lab of Resource Chemistry SHNU-NUS-PU, Department of Chemistry, Shanghai Normal University, Shanghai 200234, China.

^eDivision of Chemistry and Biological Chemistry, School of Physical and Mathematical Sciences, Nanyang Technological University, 21 Nanyang Link, 637371, Singapore

^fCentre for Advanced 2D Materials and Graphene Research Centre, National University of Singapore, 6 Science Drive 2, 117546, Singapore

^gNational University of Singapore (Suzhou) Research Institute, Suzhou 215123, China

^hSZU-NUS Collaborative Innovation Center for Optoelectronic Science & Technology, Shenzhen University, Shenzhen 518060, China

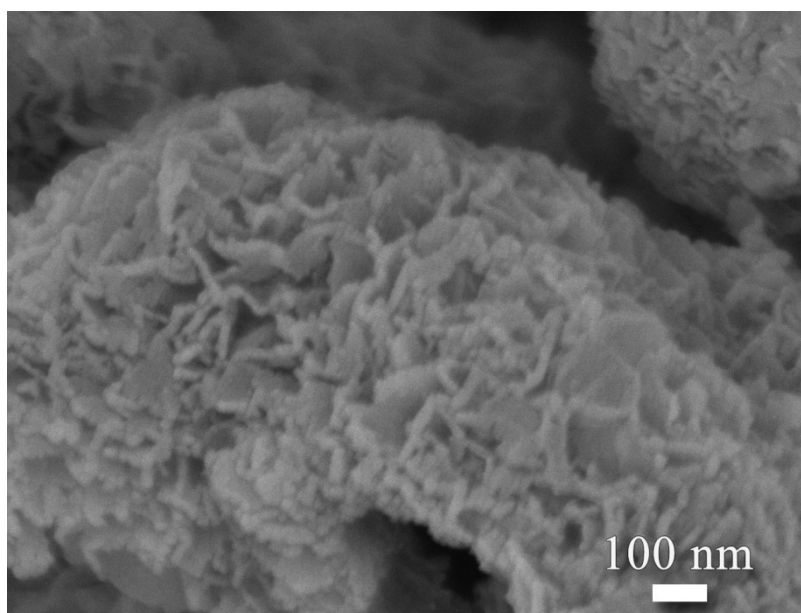


Fig. S1 SEM image of individual broken NiCo₂O₄ microspheres.

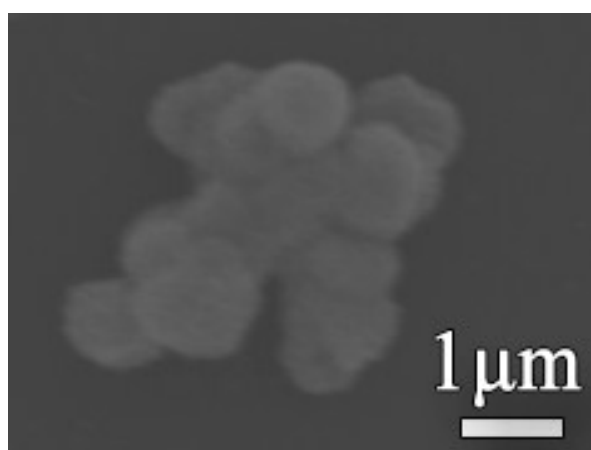


Fig. S2 SEM image that represents the elemental mapping.

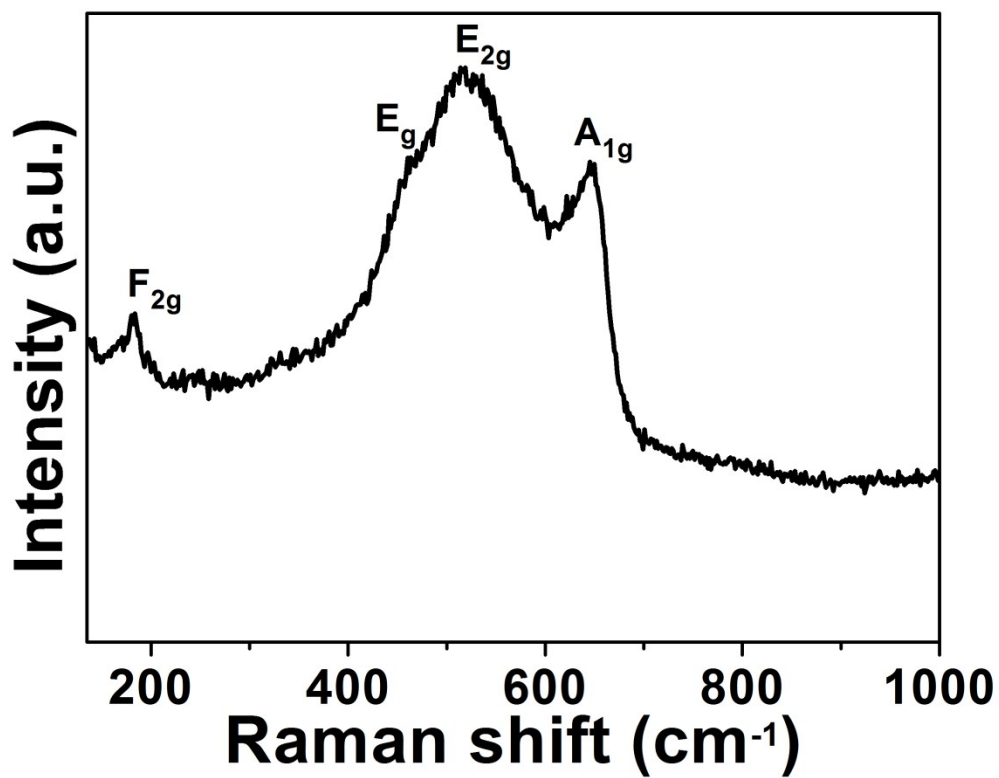


Fig. S3 (a) Raman spectra of as-prepared NiCo_2O_4 microspheres.

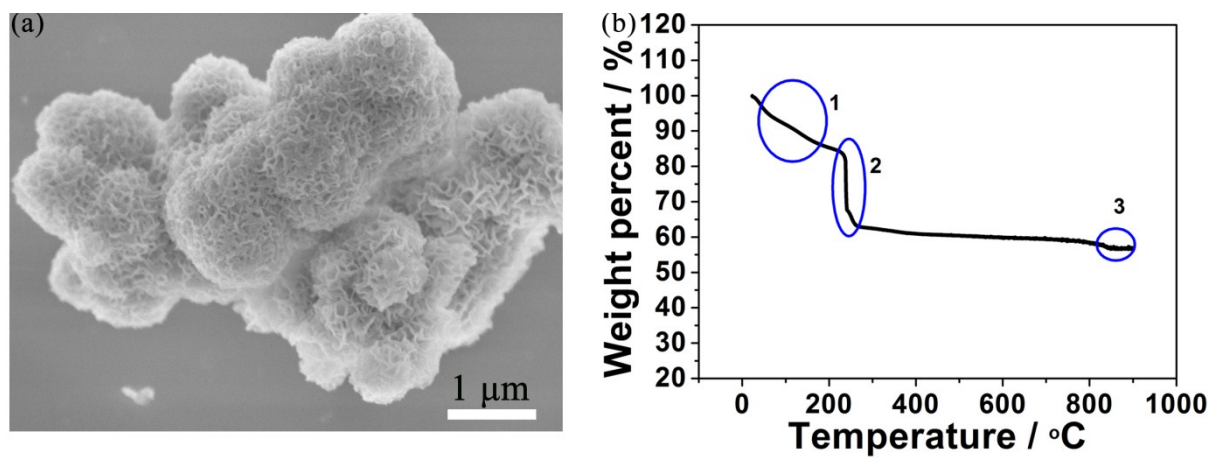


Fig. S4 (a) SEM image and (b) TGA curves of NiCo_2O_4 microspheres precursor.

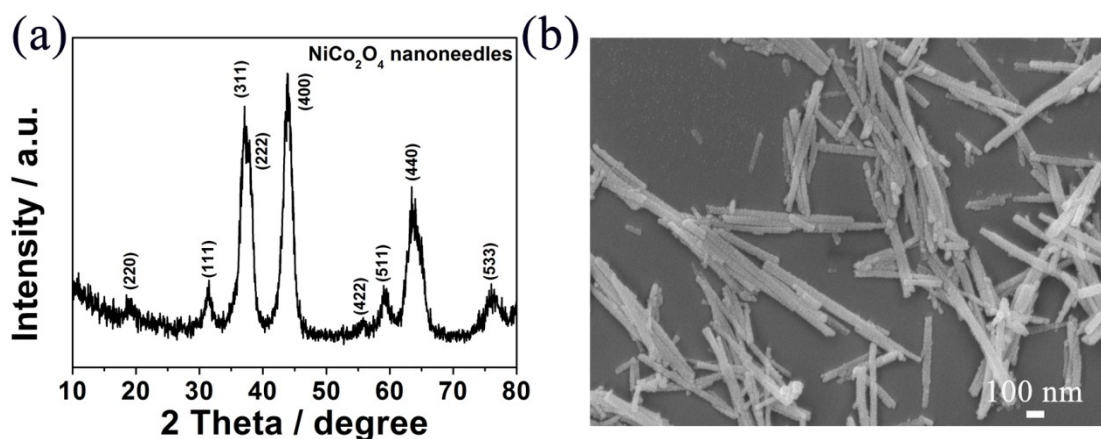


Fig. S5 (a) XRD pattern and (b) SEM image of as-prepared NiCo₂O₄ nanoneedles.

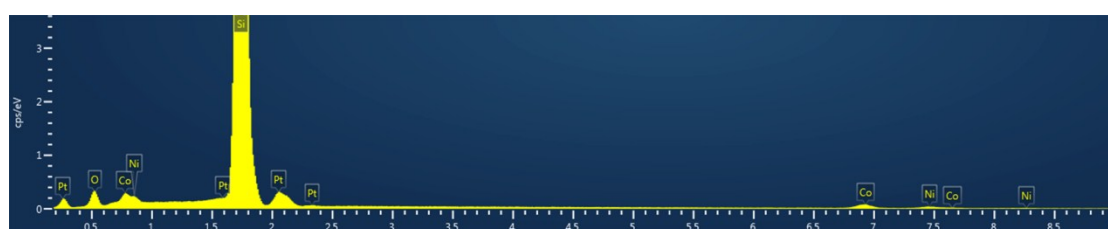


Fig. S6 EDX patterns of the as-prepared NiCo₂O₄ microspheres. It should be noted that Si signal is attributed to that the used Si substrate and Pt signal comes from Pt sputtering to get a clear FESEM images.

Cathode material	Discharge/charge Voltage gap (V)	Ref.
Mesoporous NiCo ₂ O ₄ nanoflakes	~1.3	1
Ordered mesoporous NiCo ₂ O ₄	~1.15	2
Hierarchical NiCo ₂ O ₄ nanorods	~1.1	3
Hierarchical porous NiCo ₂ O ₄ @Ni	Discharge: sloping from 2.6 to 2.3 V Charge: sloping from 3.5 to 4.1 V	4
Urchin-like spinel NiCo ₂ O ₄	~1.05	5
NiCo ₂ O ₄ nanoneedles	1.25	Our work
NiCo ₂ O ₄ microspheres	0.86	

Table S1 A summary of previous results about NiCo₂O₄ based cathode for Li-O₂ batteries.

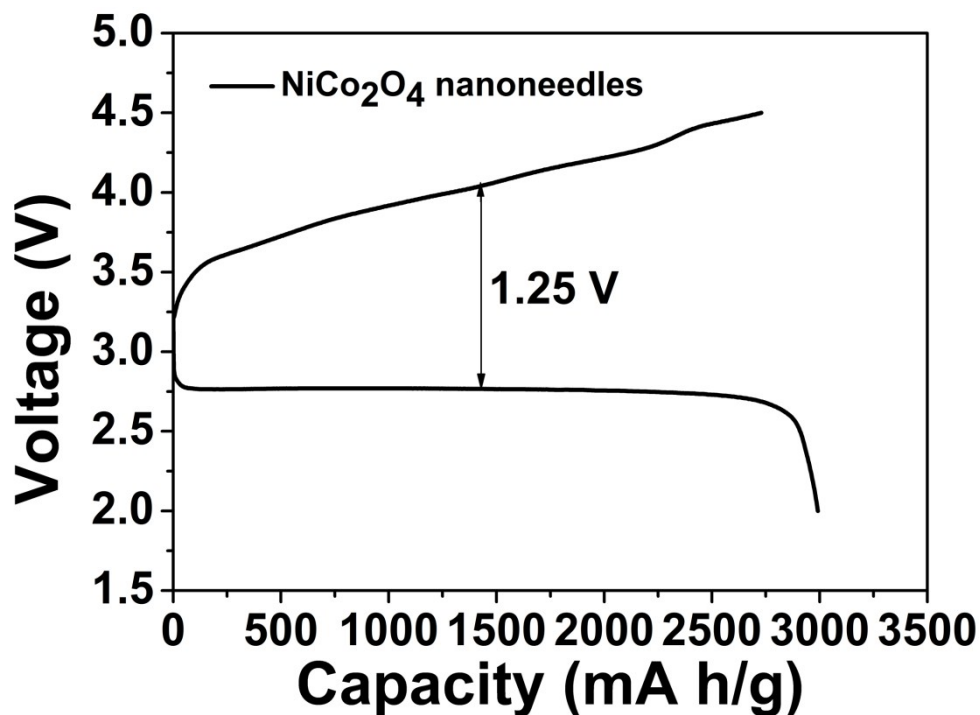


Fig. S7 First full discharge/charge profiles of Li-O₂ batteries with NiCo₂O₄ nanoneedles cathodes at a current density of 0.08 mA/cm².

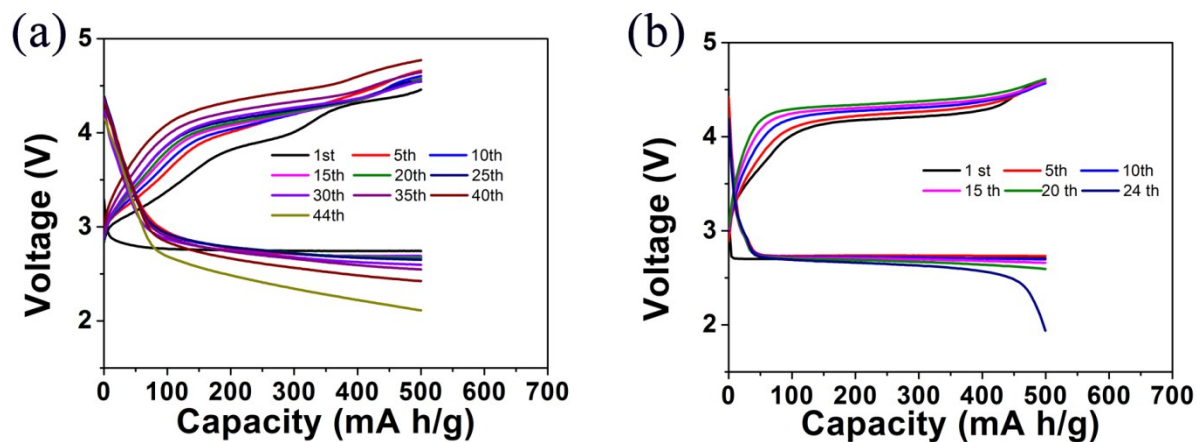


Fig. S8 Cycling performance of Li-O₂ batteries with (a) NiCo₂O₄ nanoneedles and (b) bare VX-72 carbon cathode at 500 mA h/g capacity limit.

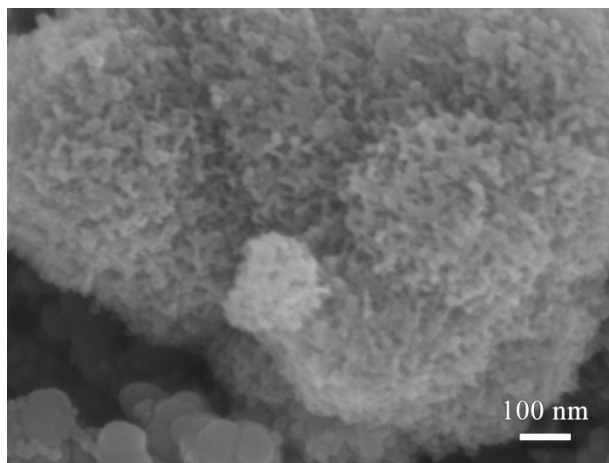


Fig. S9 SEM image of NiCo₂O₄ microspheres electrode after 60 cycles.

References

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