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Electronic Supplementary Information

Controlled self-assembly of Ni foam supported poly(ethyleneimine)/reduced graphene oxide three-dimensional composite electrodes with remarkable synergistic effects for efficient oxygen evolution

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The catalytic performance of NF@$(PEI/RGO)_1$ (pH=7), NF@$(PEI/RGO)_1$, NF@$(PEI/RGO)_2$ (pH=7), and NF@$(PEI/RGO)_2$ measured in 0.1 M KOH (Table S2).

FESEM images of NF after chronopotentiometry at a current density of 10 mA cm^{-2} for 18.8 h and 350 cycles of CV measurement (Fig. S5).

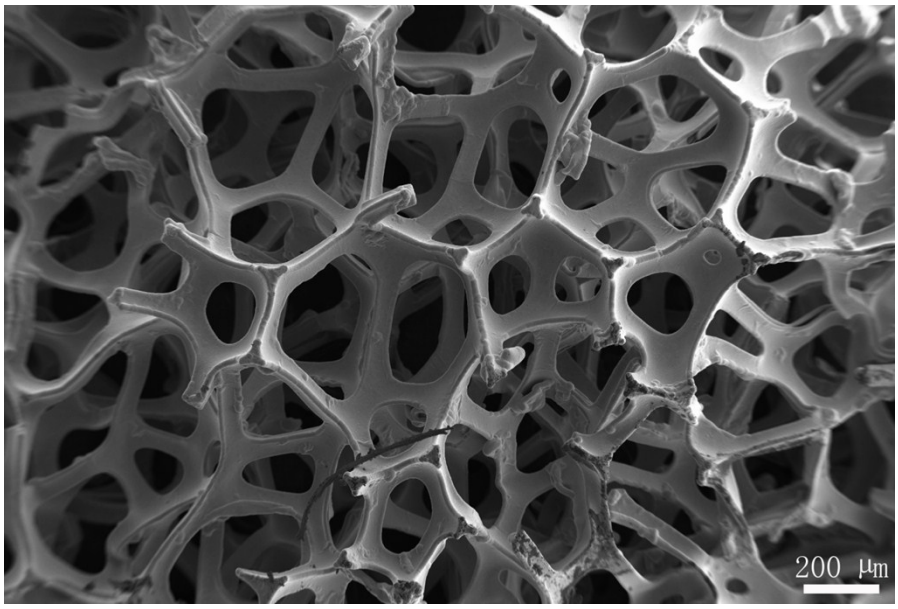

Figure S1. Large-area FESEM image of pristine NF.

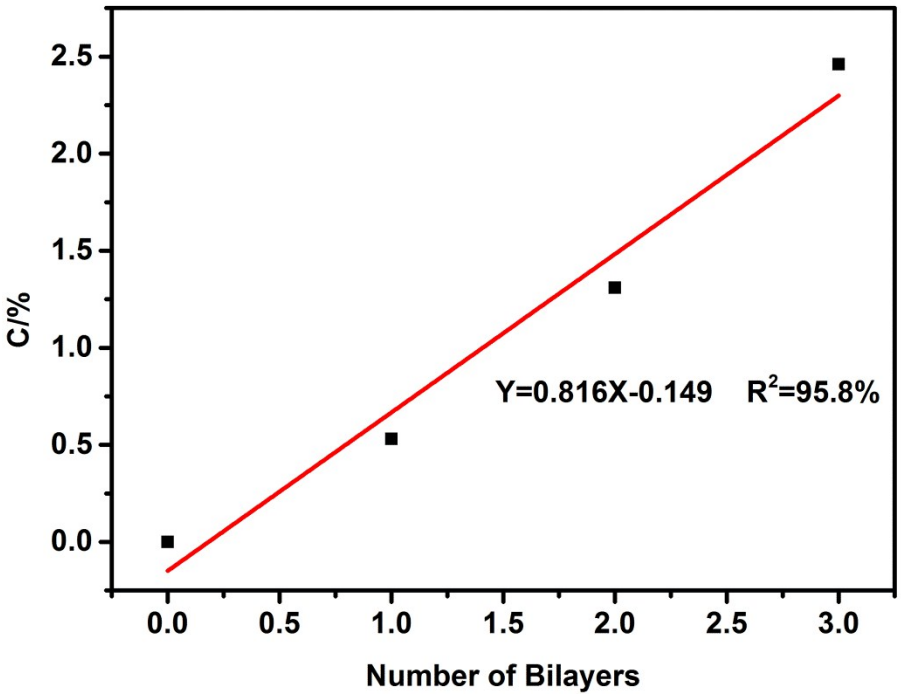

Figure S2. Carbon contents of multilayers versus the number of bilayers.

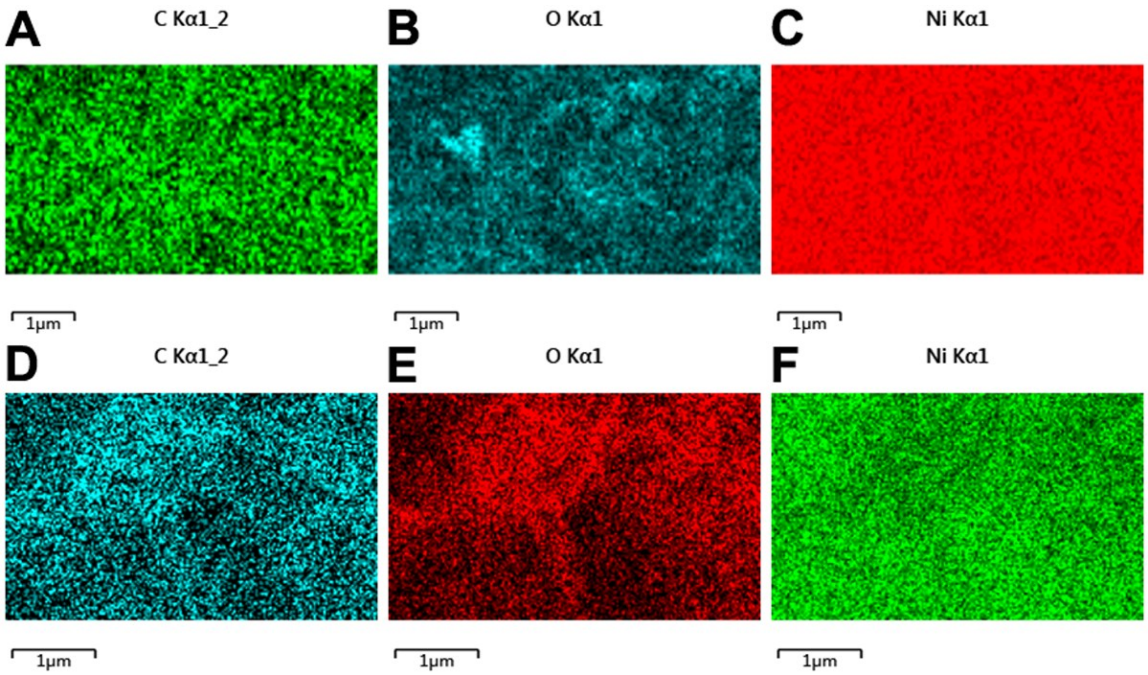

Figure S3. EDX mapping of representative areas in NF@(PEI/RGO)$_2$ (A, B and C) and NF@(PEI/RGO)$_3$ (D, E and F) obtained during FESEM imaging.

Table S1. Calculated ratios of C=O to C-O for RGO reduced in multilayers and in solution.

Catalyst	NF@(PEI/RGO)$_1$	NF@(PEI/RGO)$_2$	NF@(PEI/RGO)$_3$	RGO in solution
C=O/C-O	1.49	1.69	2.00	0.55

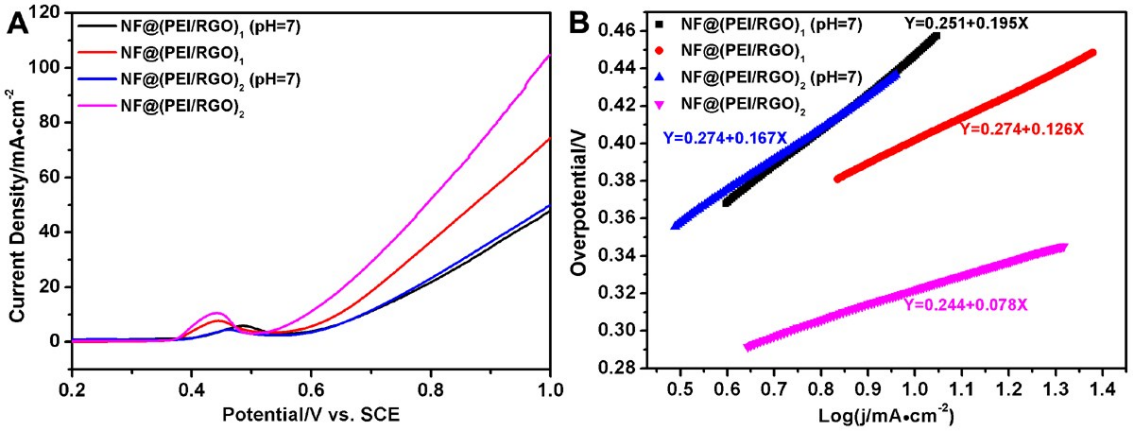

Figure S4. Polarization curves (without iR correction) (A) and Tafel plots (B) of NF@(PEI/RGO)$_1$ (pH=7), NF@(PEI/RGO)$_1$, NF@(PEI/RGO)$_2$ (pH=7), and NF@(PEI/RGO)$_2$ in 0.1 M KOH.

Table S2. The catalytic performance of NF@(PEI/RGO)$_1$ (pH=7), NF@(PEI/RGO)$_1$, NF@(PEI/RGO)$_2$ (pH=7), and NF@(PEI/RGO)$_2$ measured in 0.1 M KOH.

Electrode	Onset potential (V)	Overpotential@10.0 mA cm^{-2} (mV)	Tafel slope (mV dec^{-1})
NF@(PEI/RGO)$_1$ (pH=7)	0.62	448	195
NF@(PEI/RGO)$_1$	0.60	402	126
NF@(PEI/RGO)$_2$ (pH=7)	0.62	447	167
NF@(PEI/RGO)$_2$	0.52	322	78

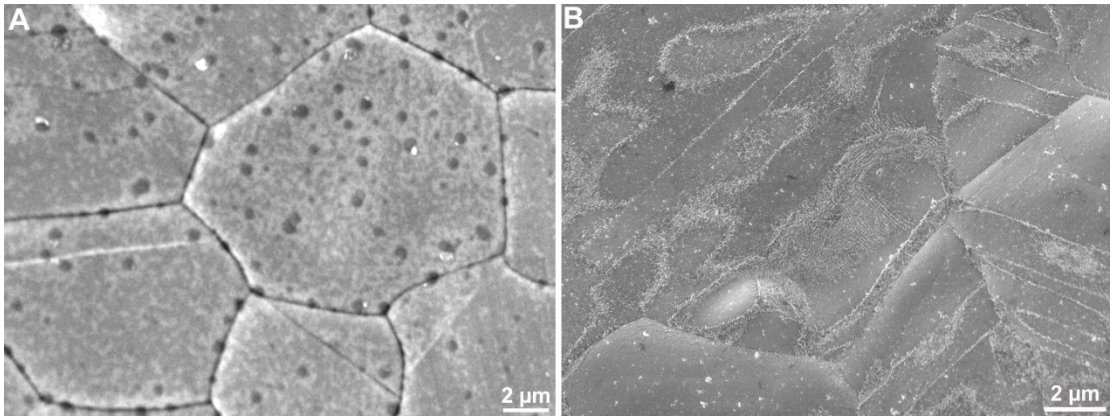

Figure S5. FESEM images of NF after chronopotentiometry at a current density of 10 mA cm^{-2} for 18.8 h (A) and 350 cycles of CV measurement (B).

REFERENCES

(1) Hummers, W. S.; Offeman, R. E. Preparation of Graphitic Oxide. *J. Am. Chem. Soc.* **1958**, *80*, 1339-1339.