

Electronic Supplementary Material (ESI) for Nanoscale
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Electronic Supporting Information

Reprocessable Squeezing Electrode Fabrication of Olive-Like Fe/Co/O Nanoparticles@Three Dimensional Nitrogen-doped Reduced Graphene Oxide for High Performance Lithium Battery

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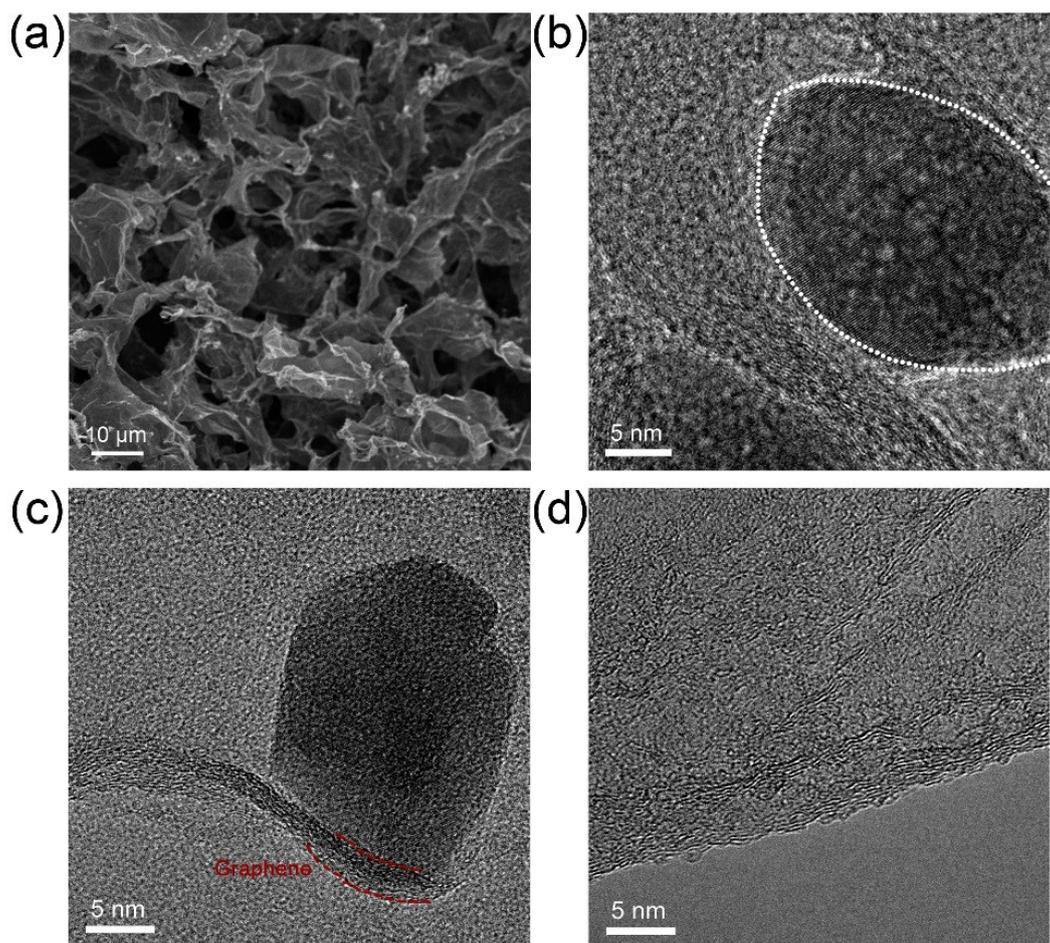


Figure S1 (a) SEM image of the obtained 3D macroporous structure. (b) (c) HRTEM images of olive-like nanoparticles existed between graphene layers. (d) HRTEM image of folded edges of graphene.

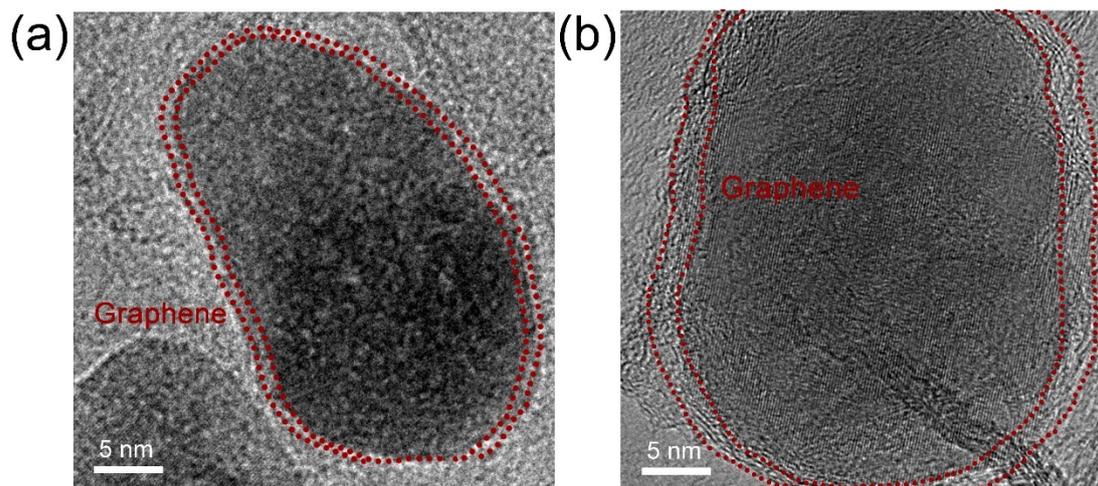


Figure S2 HRTEM images of olive-like nanoparticles embedded between continuous conductive networks.

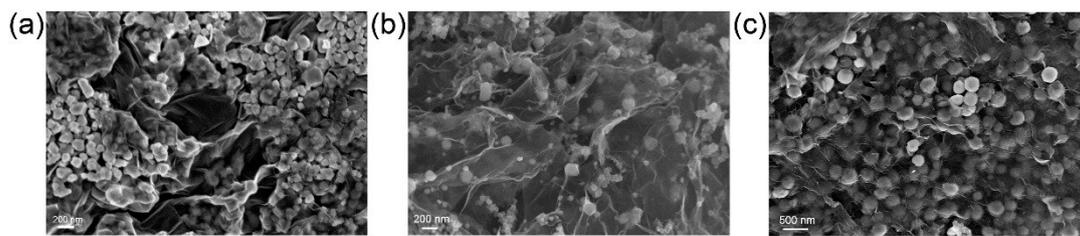


Figure S3 (a) SEM image of physical mixture Fe/Co/O+3D N-rGO. (b)SEM image of individual growth of Fe_2O_3 or in 3D N-doped reduced graphene oxide structure. (c) $\text{Co}_3\text{O}_4@3\text{D N-rGO}$.

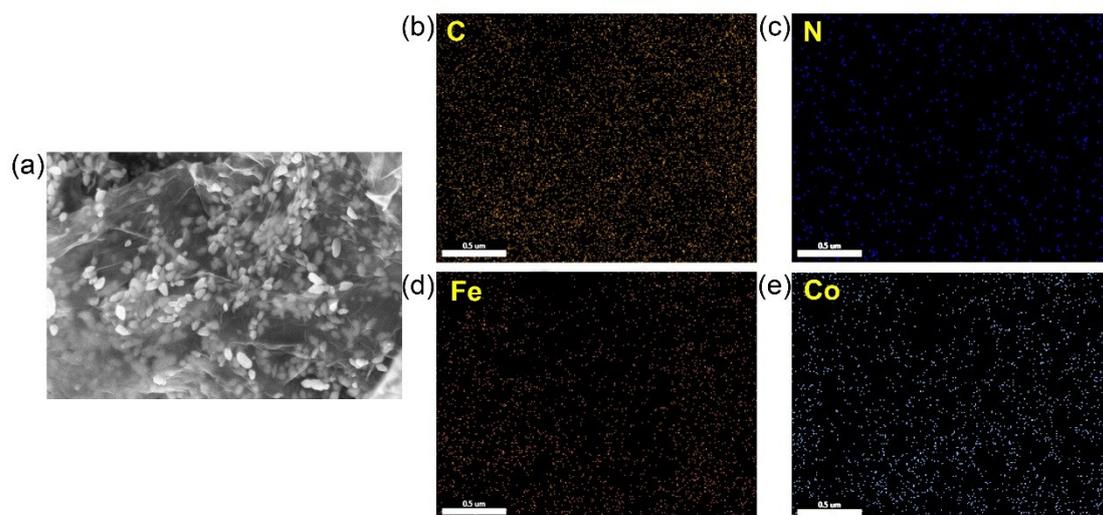


Figure S4 (a) SEM image of Fe/Co/O @ 3D N-rGO composite. (b-e) the corresponding EDX mapping images of C (b), N (c), Fe (d) and Co (e) elements.

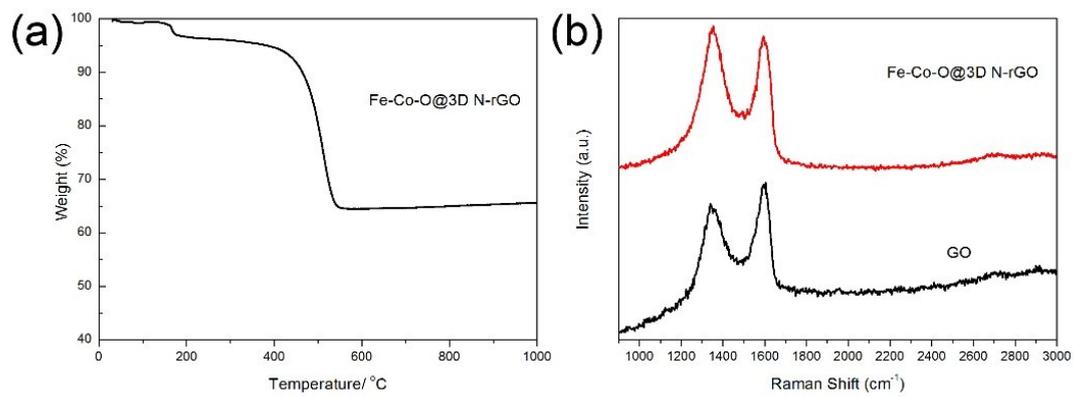


Figure S5 (a) TGA curves (b) Raman spectra of Fe/Co/O@3D N-rGO and GO.

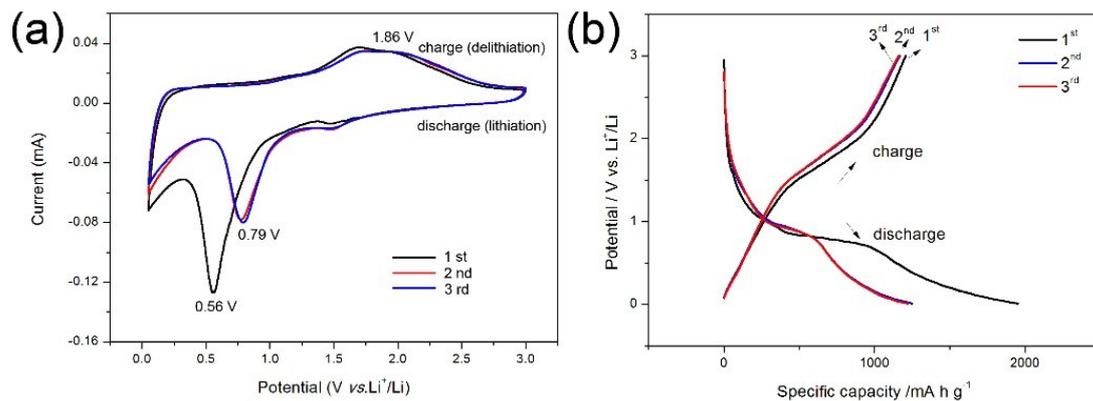


Figure S6 (a) CVs for the first three cycles at a potential scanning rate of 0.1 mV s^{-1} . (b) Typical charge-discharge voltage curves of the Fe/Co/O @3D N-rGO electrode at a current density of 1000 mA g^{-1} .

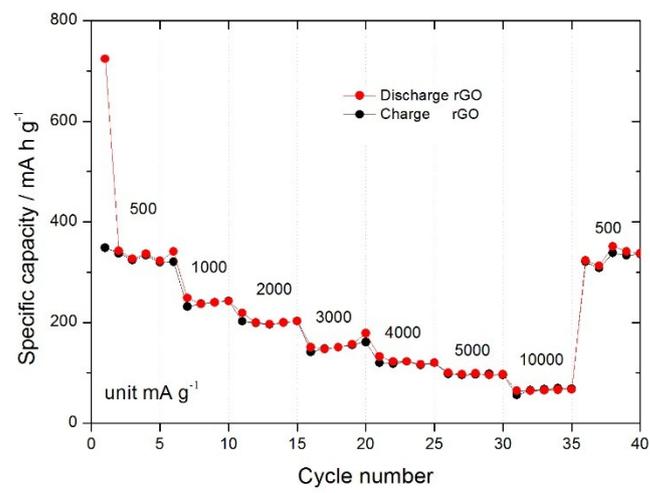


Figure S7 Rate capacity of rGO at different current densities.

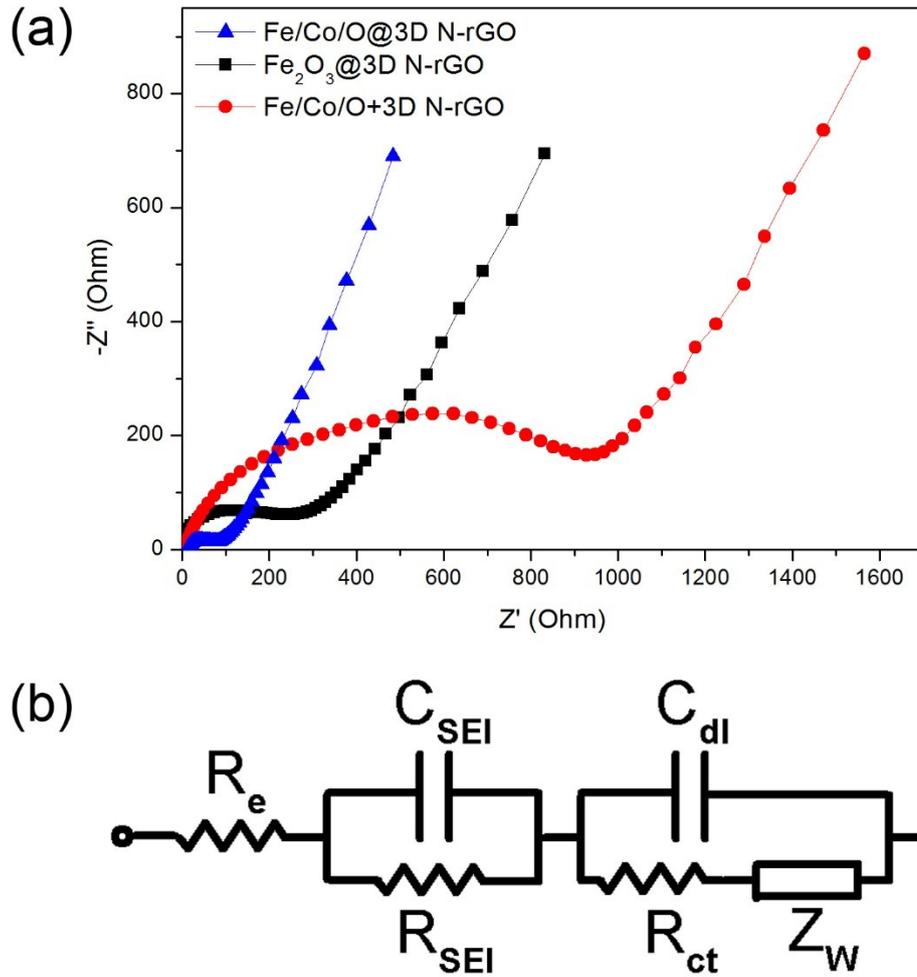


Figure S8 (a) Nyquist plots of the obtained Fe/Co/O@3D N-rGO, Fe₂O₃@3D N-rGO and Fe/Co/O+3D N-rGO. (b) Randles equivalent circuit for the three samples.

Table S1 Impedance parameters derived using the equivalent circuit model for Fe/Co/O@3D N-rGO, Fe₂O₃@3D N-rGO and Fe/Co/O+3D N-rGO

Samples	R _{SEI} (Ω)	R _{ct} (Ω)
Fe/Co/O@3D N-rGO	27.9	30.7
Fe ₂ O ₃ @3D N-rGO	78.4	159.2
Fe/Co/O+3D N-rGO	149.8	581.9

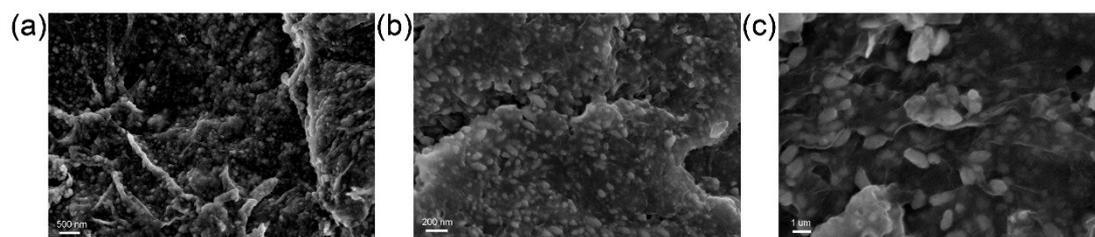


Figure S9 SEM images of the free-standing Fe/Co/O@3D N-rGO electrode after 500 cycles at the current density of 1000 mA g^{-1} .