SUPPLEMENTARY INFORMATION

Structural Behaviour and Charge Compensation Mechanism in $Li_2Fe_{1-x}Co_xSeO$ Solid Solutions During Reversible Delithiation
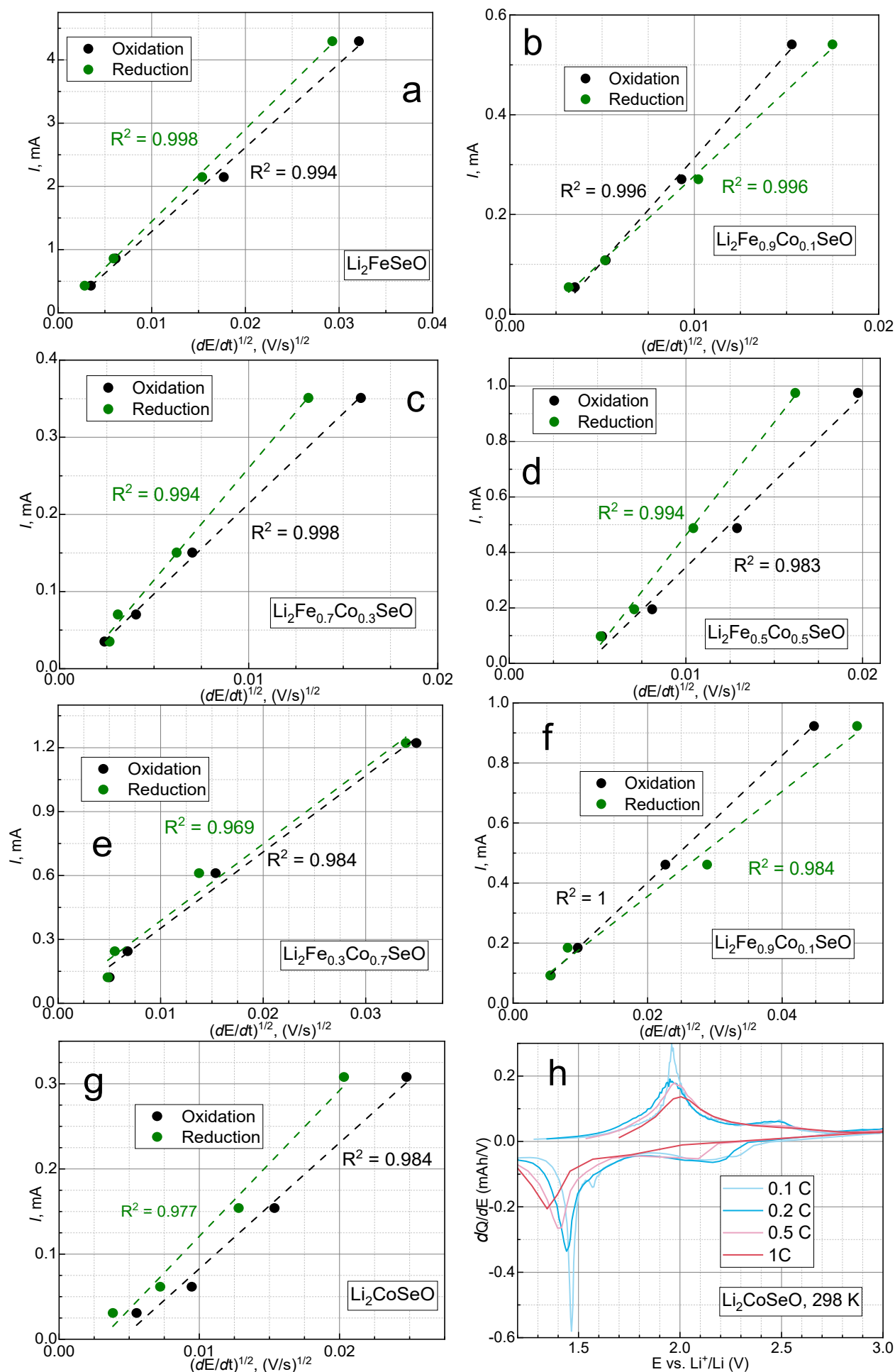
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Figure S1. (a – g) Linear relationship between the applied current and square root of voltage changing rate for $Li_2Fe_{1-x}Co_xSeO$ anti-perovskites at the maximal values of differential capacity plots. Panel h – dQ/dE plots for Li_2CoSeO as an example. The value of $R^2 \geq 0.95$ was considered as statistically reliable.
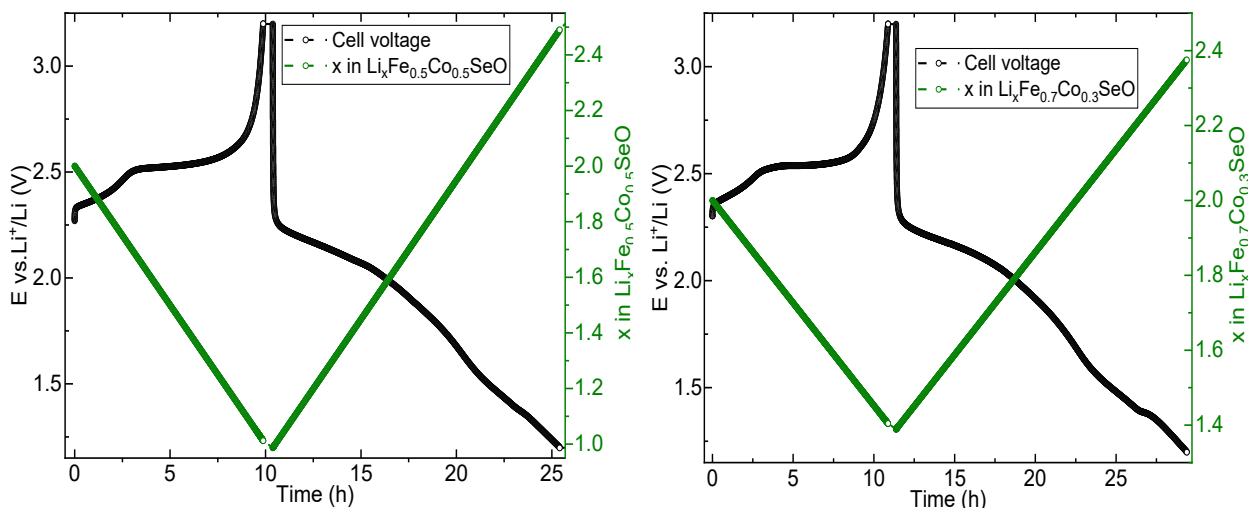
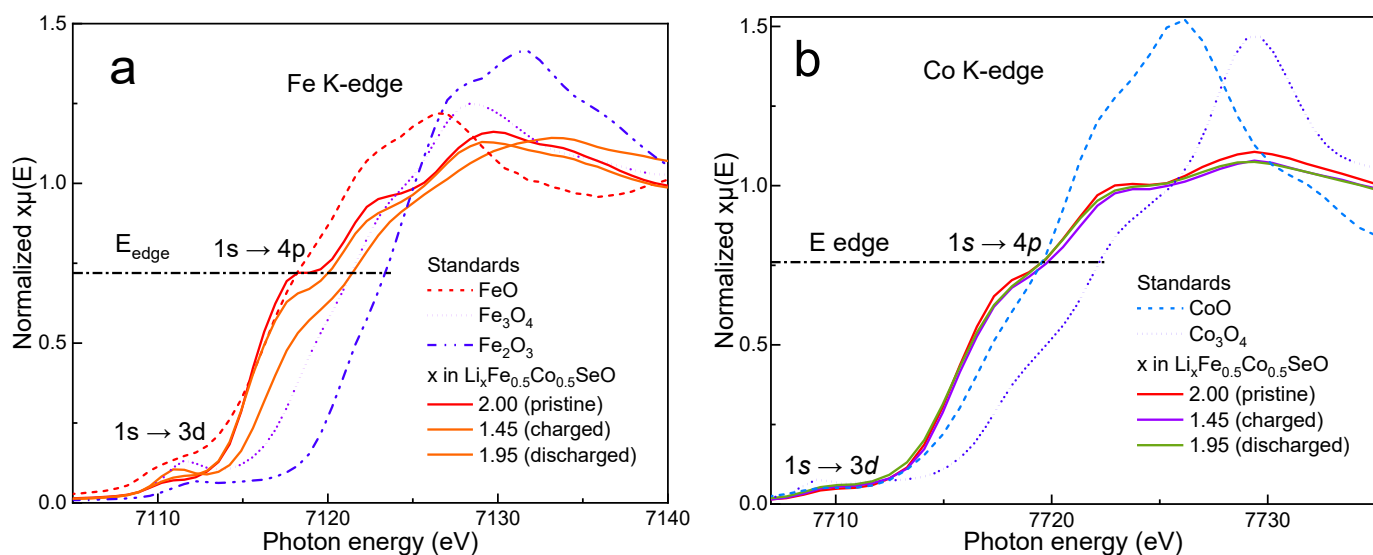Figure S2: Voltage and x vs. time for (left) $Li_xFe_{0.5}Co_{0.5}SeO$- and (right) $Li_xFe_{0.7}Co_{0.3}SeO$-based *operando* cells. Current density was 0.1 C.

Figure S3. Part of XAS spectra recorded for $Li_2Fe_{0.5}Co_{0.5}SeO$ in (a) Fe K-edge and (b) Co K-edge, to evaluate the initial valence states and redox behaviours of $3d$ elements.