Electronic Supporting Information

Facile Synthesis of Nanostructured Ni/NiO/N-doped Graphene Electrocatalysts for Enhanced Oxygen Evolution Reaction

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S1 Preparation of Nickel oxide nanoparticles

160 mg of CTAB was dissolved in 6 mL of distilled water in a 100 mL beaker. D-glucose (1.2 g) was added to the clear solution and sonicated for 4 min. 0.6 g of nickel nitrate was added and sonicated for 5 min, forming a light green clear solution, then heated at 413 K until the foam was produced and stabilized (within 60-70 min). The beaker was kept in an ice bath for 30 minutes and held at room temperature for another 30 min. It was followed by carbonization at 453 K for about 6 h and calcination at 923 K for 5 h in a muffle furnace. As prepared catalysts are hereafter denoted as NiF. It was used as the substrate in the CVD for graphene growth.

Video S1: Video of the OER reaction showing the rigorous oxygen evolution from the NiFL electrode at 20 mA/cm^2

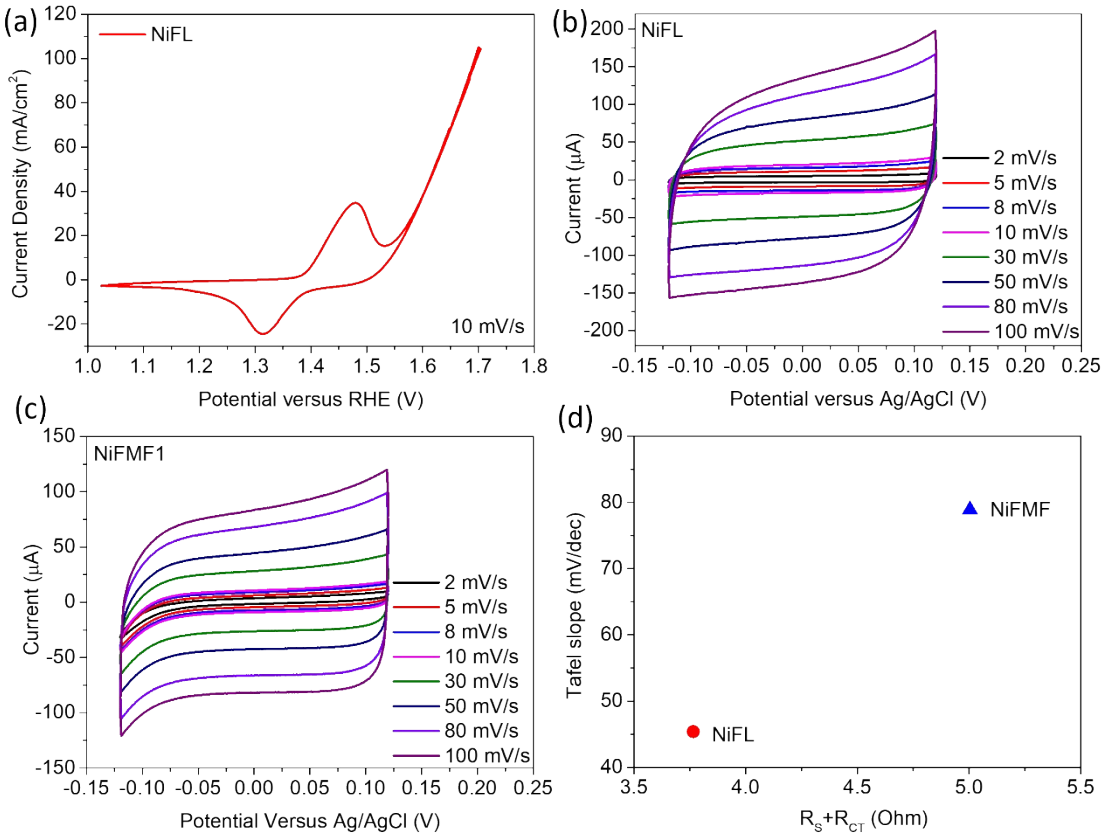

Figure S1: (a) CV curve of NiFL at 10 mV/s in 1 M KOH, CV in the non-faradic region for (b) NiFL (c) NiFMF at different scan rates ranging between 2-100 mV/s, (d) Tafel slope versus total resistance for the studied materials.

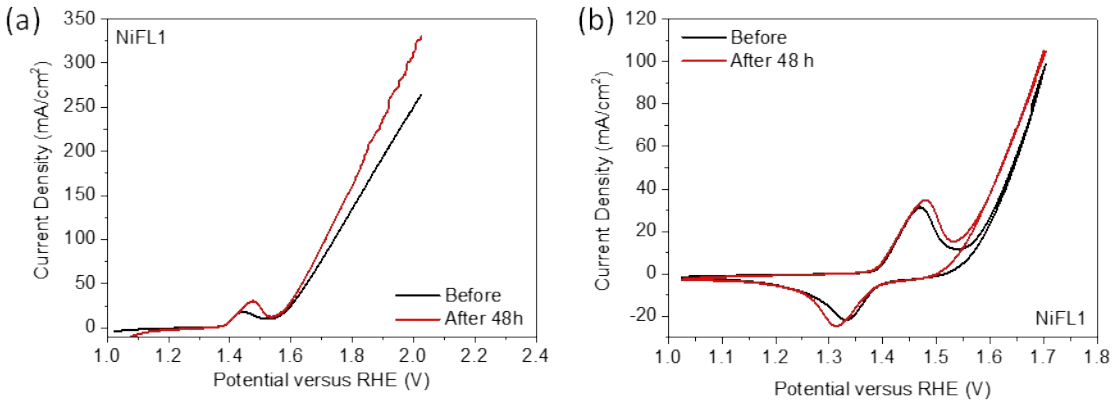

Figure S2: The (a) LSV and (b) CV measurements at 10 mV/s recorded during the stability studies for NiFL1 before and after 48 h of testing.

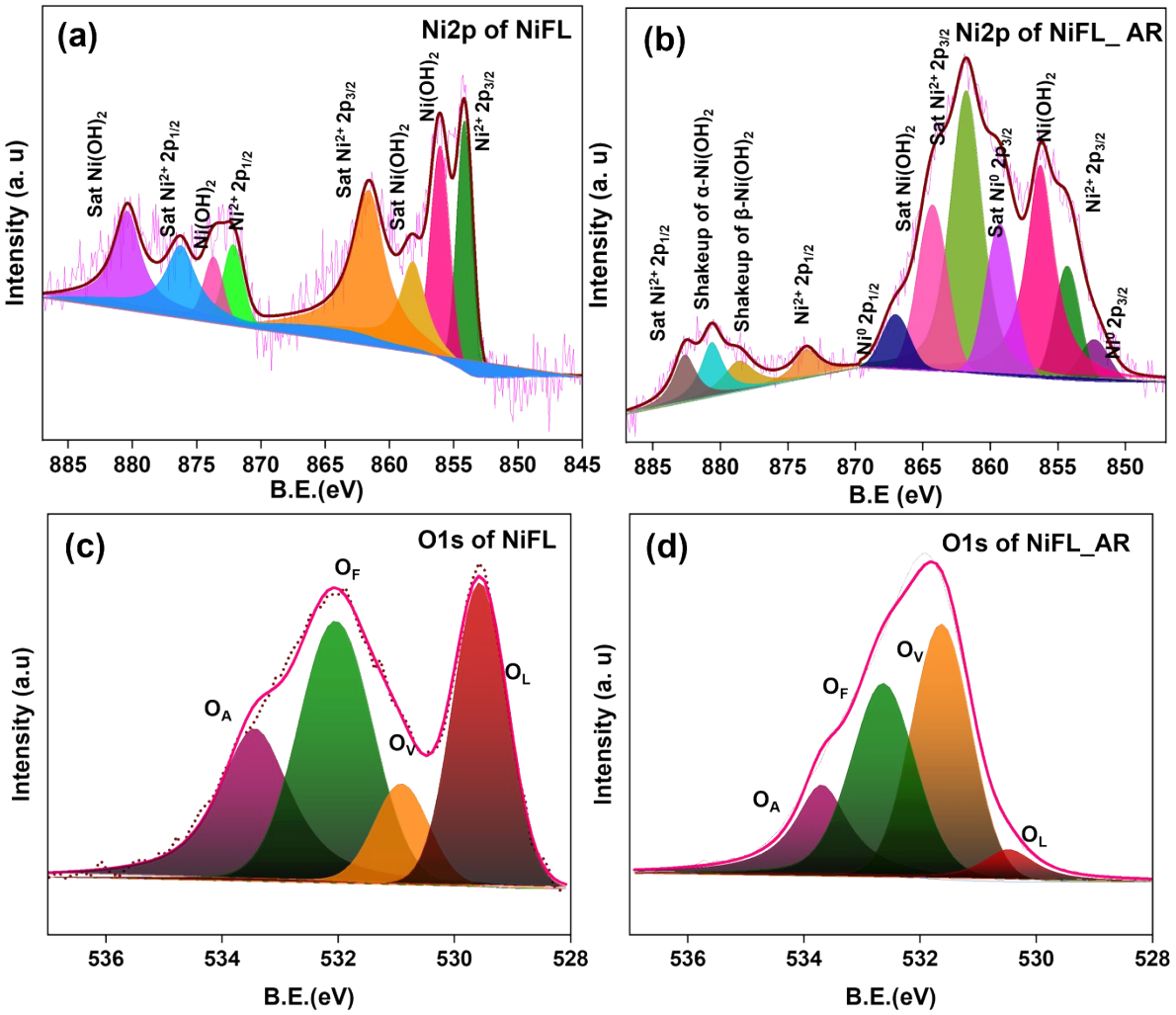

Figure S3: The deconvoluted XPS spectra of Ni2p (panel a) and O1s (panel c) of freshly prepared NiFL. Deconvoluted XPS spectra of Ni2p (panel b) and O1s (panel d) of NiFL after 48 h.

Table S1: Comparison of B.E. values of Ni 2p for catalysts of similar composites

Sl no	Material	B. E of $Ni^{2+}2p_{3/2}$(NiO)	B. E of $Ni^{2+}2p_{3/2}$(NiO)	B. E of $Ni^{2+}2p_{1/2}$(NiO)	Reference
1	NiO	853.7	855.4	864	1
2	Ni/NiO	853.6	855.4	871.1	2
3	Ni/NiO/N-doped activated carbon	854	855.8	871.5	3
4	Ni @ NiO/N-C nanowires	854.5	855.9	871.7	4
5	Ni-NiO@3-Dimensional hierarchial porous graphene	854.8	856.6	874.1	5
6	Ni/NiO/N-doped graphene	854.6	856.2	872.6	This work

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