Supporting Information

Towards an efficient anode material for Li-ion batteries: understanding the conversion mechanism of nickel hydroxy chloride with Li-ions

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Fig. S1 (a) XRD pattern and (b) TG curve measured under air atmosphere of Ni(OH)Cl.
Fig. S2 (a) N\textsubscript{2} gas adsorption and desorption isotherm and (b) pore size distribution of Ni(OH)Cl.
Fig. S3 XRD patterns of Ni(OH)$_2$ and dehydrated NiCl$_2$. 
Fig. S4 Ex-situ HR-TEM images of Ni(OH)$_2$ and NiCl$_2$ at the fully charged states.
\( \text{Re} \): the electrolyte resistance, corresponding to the intercept of high frequency semicircle at \( Z_{re} \) axis

\( R_f \): the SEI layer resistance corresponding to the high-frequency semicircle

\( Q_1 \): the dielectric relaxation capacitance corresponding to the high-frequency semicircle

\( R_{ct} \): the denote the charger transfer resistance related to the middle-frequency semicircle

\( Q_2 \): the associated double-layer capacitance related to the middle-frequency semicircle

\( Z_w \): the Li-ion diffusion resistance

\textbf{Fig. S5} Equivalent circuit model used for ac impedance fitting.
Fig. S6 Nyquist plots and fitted curves and equivalent element parameters obtained from the model of equivalent circuit at fresh state and after 1\textsuperscript{st}, 5\textsuperscript{th}, and 50\textsuperscript{th} cycle.