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Supplementary Information for

Reversible Lithium Storage in Manganese and Cobalt 1,2,4,5-Benzenetetracarboxylate Metal-Organic Framework with High Capacity

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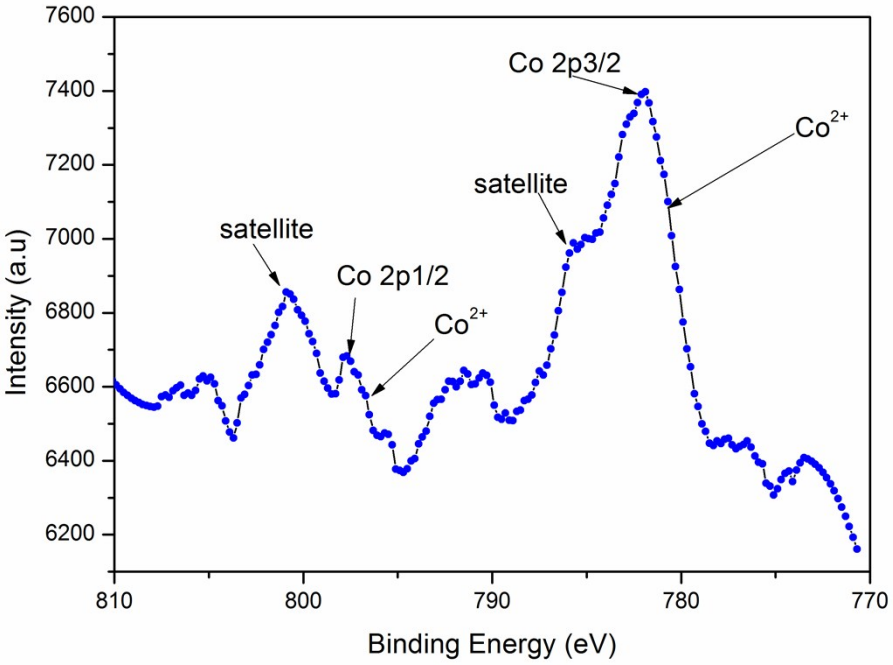

Figure S1. Co2p XPS spectra of the MnCo-BTC.

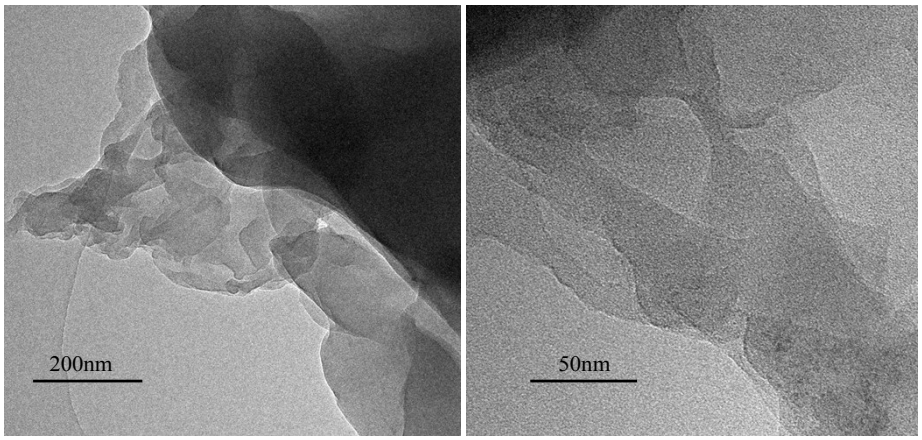

Figure S2. TEM images of MnCo-BTC

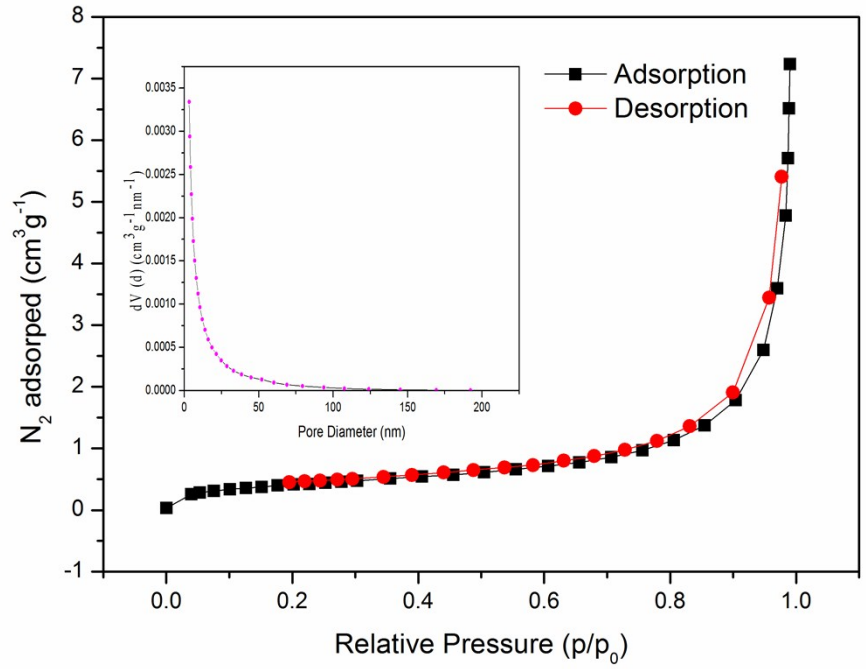

Figure S3. Nitrogen adsorption isotherms at 77 K for MnCo-BTC. Inset shows the pore size distribution from DFT calculation.

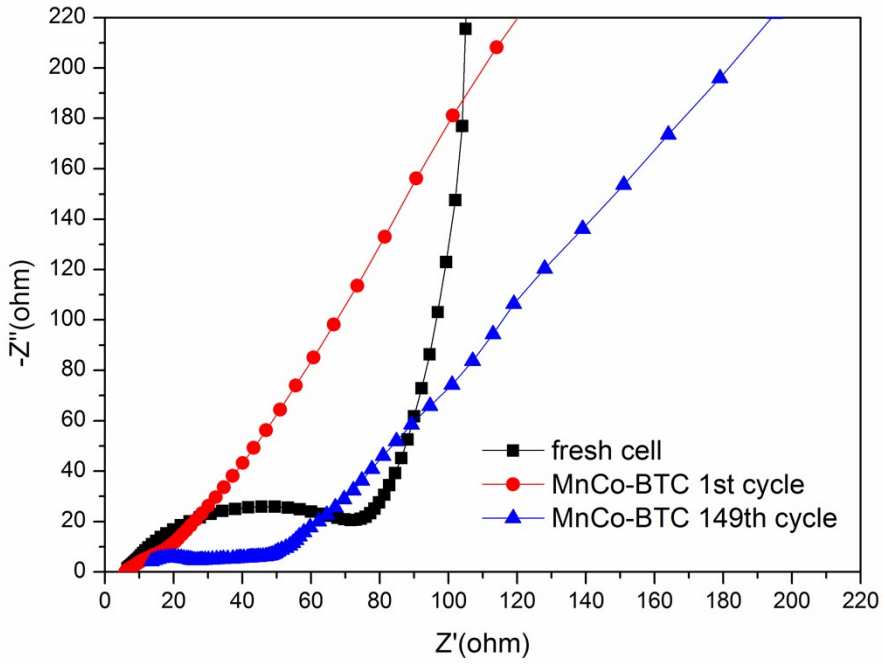

Figure S4. EIS spectra for MnCo-BTC fresh cell and MnCo-BTC at 1st and 149th cycle with a current density of 100mA g^{-1}. It could be observed that the interphase resistance decreases from the fresh cell to 1st cycle, which is due to the activation and a better wetting of the electrodes.[1,2] However, after the 149th cycle, the resistance increases, which might be due to the growth of SEI.

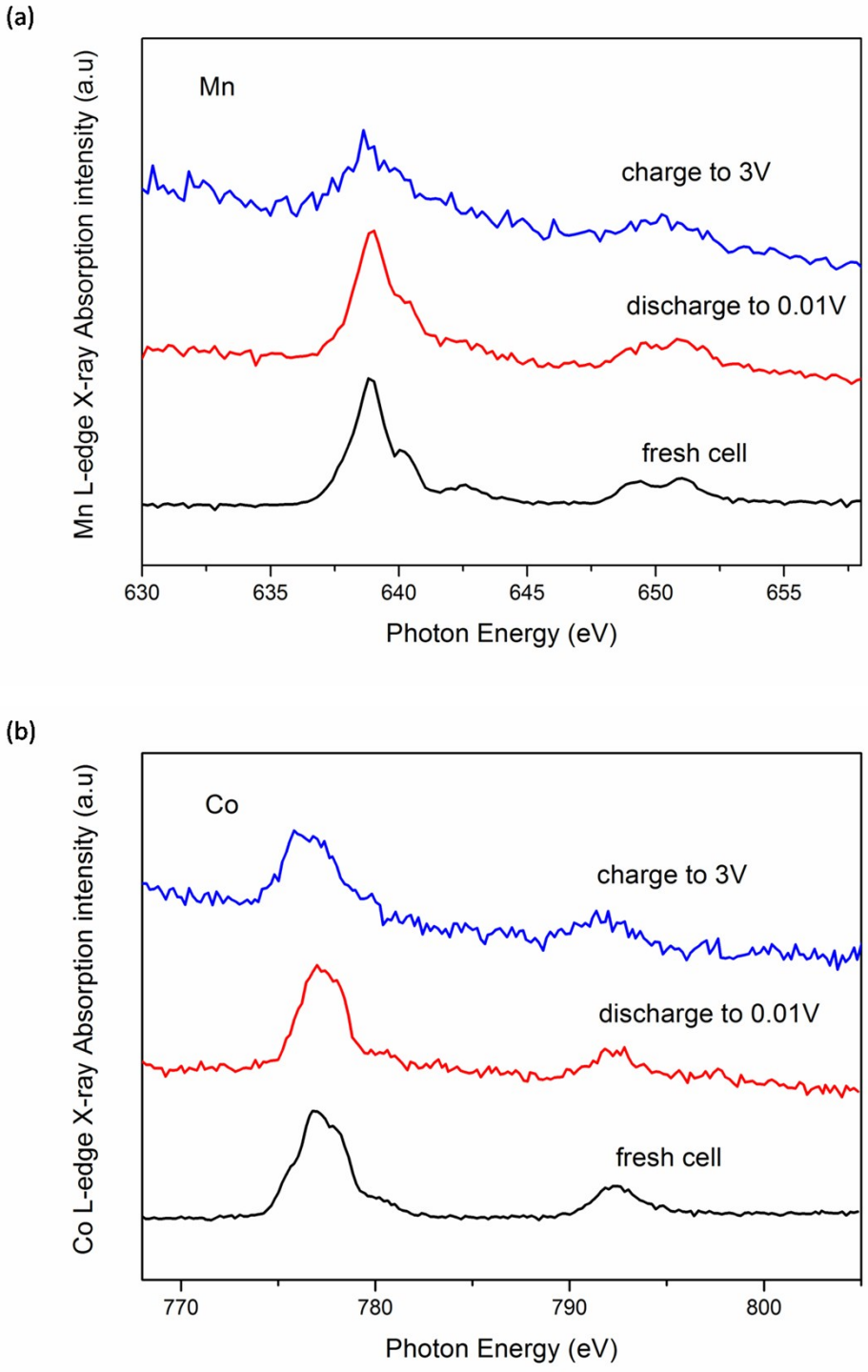

Figure S5. Mn and Co L-edges sXAS spectra of MnCo-BTC MOF at different states of charging and discharging. This confirmed that the metallic ions Mn^{2+} and Co^{2+} didn't present discernible changes during discharging/charging in energy position, implying that the Mn-ions and Co-ions maintain mostly unaltered in the Mn^{2+} and Co^{2+} state within the lithiation/delithiation process. The setup for sXAS is the same as that in ACS Appl. Mater. Interfaces (**DOI:** 10.1021/acsami.6b03648).

References

1. S. Maiti, A. Pramanik, U. Manju and S. Mahanty, *ACS APPLIED MATERIALS & INTERFACES*, 2015, **7**, 16357-16363.

2. Z. Cai, L. Xu, M. Yan, C. Han, L. He, K. M. Hercule, C. Niu, Z. Yuan, W. Xu, L. Qu, K. Zhao and L. Mai, *NANO LETT*, 2015, **15**, 738-744.