Efficient amplification strategy for N-doped NiCo$_2$O$_4$ with oxygen vacancies and partially Ni/Co-nitrides as a dual-functional electrode for both supercapattery and hydrogen electrocatalysis

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Fig. S1. XRD patterns of pristine NCO and N-doped NCO electrodes. Symbols indicate diffraction peaks from Ni- (JCPDS No.10-0280) and Co-nitrides (JCPDS No. 15-0806).
Fig. S2. XPS survey spectra of pristine NCO and N-doped NCO electrodes.
Fig. S3. High resolution XPS O 1s spectra of pristine NCO and N-doped NCO electrodes.
Fig. S4. CV curves of pristine NCO and N-doped NCO electrode at various scan rates.
Fig. S5. GCD curves of pristine NCO and N-doped NCO electrode at various current densities.
Fig. S6. Plot of potential drop vs. applied current density.
Fig. S7. Plot of Rct vs. nitrided Ni/Co content.
Fig. S8. The potential difference ($\Delta E = E_{40mA\cdot cm^2} - E_{10mA\cdot cm^2}$) of pristine NCO and N-doped NCO electrodes.
Fig. S9. Comparison of calculated exchange current densities to measured values.
Fig. S10. (a) SEM images of NCO electrodes before and after 100,000 s stability test.
**Fig. S11.** $C_{dl}$ measurement linear fitting of the capacitive currents against the scan rate to fit a linear regression.