Supporting Information

Coalescence in Hybrid Materials: The Key to High-Capacity Electrodes

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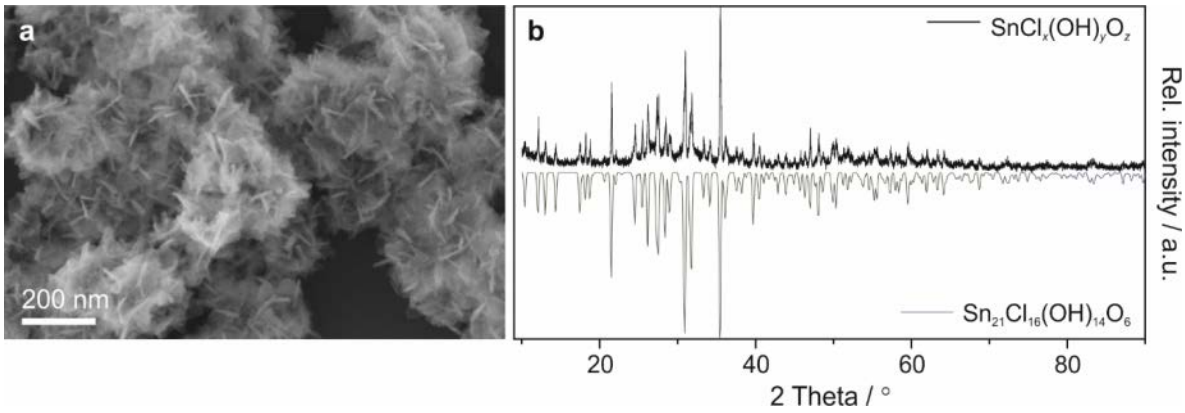

Figure S1. (a) SEM image showing small platelets of $SnCl_x(OH)_yO_z$ together with (b) a measured XRD pattern of $SnCl_x(OH)_yO_z$ (top) and simulated pattern (bottom) of $Sn_{21}Cl_{16}(OH)_{14}O_6$ (ICDD Ref Code.: 00-039-0314).

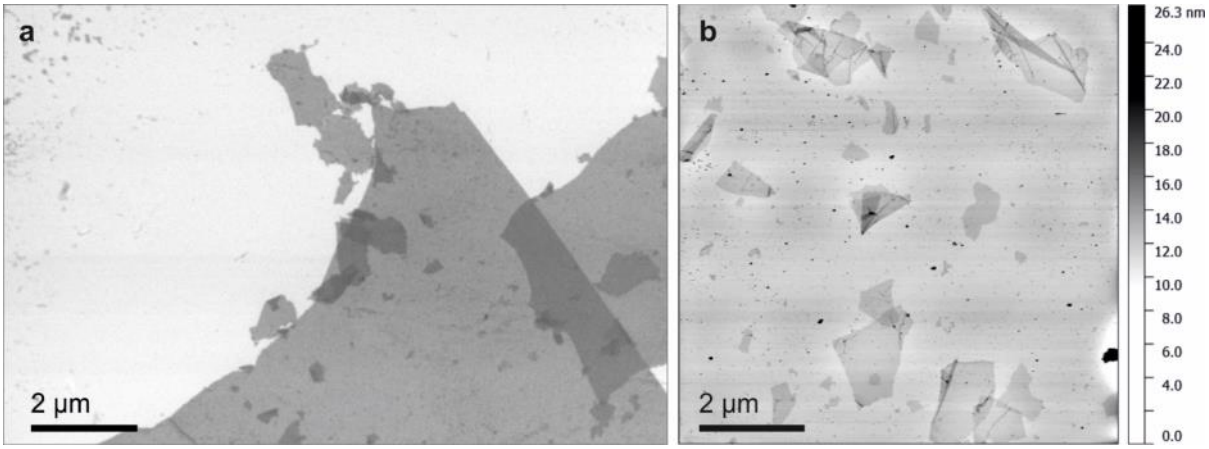

Figure S2. (a) SEM and (b) AFM images of single rGO nanosheets deposited on a Si wafer.

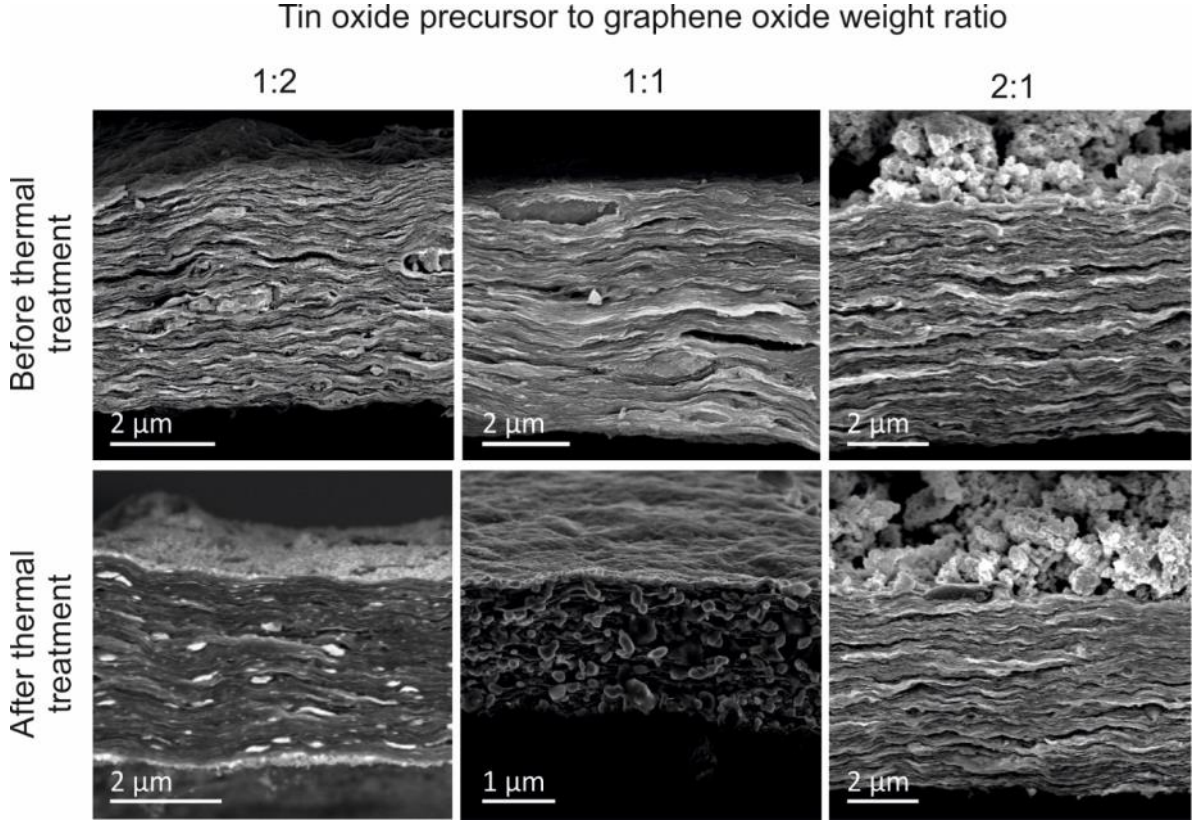

Figure S3. SEM images of hybrid papers with different compositions before and after thermal treatment.

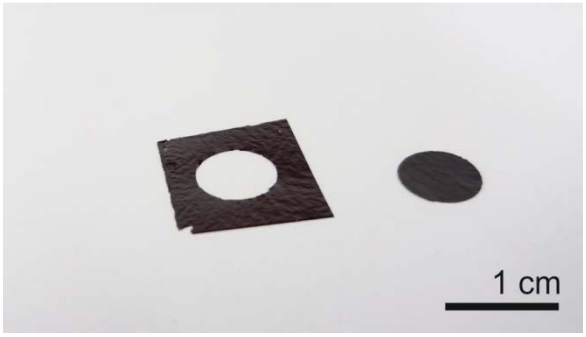

Figure S4. An 8 mm in diameter punched out disk of the electrode without any structural damages. This electrode is used as it is as binder-free anode in the Swagelok cell.

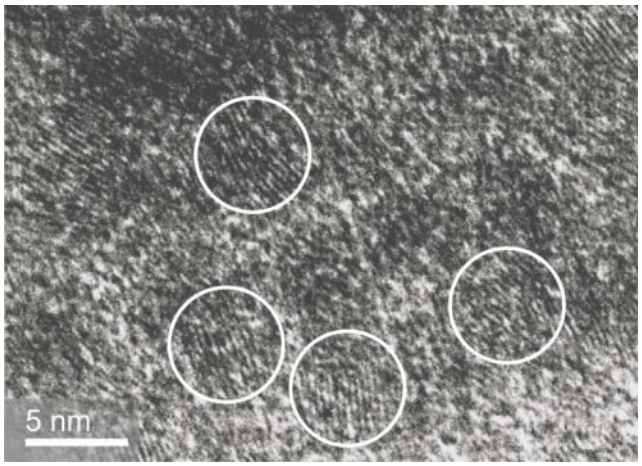

Figure S5. HRTEM image of crystals (white circle) with preferred texture on a sheet of rGO. Crystals with a size of up to 10 nm were observed.

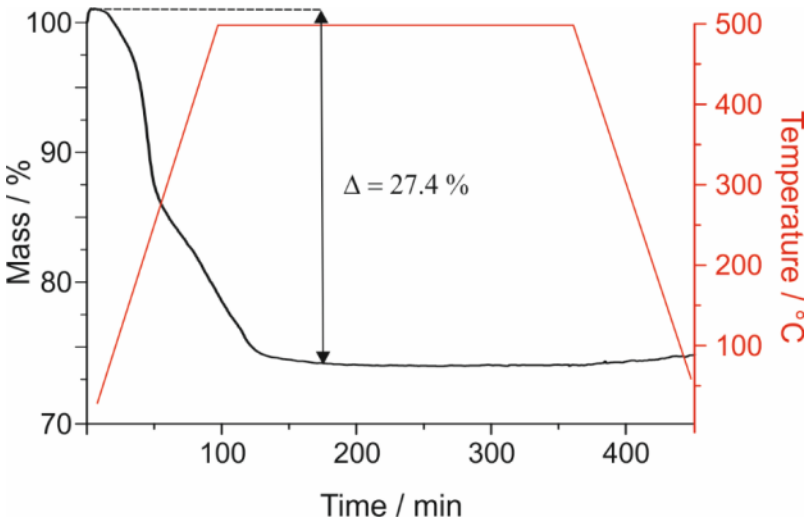

Figure S6. TGA curve displaying the annealing of the $SnCl_x(OH)_yO_z$/GO hybrid papers under argon atmosphere.

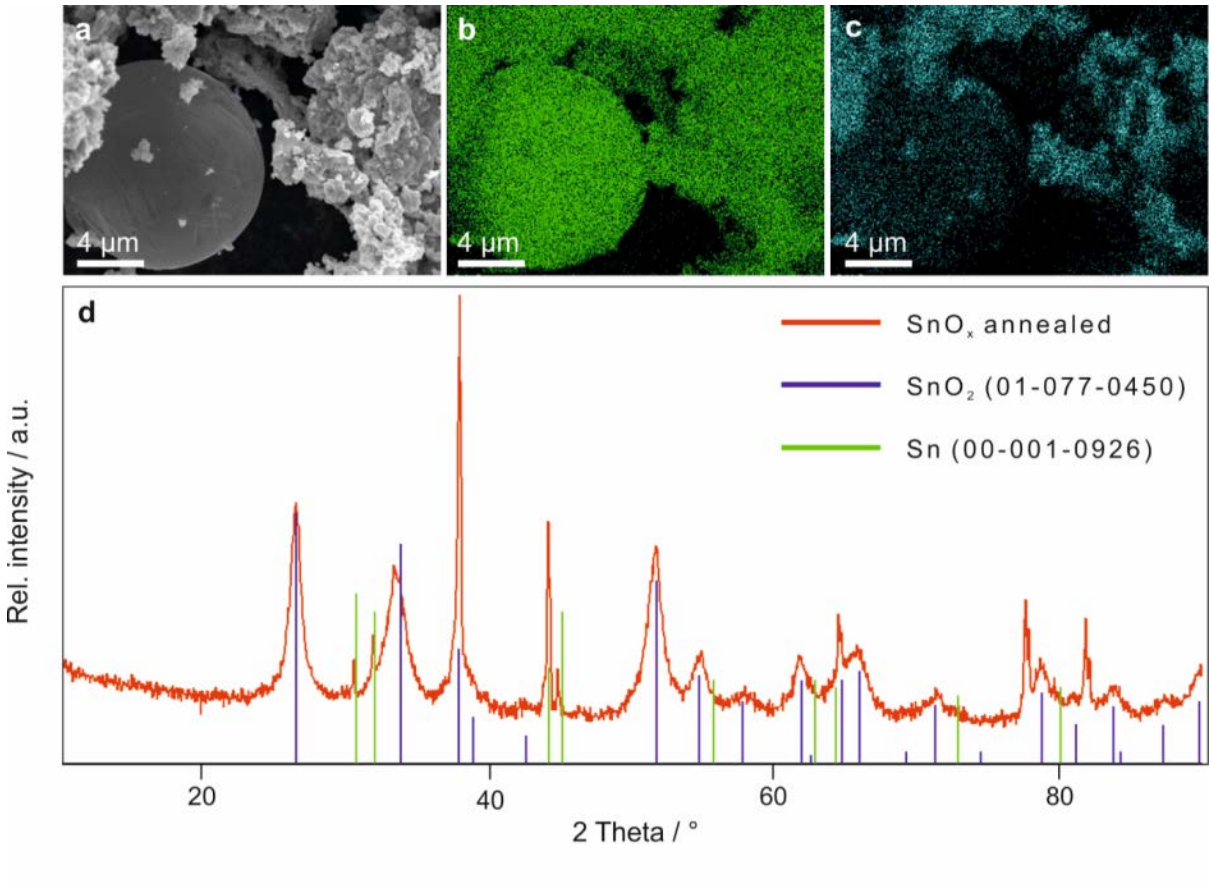

Figure S7. (a) SEM image of a selected sample area of the $SnCl_x(OH)_yO_z$ precursor, which was annealed in the absence of GO. A disproportionation of the precursor is clearly visible by comparing the EDX tin mapping (b, green) with the oxygen mapping (c, cyan). The spherical particle appears to contain only Sn, whereas increased oxygen content is observed for the surrounding agglomerates. (d) The disproportionation was additionally confirmed by the collected PXRD data, showing the presence of Sn and SnO_2. The respective ICDD data set numbers of the reference patterns are stated in the figure.

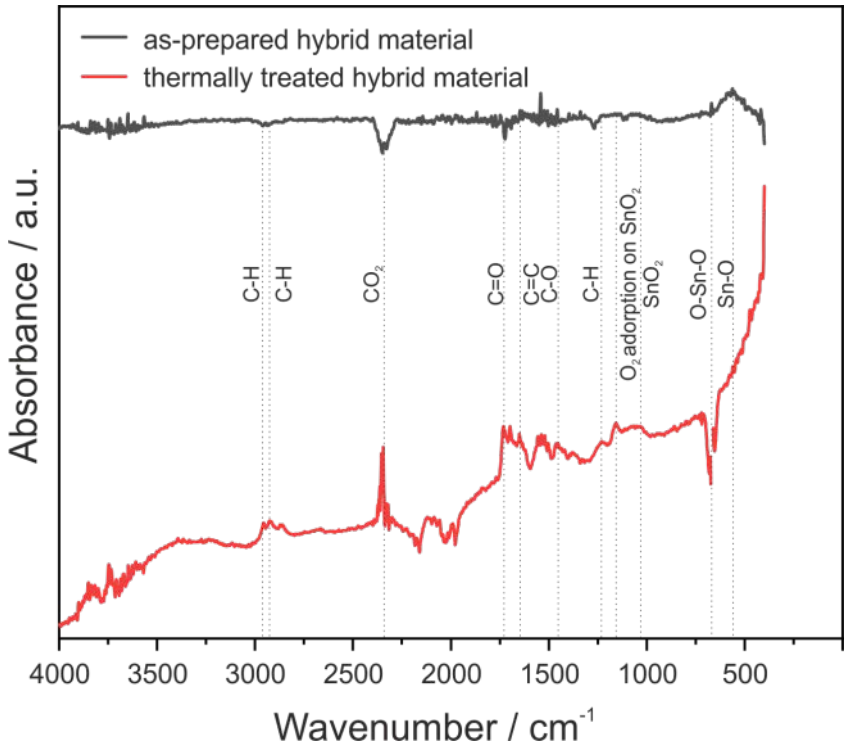

Figure S8. FTIR spectra of the hybrid paper before and after thermal treatment.

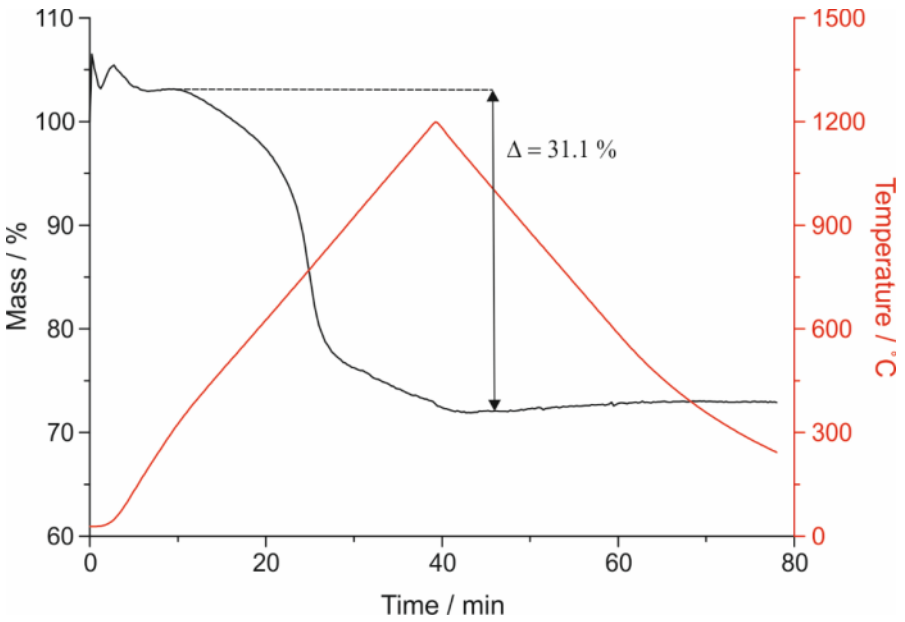

Figure S9. TGA curve displaying the annealing of the SnO_2/rGO hybrid papers in air. The measured mass loss allows calculating the final weight ratio of the two constituents.

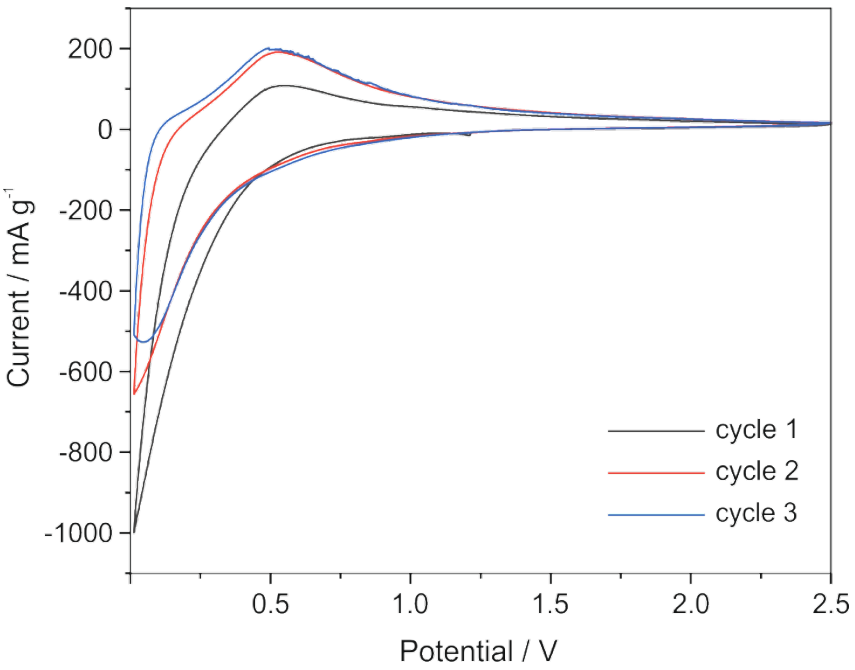

Figure S10. CV analysis of the SnO_2/r-GO paper-like hybrid material, displaying the irreversible processes occurring during the first cycles.

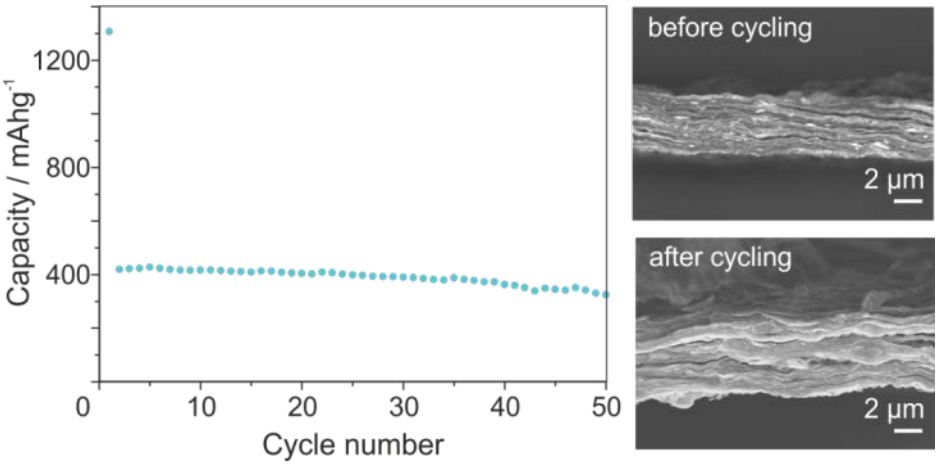

Figure S11. Measured capacity of the SnO_2/rGO electrode measured using a current rate of 200 mAh g^{-1} and a voltage window of 0.125 V and 2.7 V.