

Microstructure and electrochemical properties of high performance graphene/manganese oxide hybrid electrodes

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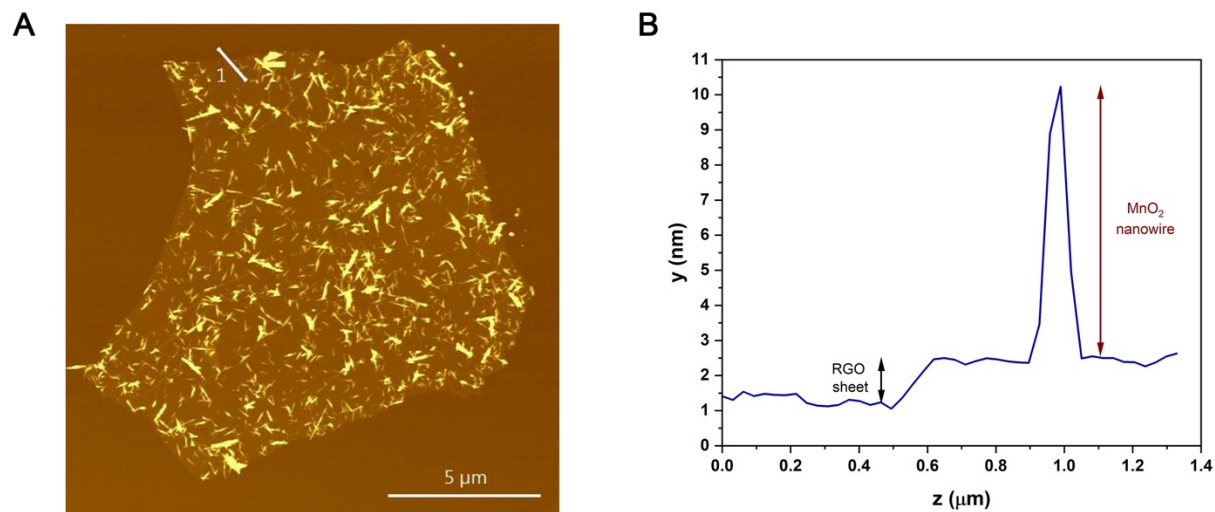


Figure S1. (a) AFM of 3H hybrid with the marking (1) near the top left of the hybrid used to analyze (b) the z-height profile where the RGO sheet diameter (thickness) is ~ 1 nm and MnO₂ nanowire diameter (thickness) is ~ 9 nm.

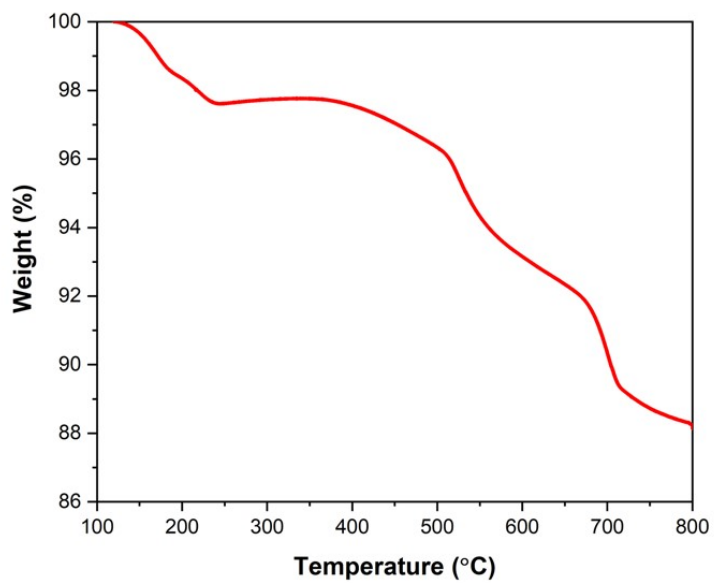


Figure S2. TGA curve of the degradation of MnO₂.

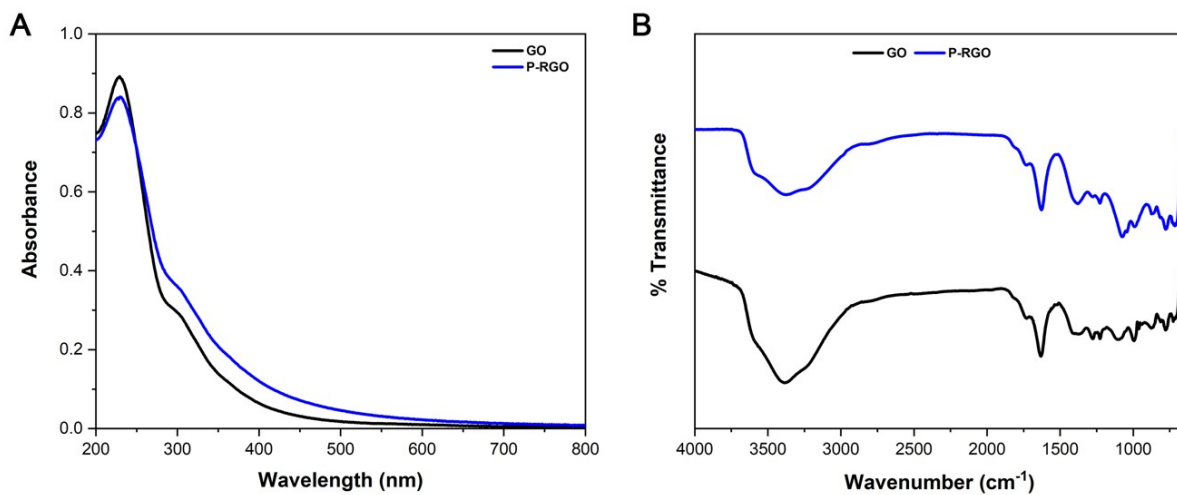


Figure S3. To analyze if the graphene oxide is reduced through the hybrid synthesis, GO was subject to the same conditions in the synthesis without addition of the reacting agent. (a) UV-vis and (b) FTIR spectroscopy were performed and demonstrate a partially reduced graphene oxide (P-RGO).

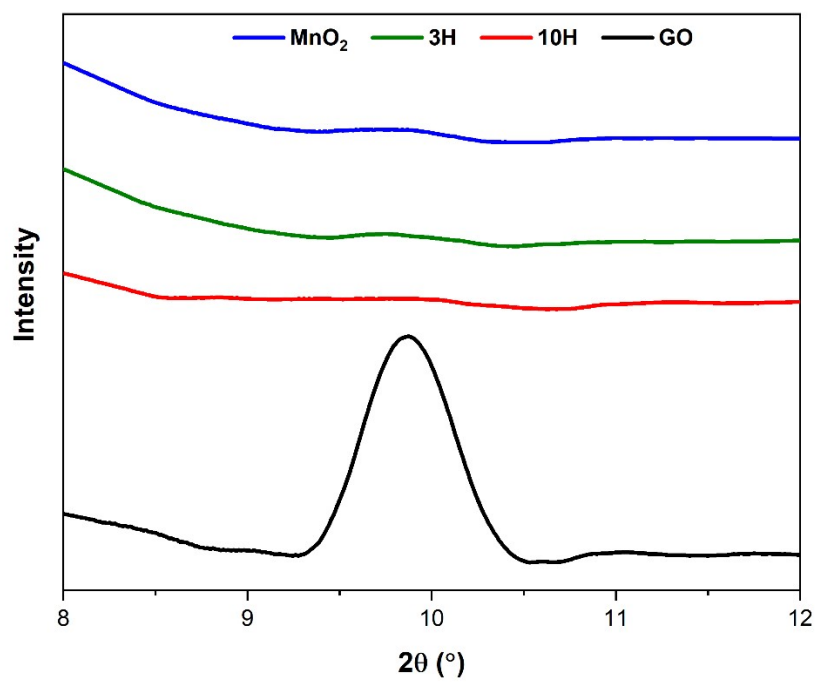


Figure S4. XRD showing the hybrids do not exhibit a peak at the low 2θ angles, suggesting the graphene oxide (GO) that goes through the hybrid synthesis results in a reduced graphene oxide (RGO) structure.

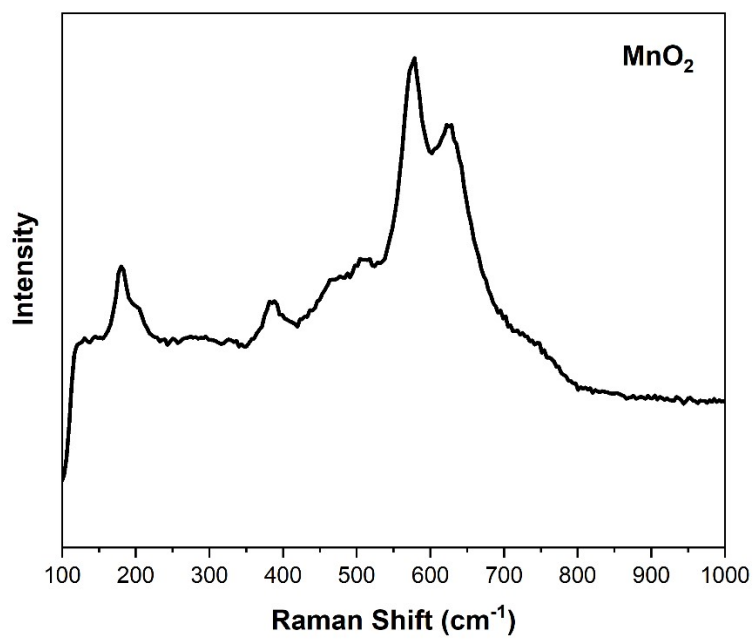


Figure S5. Raman spectrum of MnO₂ magnified at low Raman shifts.

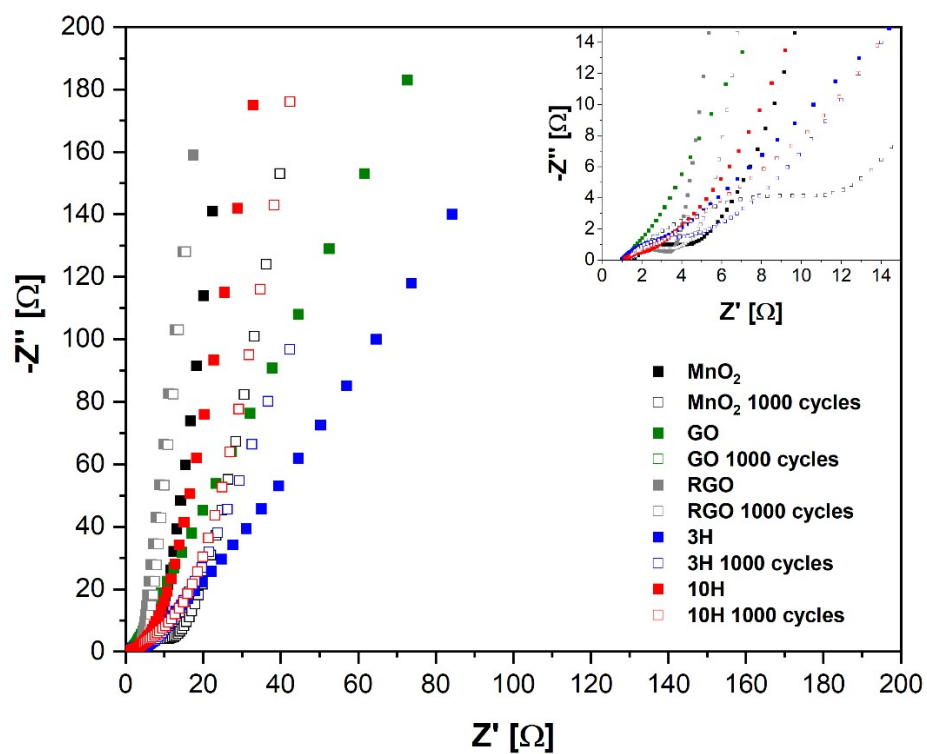


Figure S6. EIS after 1 (closed squares) and 1000 (open squares) CV cycles performed at 20 mV/s.