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Supporting Information for

Why is O3 to O1 phase transition hindered in $LiNiO_2$ on full delithiation?

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Supporting Figures

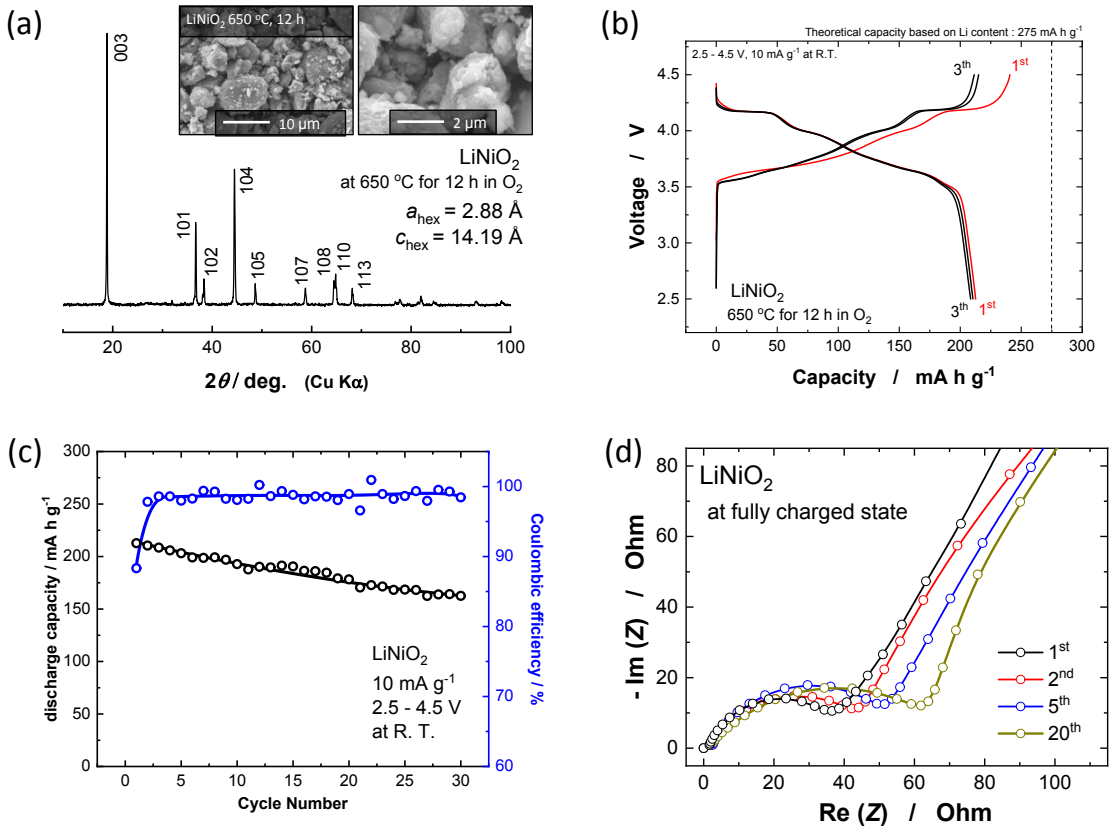

Figure S1. (a) An XRD pattern and SEM image and (b) charge/discharge curves of $LiNiO_2$ used in this study. Discharge capacity retention and Coulombic efficiency for 30 cycles are also shown in (c). (d) Changes in the impedance of $LiNiO_2$ at fully charged state.

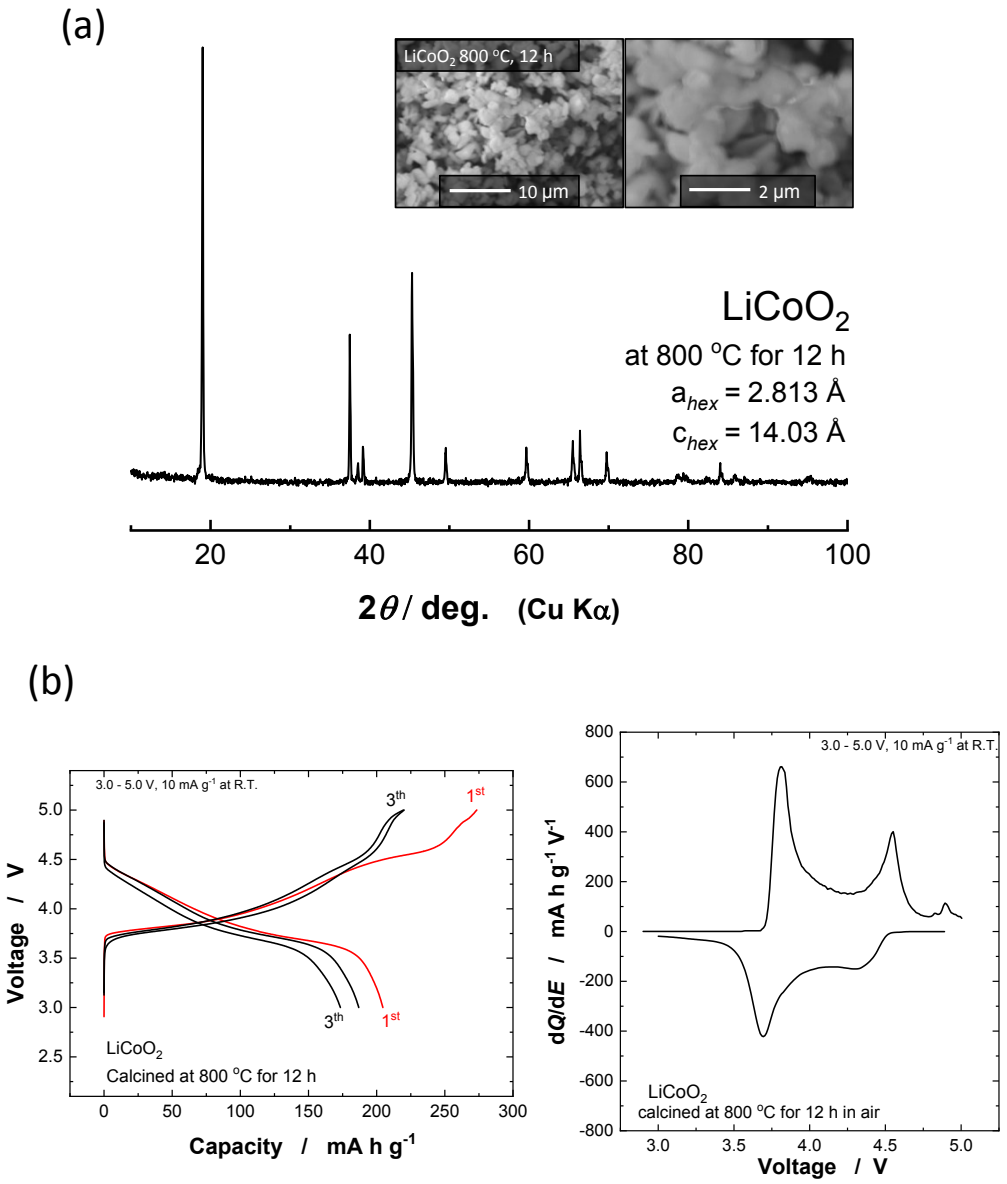

Figure S2. (a) An XRD pattern and SEM image and (b) charge/discharge curves with differential capacity plots of $LiCoO_2$ used in this study.

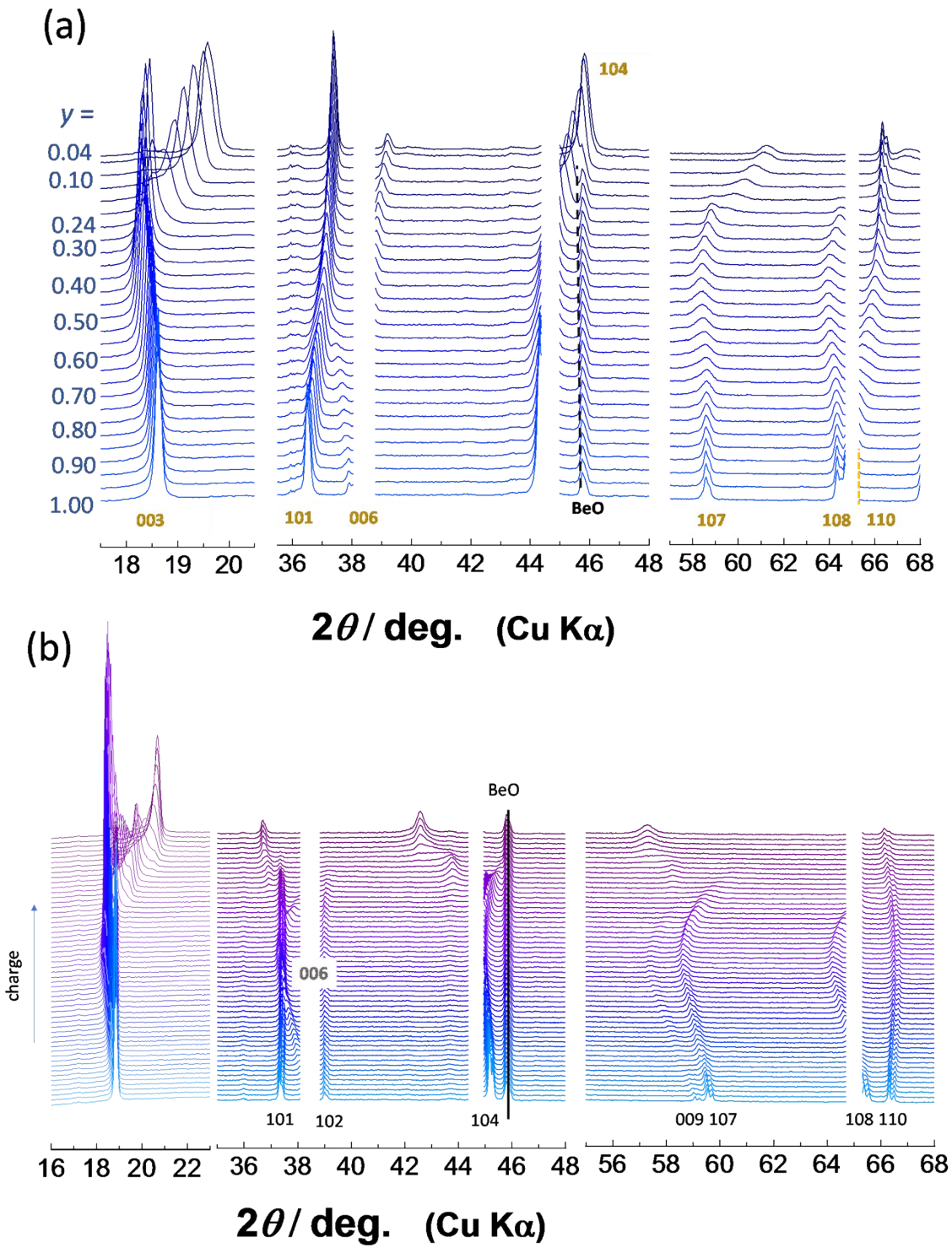

Figure S3. *In-situ* XRD patterns of (a) $LiNiO_2$ and (b) $LiCoO_2$ at a rate of 5 mA g^{-1}.

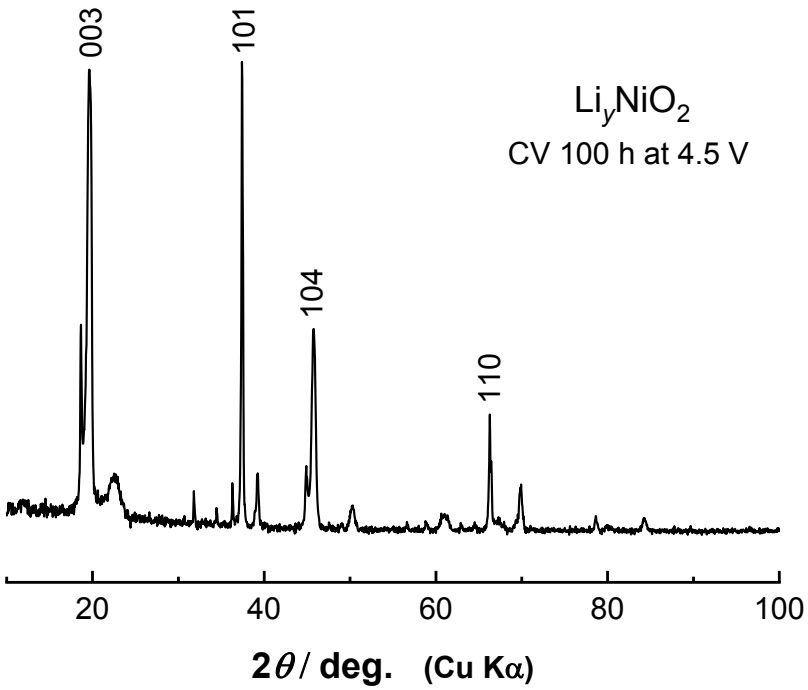

Figure S4. An XRD pattern of NiO_2 obtained by voltage holding at 4.5 V for 100 h in a Li cell.

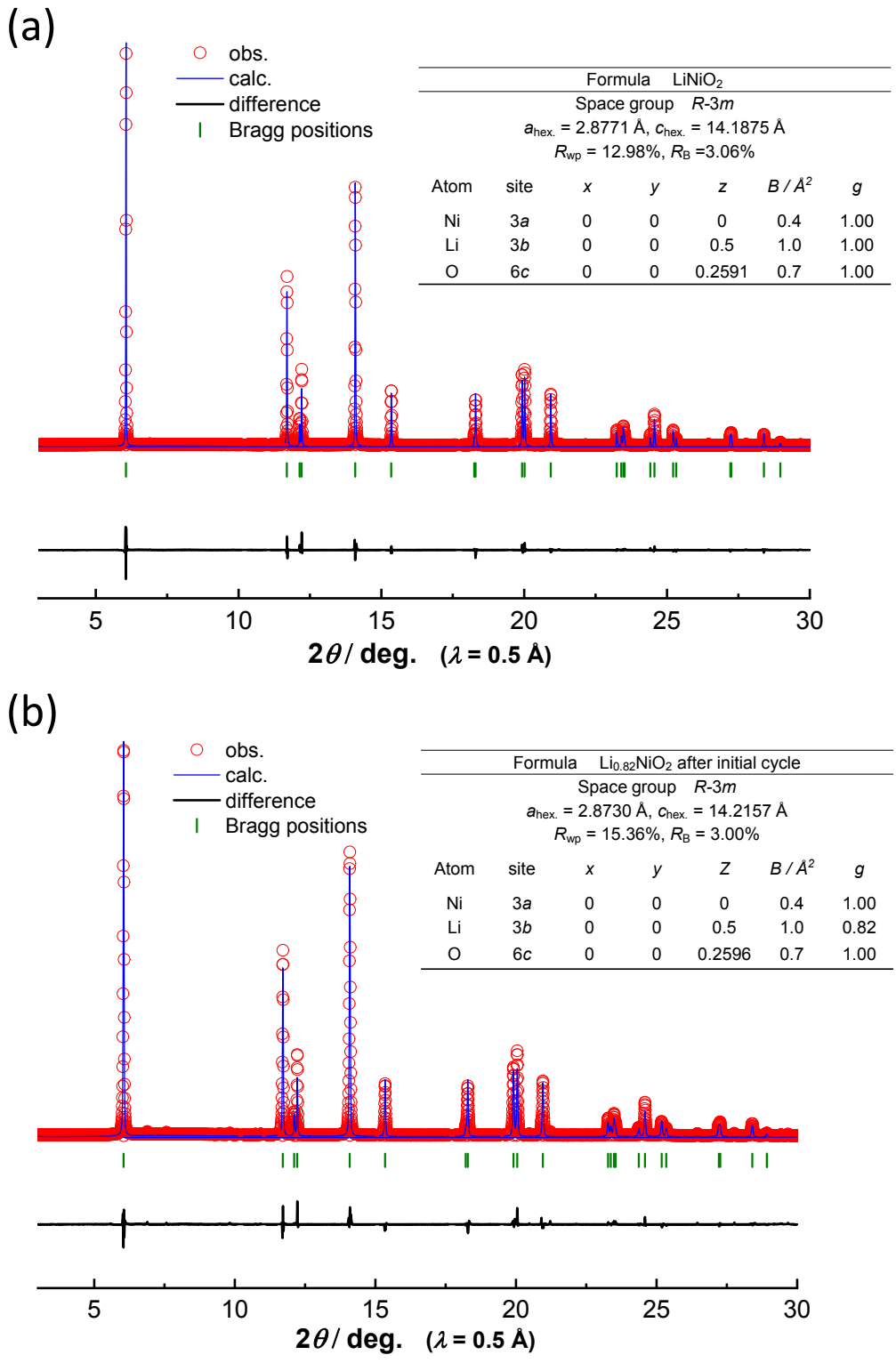

Figure S5. Results of Rietveld analysis on as-prepared $LiNiO_2$ (a) and $Li_{0.82}NiO_2$ after the initial cycle (b).