

Electronic Supplementary Information

***In-situ* TEM study of lithiation into PPy coated α -MnO₂/graphene foam freestanding electrode**

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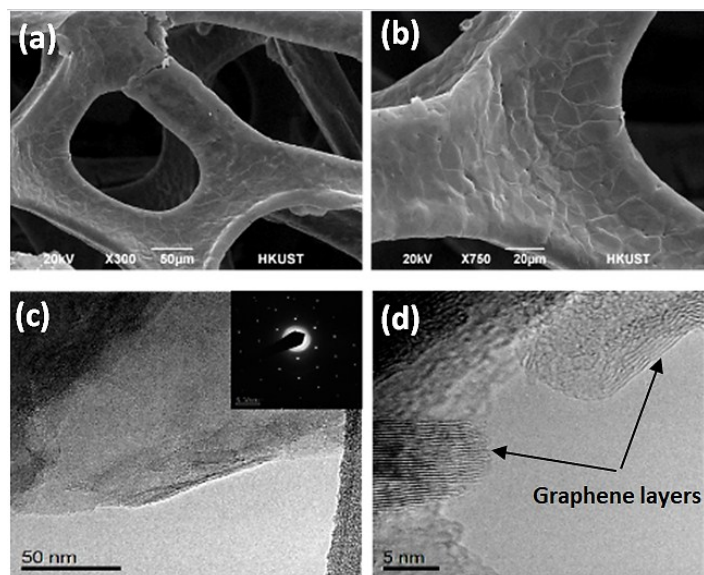


Figure S1. (a, b) SEM images of cellular-structured freestanding GF network, (c, d) TEM analysis of GF with a SAED pattern of crystallographic planes in inset.

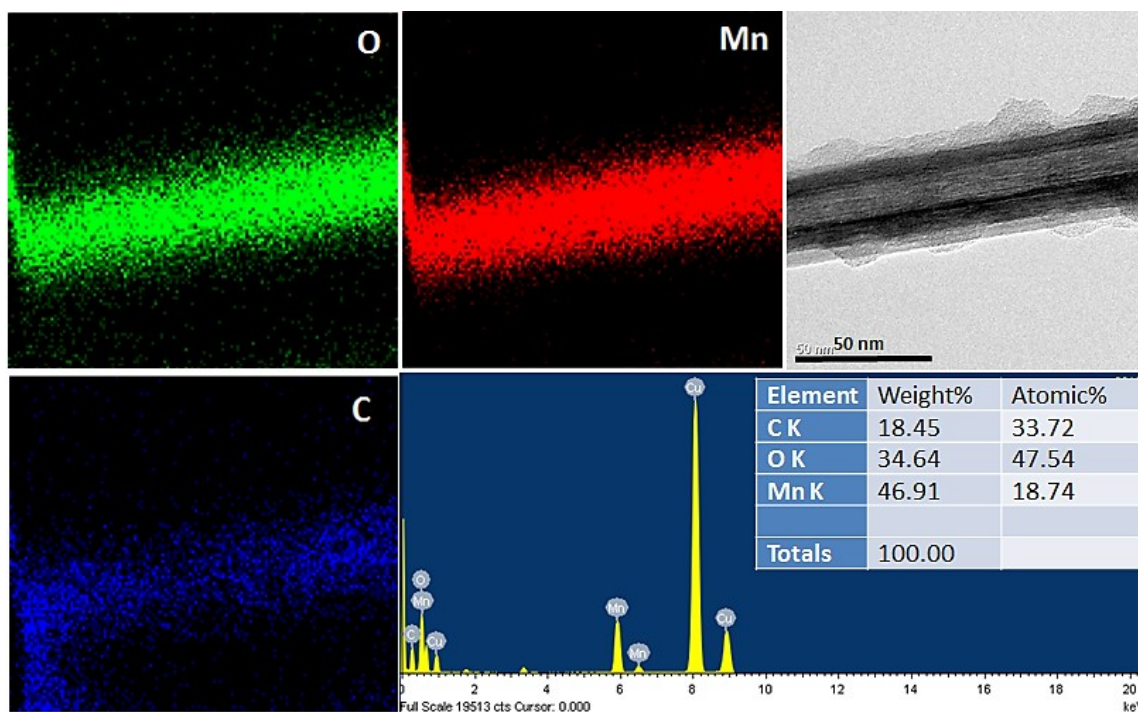


Figure S2. Elemental maps and EDS results of a MnO₂-PPy nanowire.

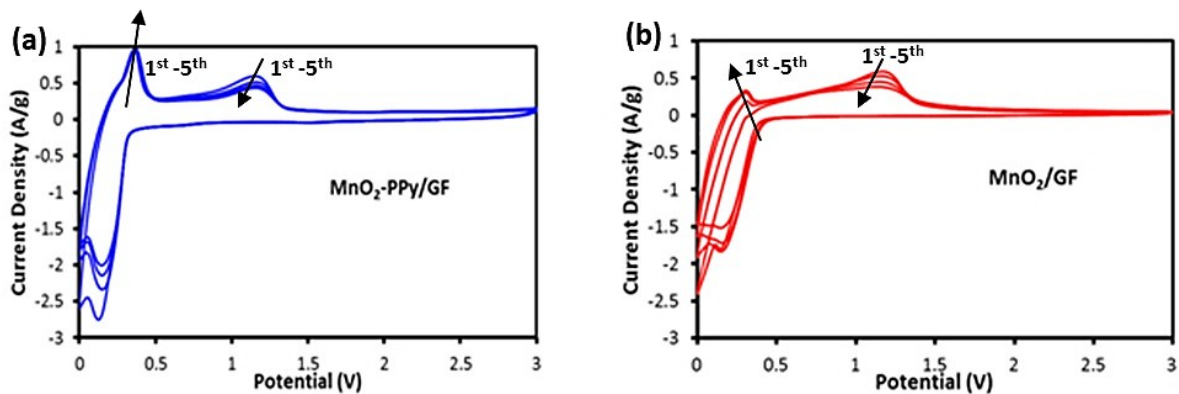


Figure S3. CV curves of (a) $\text{MnO}_2\text{-PPy/GF}$ and (b) $\text{MnO}_2\text{/GF}$ electrodes at a scan rate of 0.2 mV s^{-1} .

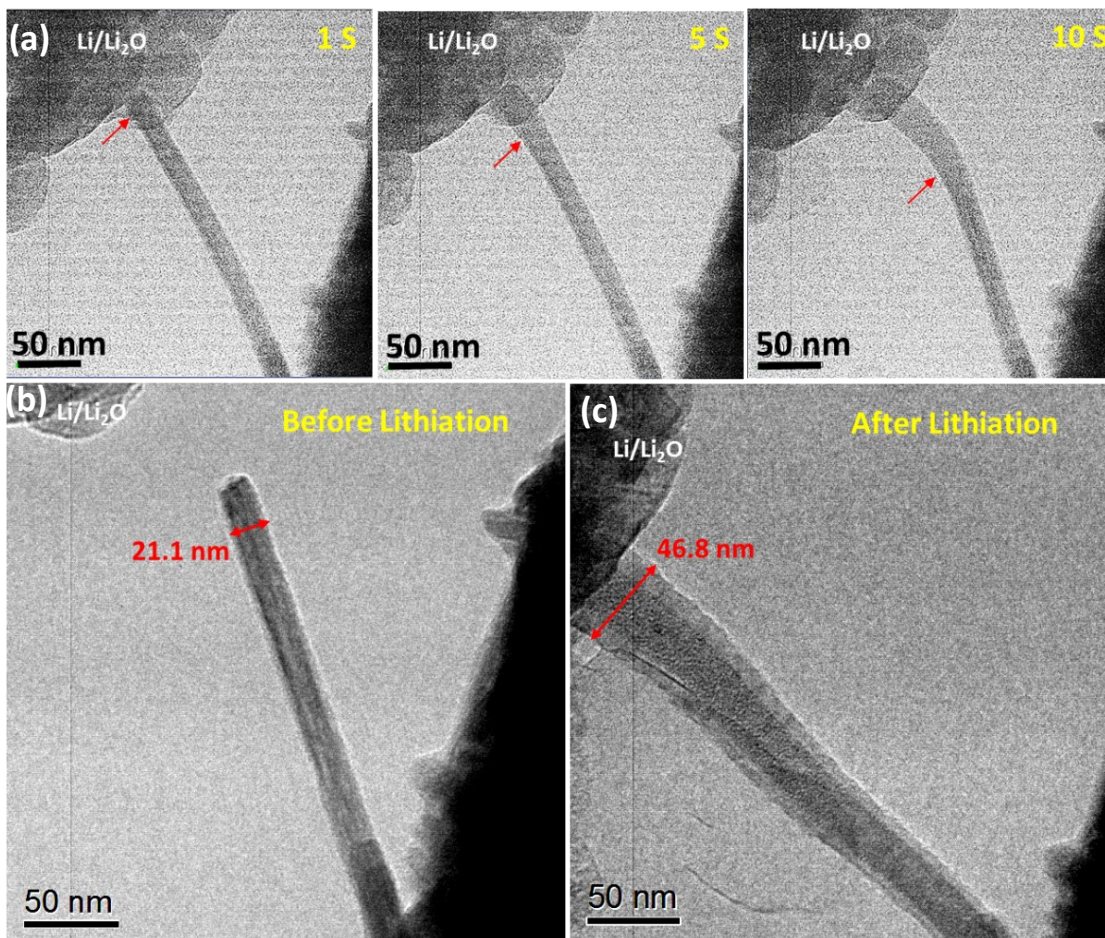


Figure S4. (a) Sequential *in situ* TEM images of the initial lithiation process of MnO_2 nanowire. TEM images of MnO_2 (b) before and (c) after complete lithiation.