

Supporting information

Combinatorial Synthesis of Epitaxial LiCoO_2 Thin Films on $\text{SrTiO}_3(001)$ via on-Substrate Sintering of Li_2CO_3 and CoO by Pulsed Laser Deposition

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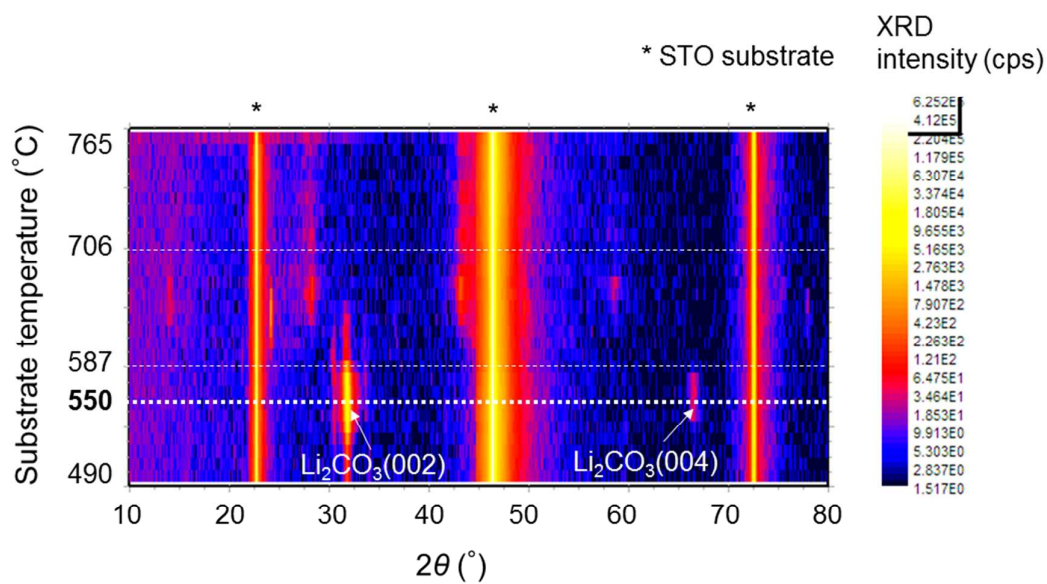


Figure S1. Out of plane XRD image plot of $\sim 1 \mu\text{m}$ Li_2CO_3 film deposited on 0.5wt%Nb:STO(001) substrate 200 mTorr oxygen with temperature gradient from 490 to 765 ° C along 15 mm substrate. The peak intensity of $\text{Li}_2\text{CO}_3(00l)$ became maximum at the growth temperature of 550 ° C.

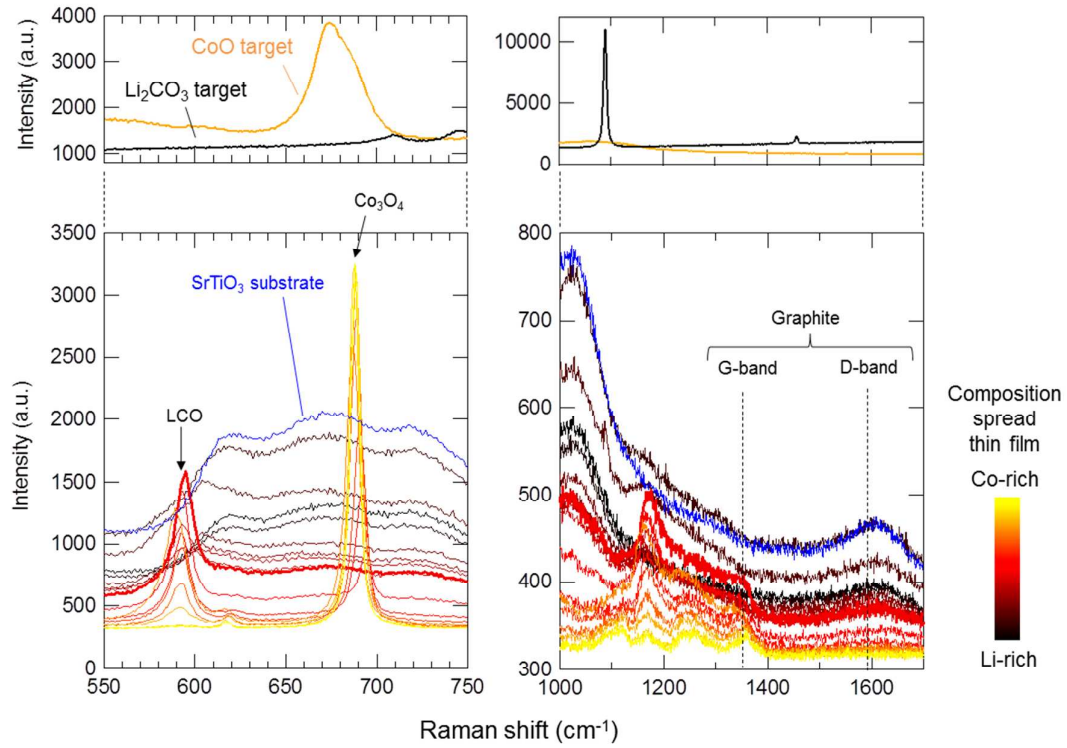


Figure S2. Raman spectra ($\lambda = 532$ nm) of the PLD targets (Li_2CO_3 and CoO , top graphs) and Li_2CO_3 - CoO composition spread thin film grown on $\text{STO}(001)$ substrate (bottom graphs). The bold curve in the composition spread thin film is the spectrum taken at the position where XRD intensity of $\text{LCO}(104)$ became maximum as shown in Fig.1(e). The graphite G- (~ 1350 cm^{-1}) and D-bands (~ 1590 cm^{-1}) are denoted by the dotted lines in the bottom graph. Since the peak observed at the G-band position became stronger in the Co-rich region, this peak is not originated from the carbon from Li_2CO_3 . The broad peak observed at the D-band position is due to the Nb:STO substrate. Thus, there is no graphite related Raman peak in the composition spread thin film.

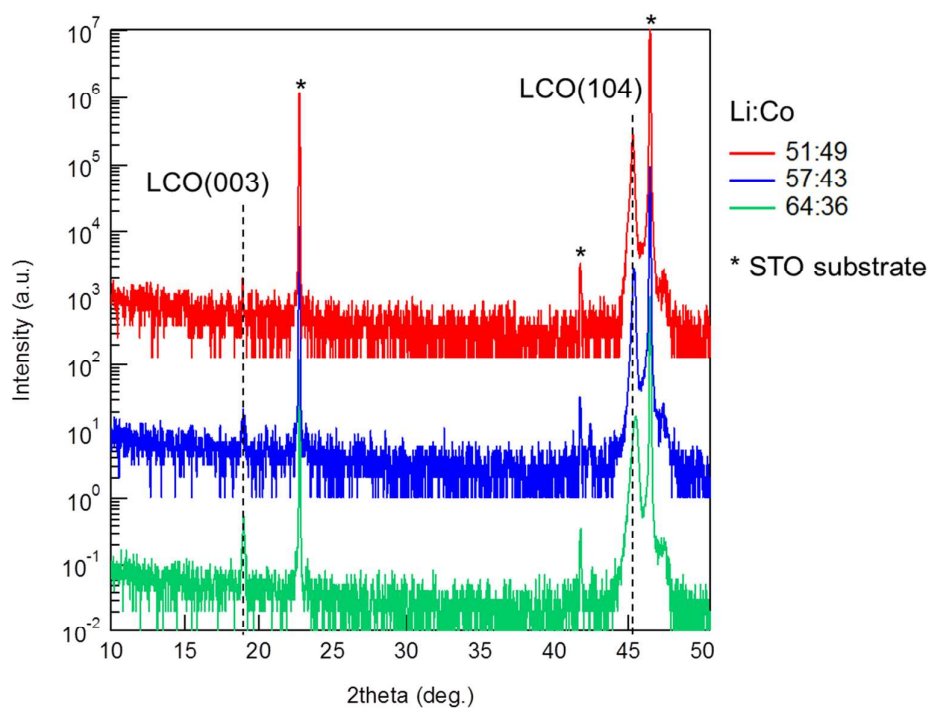


Figure S3. XRD patterns of the uniform LCO thin films with different nominal Li:Co ratio.

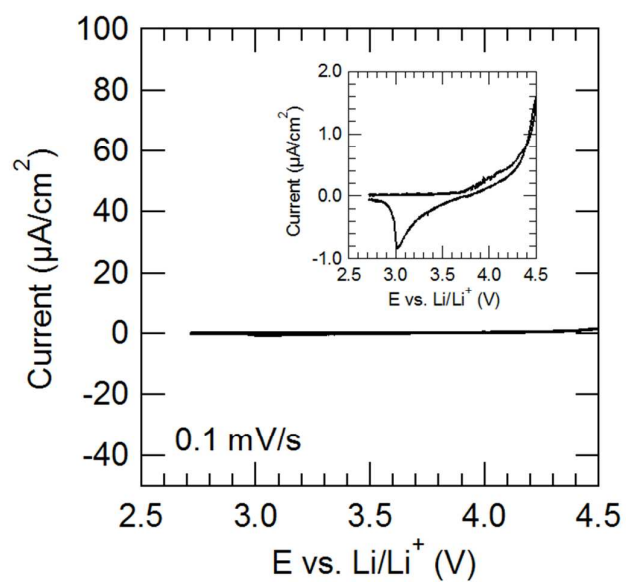


Figure S4. Cyclic voltammogram of the bare Nb:STO(001) substrate. The current range is the same with the Figure 5 (Inset shows the magnified plot).