



## **Supplementary Materials**

## Soft X-ray Absorption Spectroscopic Investigation of Li(Ni<sub>0.8</sub>Co.<sub>1</sub>Mn<sub>0.1</sub>)O<sub>2</sub> Cathode Materials

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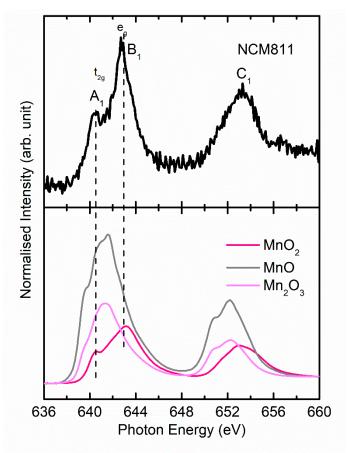
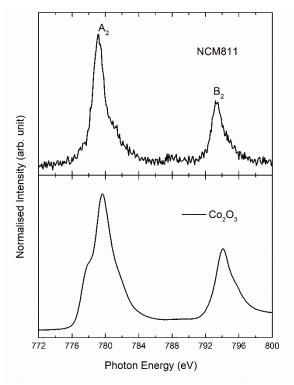
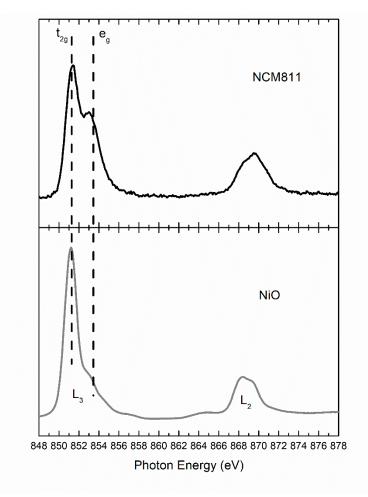


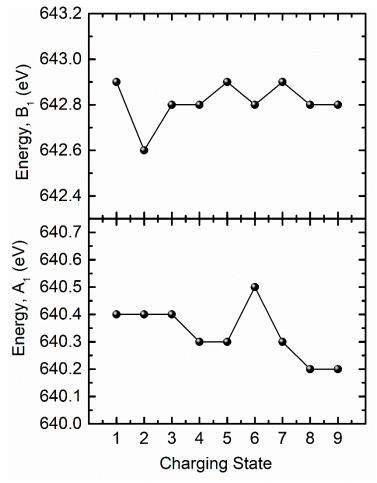
Figure S1: Mn *L*-edge spectrum of NCM811 cathode material along with reference oxide



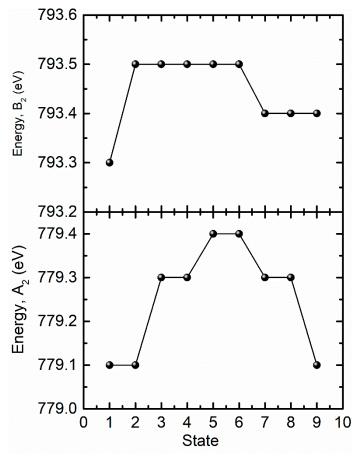
**Figure S2:** Co *L*-edge spectrum of NCM811 cathode material along with reference oxide.



**Figure S3:** Ni *L*-edge spectrum of NCM811 cathode material along NiO.



**Figure S4:** Positions of spectral features  $A_1$ , and  $B_1$  of Mn L-edge spectra for various states. These spectral features are corresponding to  $t_{2g}$  and  $e_g$  states.



**Figure S5:** Positions of spectral features  $A_2$ , and  $B_2$  of Co L-edge spectra for various states.