

Supplemental information for:

Lithium intercalation in the surface region of an $\text{LiNi}_{1/3}\text{Mn}_{1/3}\text{Co}_{1/3}\text{O}_2$ cathode through different crystal planes

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1. Refined parameters of XRR analysis

Table S1 Structural parameters of the $\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$ films refined by XRR analyses.

(a) (1-18) film

layer	Thickness [nm]	SLD [nm^{-2}]	Roughness [nm]
$\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$	25.0	3.78×10^{-3}	2.2
SrRuO_3	28.4	4.73×10^{-3}	2.8
Nb:SrTiO_3	-	3.97×10^{-3} [fixed]	1.2

(b) (104) film

layer	Thickness [nm]	SLD [nm^{-2}]	Roughness [nm]
$\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$	23.4	3.76×10^{-3}	1.8
SrRuO_3	26.4	4.78×10^{-3}	1.8
Nb:SrTiO_3	-	3.97×10^{-3} [fixed]	1.3

(c) (003) film

layer	Thickness [nm]	SLD [nm^{-2}]	Roughness [nm]
$\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$	29.1	3.78×10^{-3}	2.3
SrRuO_3	33.7	4.73×10^{-3}	1.0
Nb:SrTiO_3	-	3.97×10^{-3} [fixed]	2.1

2. AFM image of the $\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2(003)$ surface

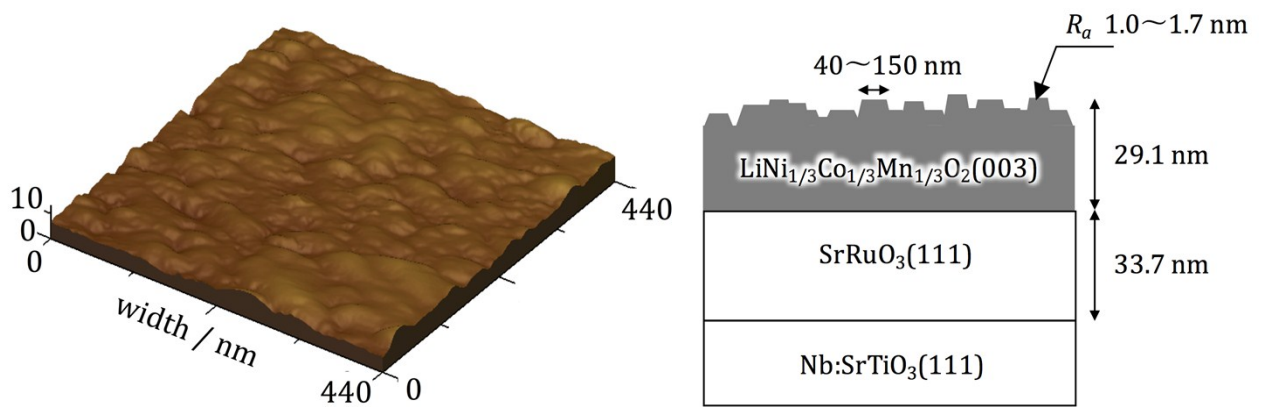


Figure S1 AFM image and schematic of the $\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2(003)$ film synthesized on $\text{SrRuO}_3/\text{Nb:SrTiO}_3(111)$. The thicknesses were refined by XRR. The surface morphology and roughness of the film was investigated by atomic force microscopy (AFM, JEOL, JSPM-5200).