

Supporting Information

Single-Step Electrodeposited Molybdenum Incorporated Nickel Sulfide Thin Films from Low-Cost Precursors as Highly Efficient Hydrogen Evolution Electrocatalysts in Acid Medium

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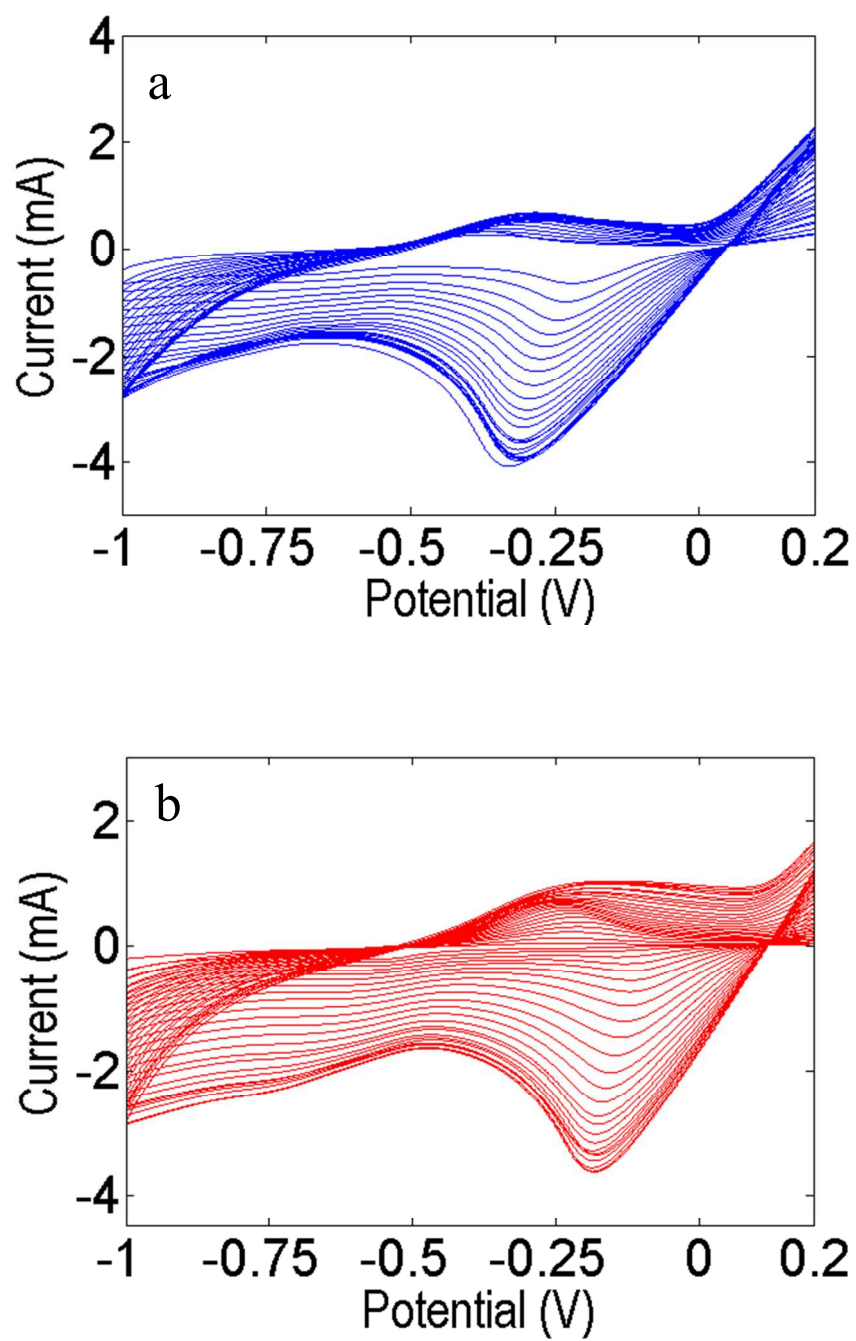


Figure S1. Typical deposition of a) NiS and b) Ni_{0.96}Mo_{0.04}S thin films on to FTO plates. Scan rate = 0.005 V/s; Cycles = 25.

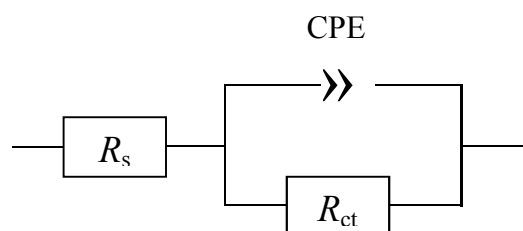


Figure S2. A simple Randles equivalent circuit with a constant phase element (CPE) replacing the double layer capacitance.

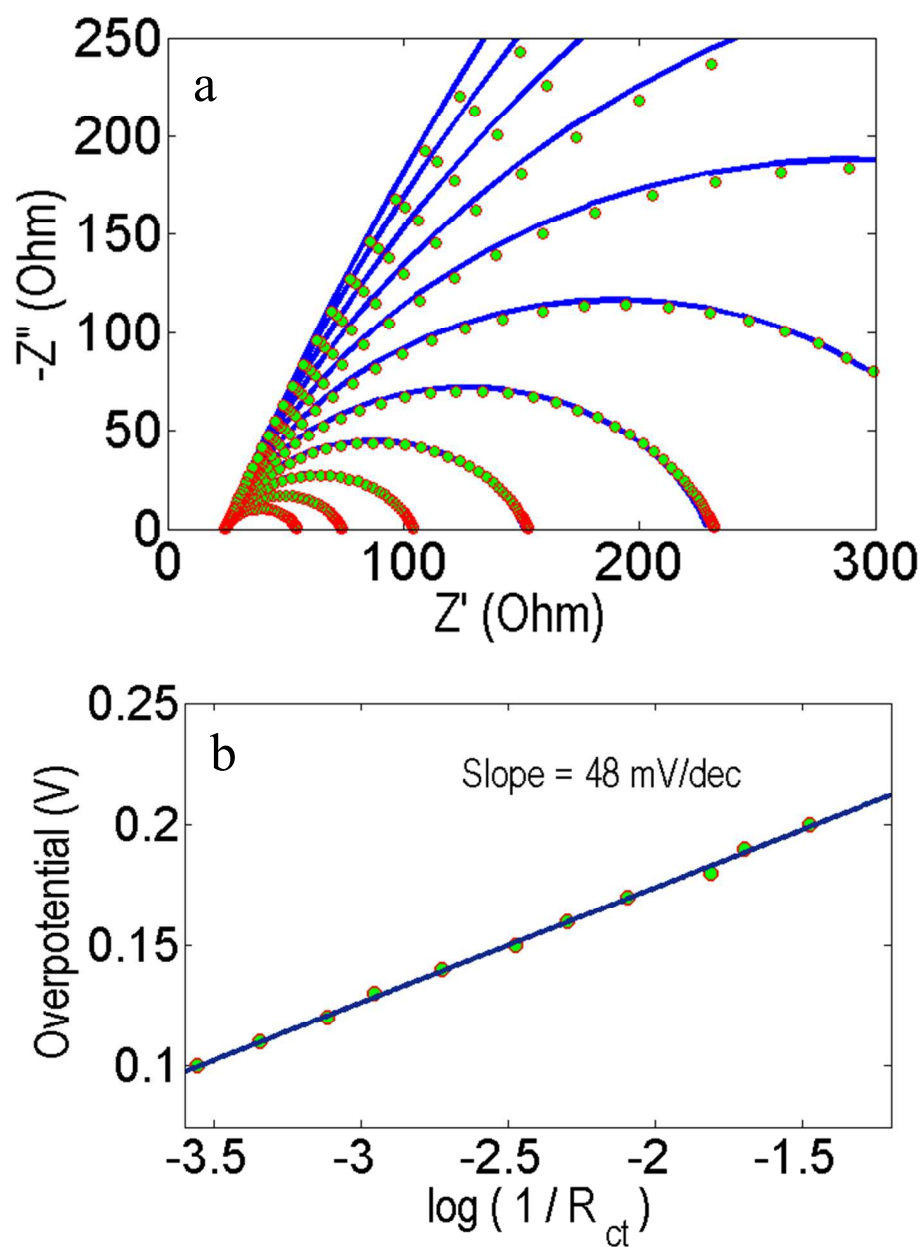


Figure S3. a) Nyquist plots of $\text{Ni}_{0.92}\text{Mo}_{0.08}\text{S}$ thin film as a function of η from 0.2 V (smallest semi-circle) to 0.1 V (largest semi-circle) in increments of 0.01 V. Solid lines denote experimental data while circles represent fitting. b) Tafel plot of $\text{Ni}_{0.92}\text{Mo}_{0.08}\text{S}$ thin film obtained employing R_{ct} data from the Nyquist plot.

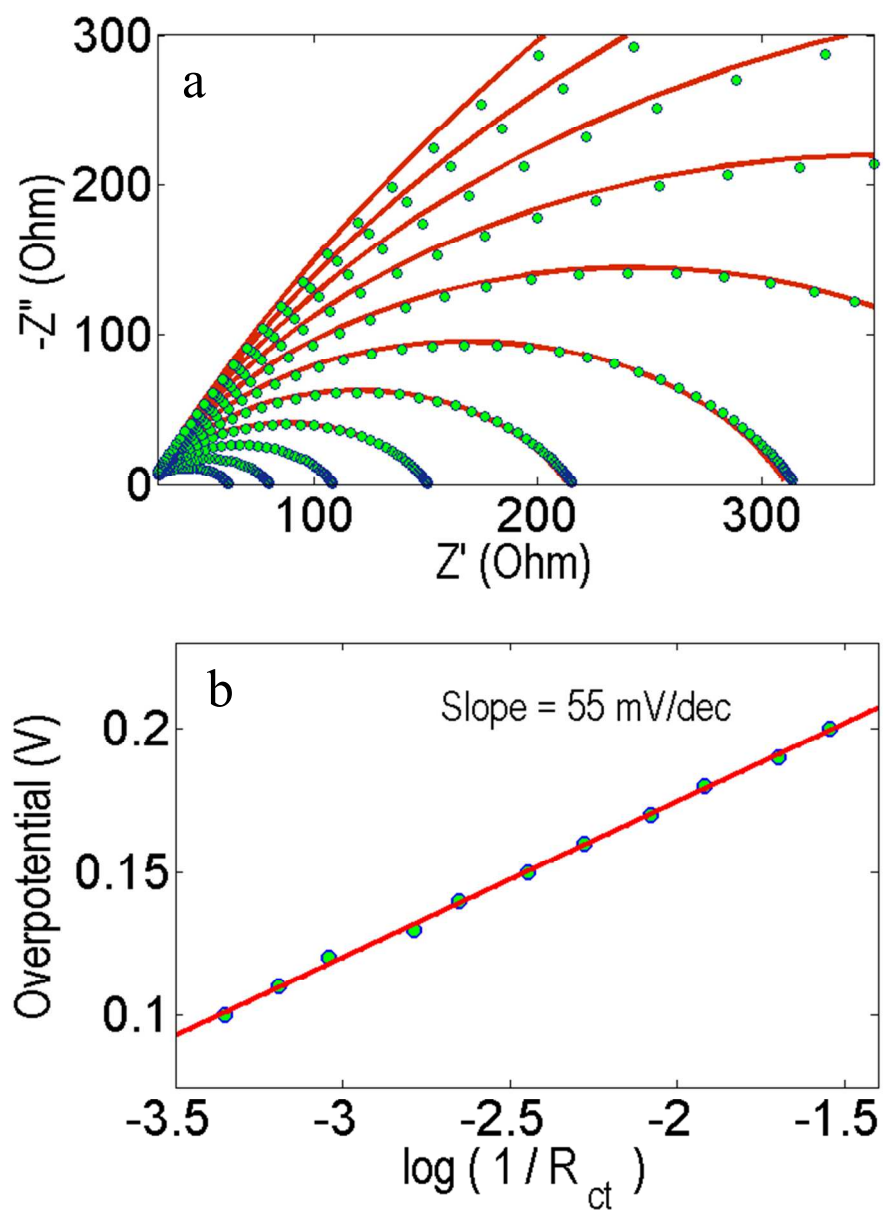


Figure S4. a) Nyquist plots of $\text{Ni}_{0.84}\text{Mo}_{0.16}\text{S}$ thin film as a function of η from 0.2 V (smallest semi-circle) to 0.1 V (largest semi-circle) in increments of 0.01 V. Solid lines denote experimental data while circles represent fitting. b) Tafel plot of $\text{Ni}_{0.84}\text{Mo}_{0.16}\text{S}$ thin film obtained using R_{ct} data from the Nyquist plot.

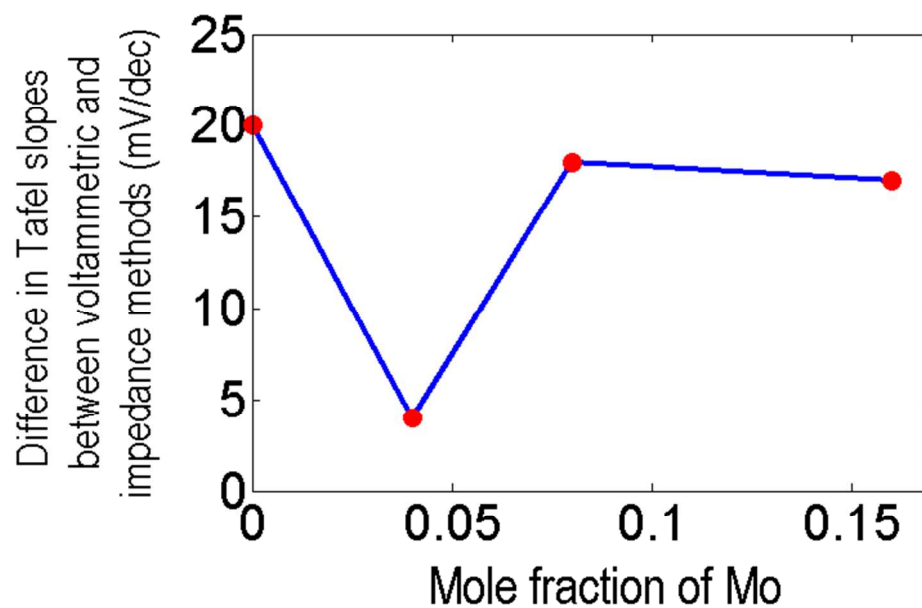


Figure S5. Difference in Tafel slopes between voltammetric and impedance methods as a function of mole fraction of Mo.

Table S1. Mo/Ni molar ratios of various $\text{Ni}_{1-x}\text{Mo}_x\text{S}$ ($x \neq 0$) samples determined by EDXS and ICP-OES analyses.

Sample	EDXS	ICP-OES
$\text{Ni}_{0.96}\text{Mo}_{0.04}\text{S}$	0.04 ± 0.01	0.04 ± 0.01
$\text{Ni}_{0.92}\text{Mo}_{0.08}\text{S}$	0.08 ± 0.01	0.09 ± 0.02
$\text{Ni}_{0.84}\text{Mo}_{0.16}\text{S}$	0.17 ± 0.02	0.19 ± 0.02

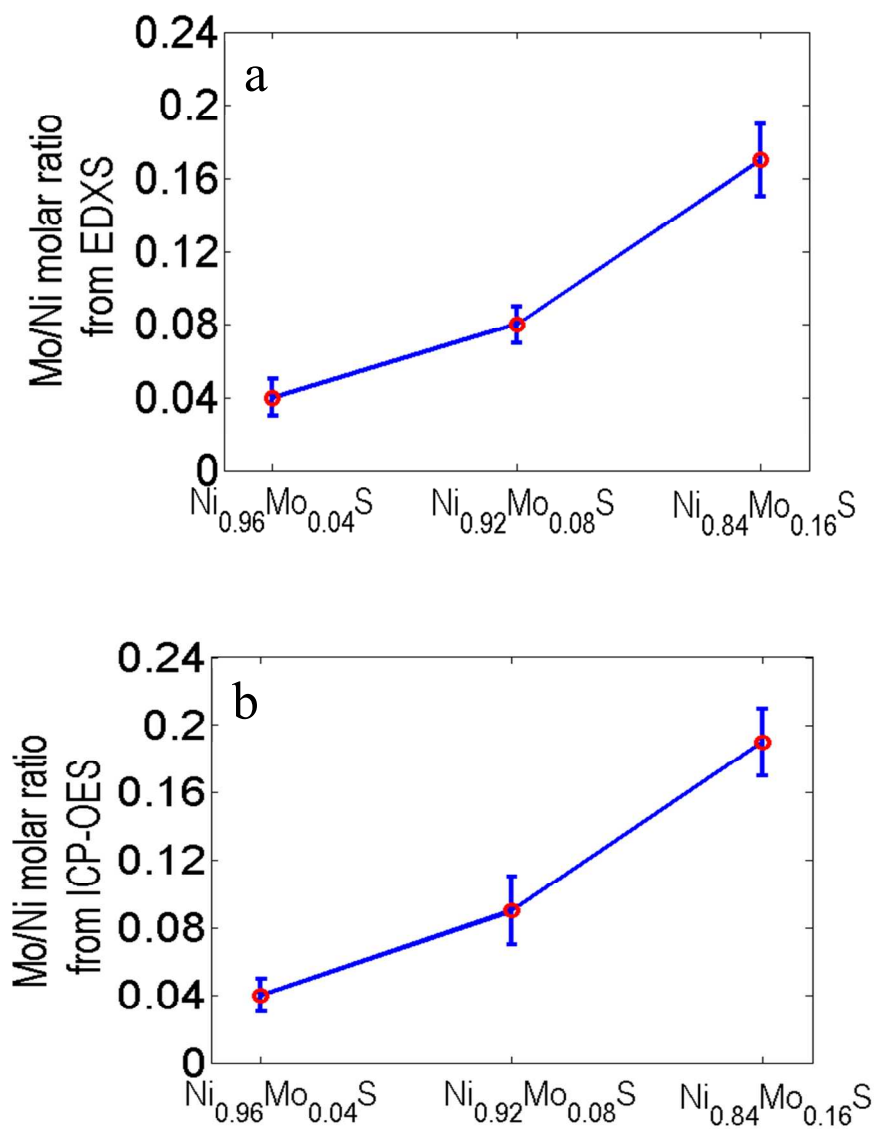


Figure S6. Error bar plots showing Mo/Ni molar ratio for various $\text{Ni}_{1-x}\text{Mo}_x\text{S}$ ($x \neq 0$) obtained from a) EDXS and b) ICP-OES.