

## Nitrogen-doped carbon flowers with Fe and Ni dual metal centers for effective electroreduction of oxygen in alkaline media

Rene Mercado, Forrest Nichols, and Shaowei Chen\*

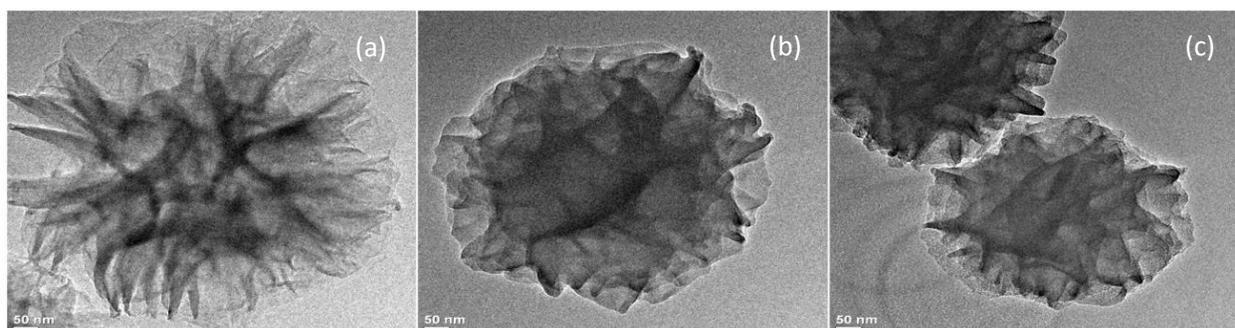
Department of Chemistry and Biochemistry, University of California, 1156 High Street, Santa Cruz, California 95064, United States. \* E-mail: shaowei@ucsc.edu

**Table S1. Elemental compositions of the sample series from XPS measurements.**

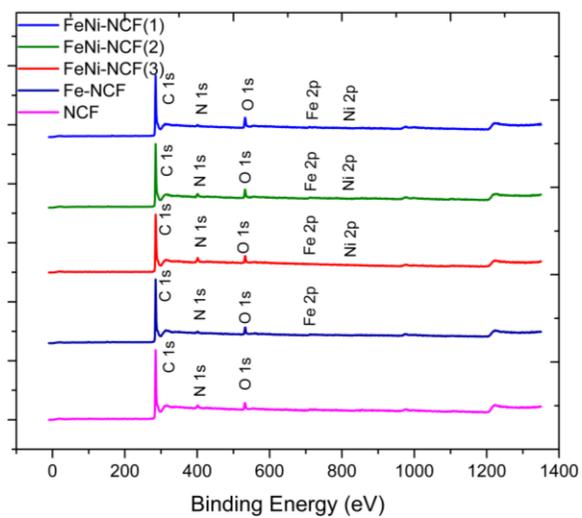
Sample	C	N	Fe	Ni	O	Metal %	Fe/Ni Ratio
NCF	90.1	6.2		-	3.70		-
Fe-NCF	92.2	2.28	0.15	-	-	0.15	-
FeNi-NCF(1)	90.6	2.21	0.13	0.13	6.97	0.26	1.0
FeNi-NCF(2)	89.5	4.09	0.18	0.091	6.10	0.27	2.0
FeNi-NCF(3)	91.3	4.10	0.17	0.049	4.41	0.22	3.5

**Table S2. Binding energies of Fe and Ni in the sample series from XPS measurements.**

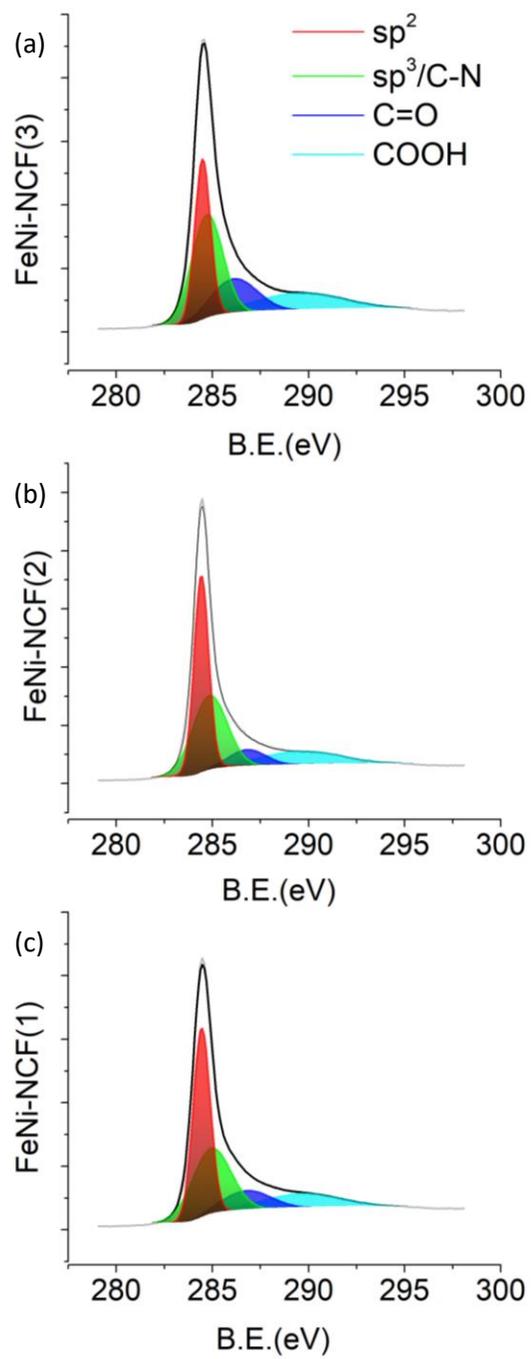
Sample	Fe (B.E.)	Ni (B.E)
NCF	-	-
Fe-C	710.11	-
FeNi-NCF(1)	710.43	854.45
FeNi-NCF(2)	710.11	854.61
FeNi-NCF(3)	709.58	854.69



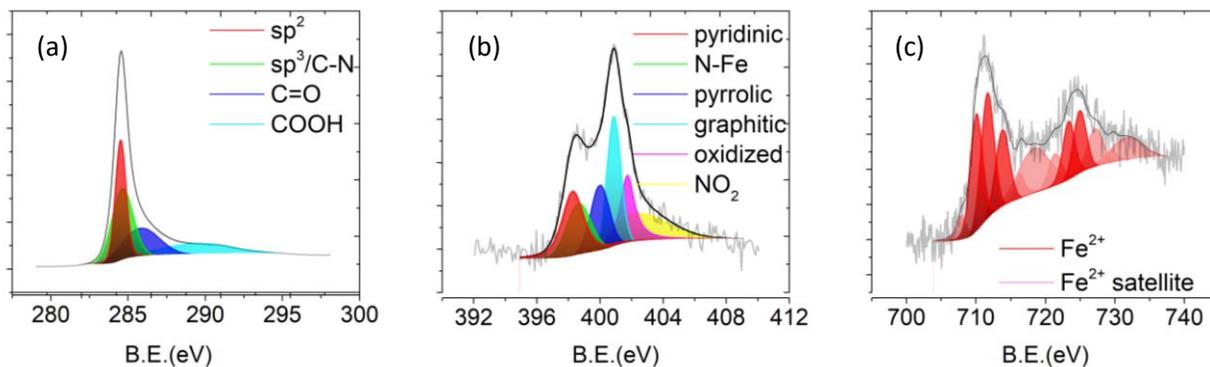
**Figure S1.** TEM images of (a) PACN-70, (b) PACN-230, and (c) NCF.



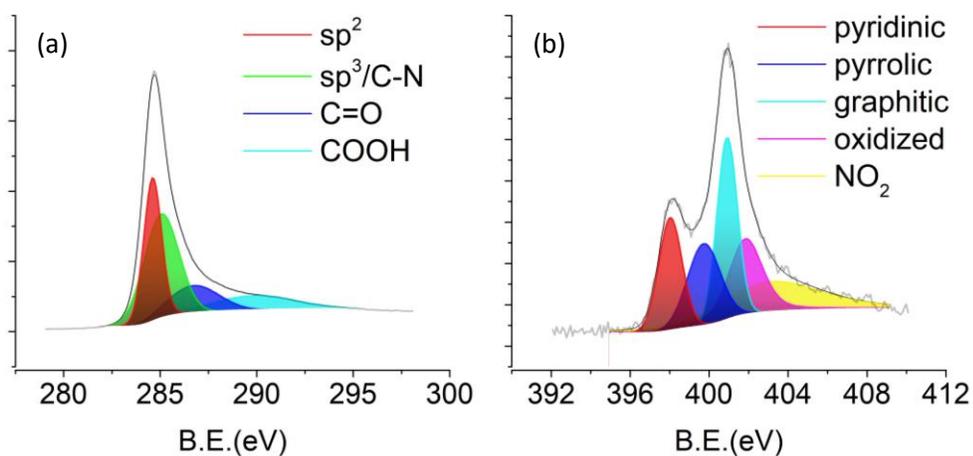
**Figure S2.** XPS survey spectra of FeNi-NCF(1), FeNi-NCF(2), FeNi-NCF(3), and NCF.



**Figure S3.** High-resolution C 1s spectra of the series of FeNi-NCF samples.



**Figure S4.** High-resolution scans of the (a) C 1s, (b) N 1s, and (c) Fe 2p electrons of Fe-NCF.



**Figure S5.** High-resolution XPS scans of the (a) C 1s and (b) N 1s electrons of NCF.