# Rational design of $NiFe_2O_4$-rGO by tuning the compositional chemistry and their enhanced performance for Li-ion battery anode

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The Raman spectra was conducted using HORIBA Jobin Yvon HR800. The particle size distributions were obtained from SEM. This manuscript focuses on the rational design of $NiFe_2O_4$-rGO and reveals a tendency of lithium storage performance with increased $NiFe_2O_4$ clusters. If the exact ratio of Ni and Fe in the composite is needed, the ICP-AES technology may be adopted.

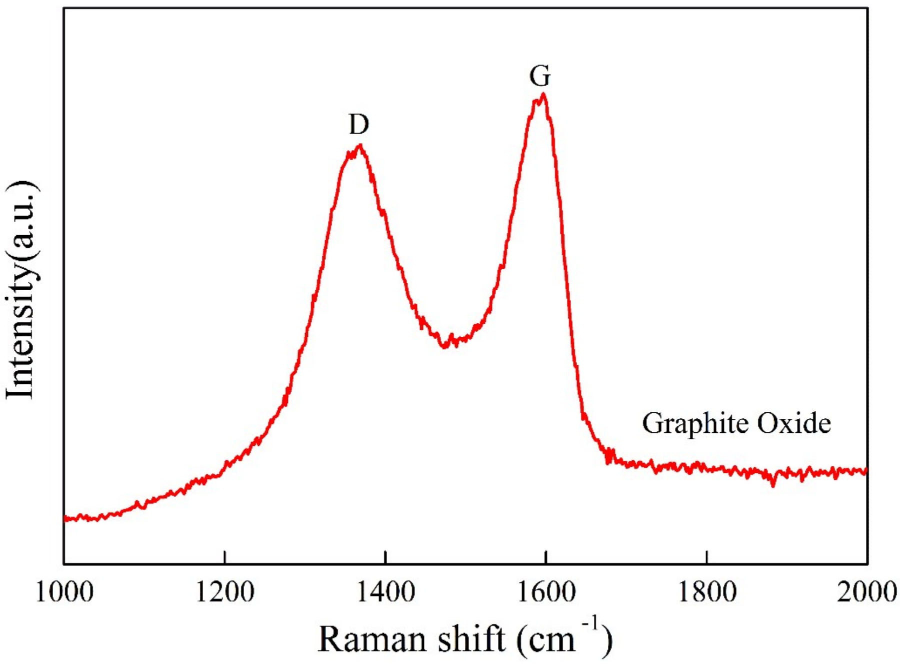


**Fig. S1.** Raman spectra of graphite oxide.

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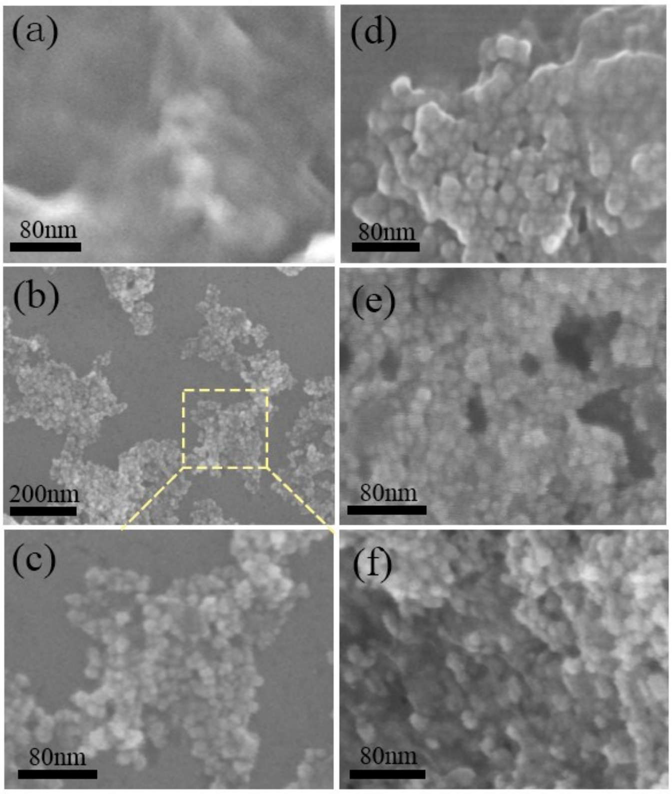


**Fig. S2.** SEM images of (a) Ni-Fe-G1, (b-c) Ni-Fe-G2, (d) Ni-Fe-G3, (e) Ni-Fe-G4, and (f) Ni-Fe-G5.

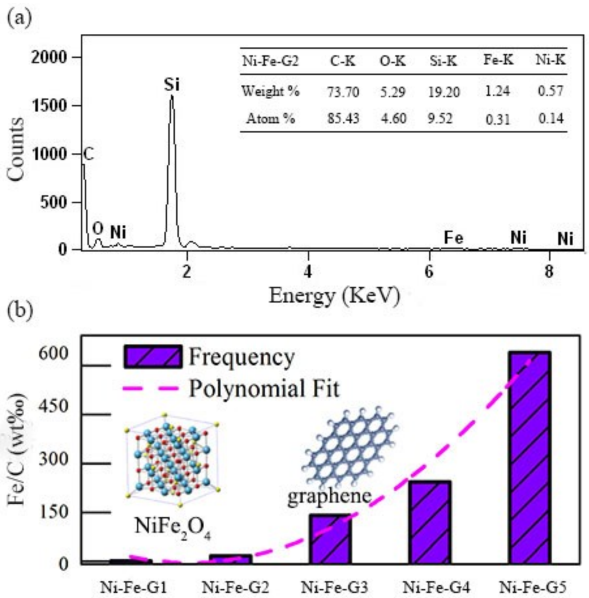


**Fig. S3.** (a) EDS of Ni-Fe-G2, and (b) the weight ratios of Fe/C for $NiFe_2O_4$-rGO.

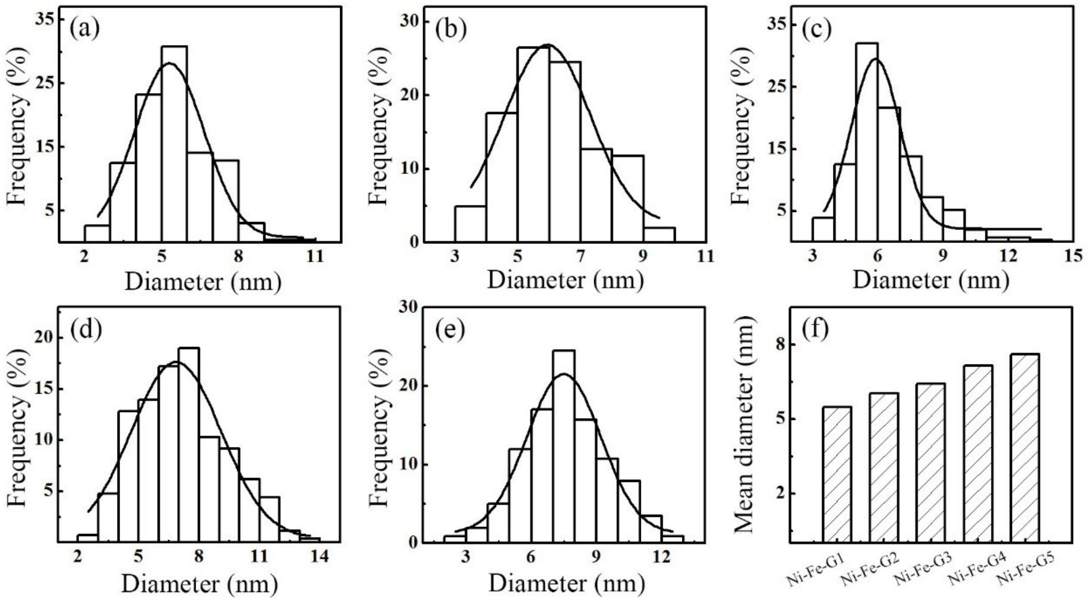


**Fig. S4.** The particle size distributions of (a) Ni-Fe-G1, (b) Ni-Fe-G2, (c) Ni-Fe-G3, (d) Ni-Fe-G4, and (e) Ni-Fe-G5. (f) Average particle size of $NiFe_2O_4$-rGO.

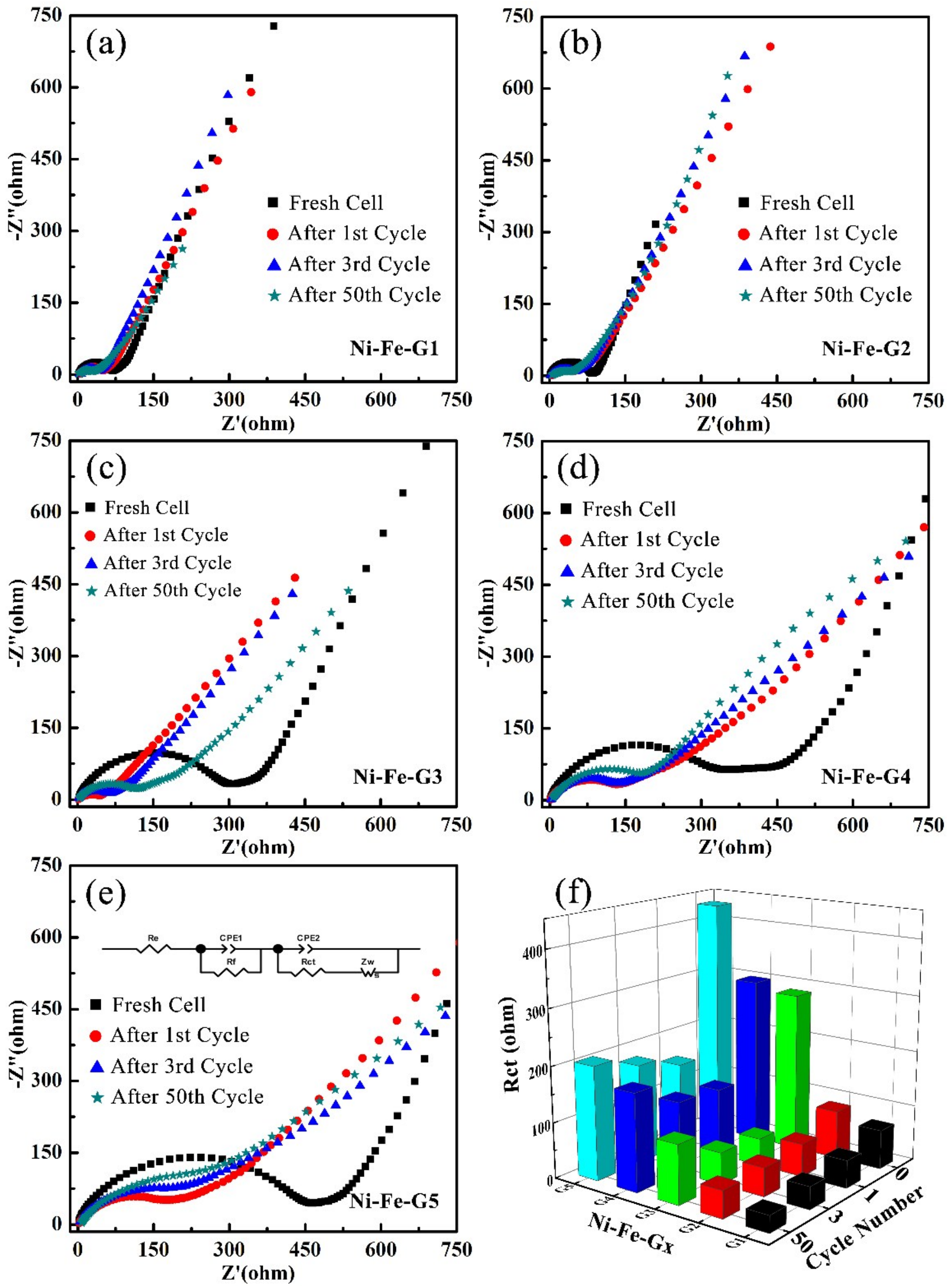


**Fig. S5.** Electrochemical impedance spectroscopy profiles of (a) Ni-Fe-G1, (b) Ni-Fe-G2, (c) Ni-Fe-G3, (d) Ni-Fe-G4, and (e) Ni-Fe-G5. (f) 3D plot of $R_{ct}$ for $NiFe_2O_4$-rGO.