

Supplementary Information

Oriented growth of stacking α -cobalt hydroxide salt continuous films and their topotactic-like transformation to oriented mesoporous films of Co_3O_4 and CoO

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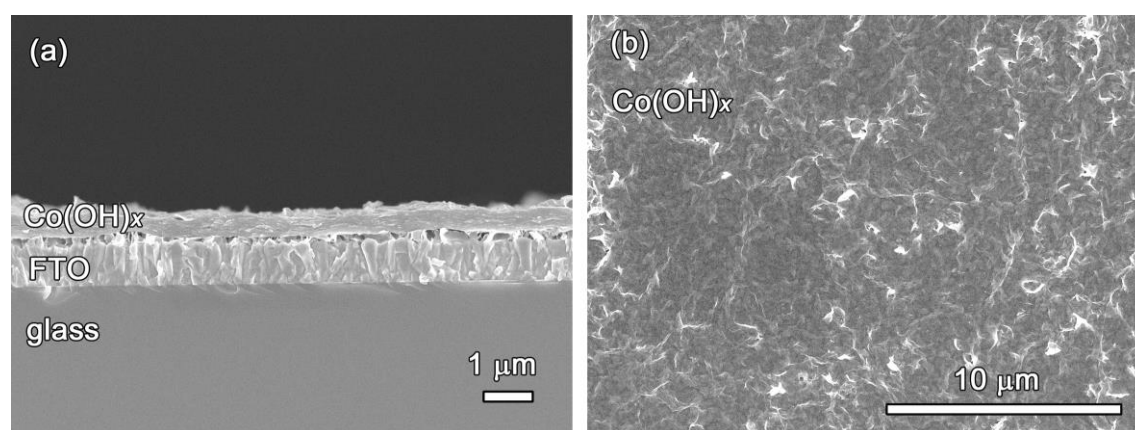


Figure S1. (a) cross-sectional and (b) plan-view FESEM images of [001]-oriented layered cobalt hydroxide salt (Co-LHS) films electrodeposited on F-doped SnO_2 (FTO) substrates in $\text{Co}(\text{NO}_3)_2$ aqueous solution at room temperature.

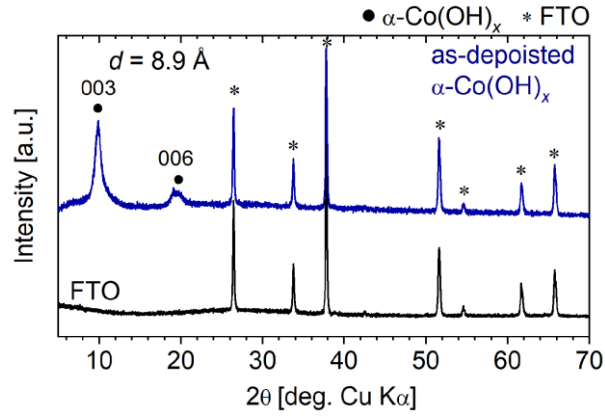


Figure S2. X-ray diffraction patterns of [001]-oriented Co-LHS films electrodeposited on FTO substrates in $\text{Co}(\text{NO}_3)_2$ aqueous solution and dried naturally in air.

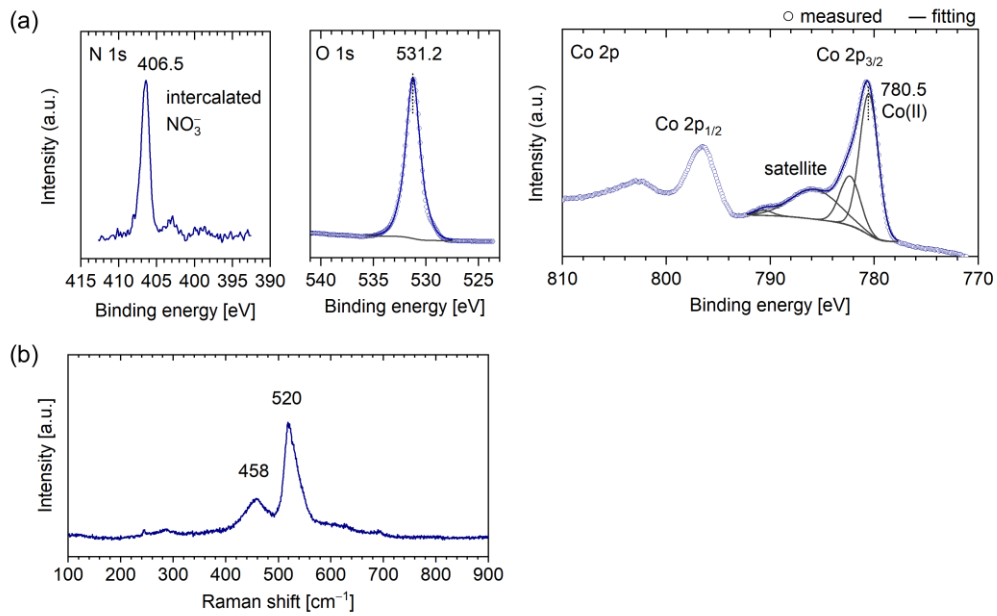


Figure S3. (a) N 1s, O 1s and Co 2p XPS spectra and (b) Raman spectrum of [001]-oriented Co-LHS films electrodeposited on FTO substrates in $\text{Co}(\text{NO}_3)_2$ aqueous solution at room temperature.

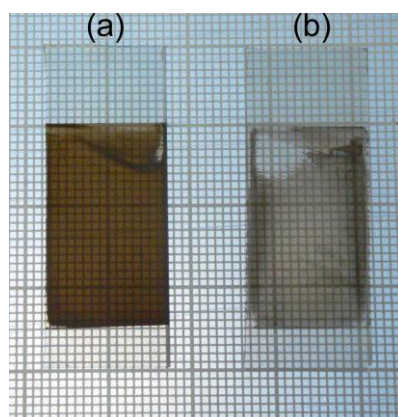


Figure S4. Photograph of the obtained samples: (a) [111]-oriented Co_3O_4 mesoporous film (MPF) obtained by heating the [001]-oriented Co-LHS film at 550 °C for 1 h in air and (b) [111]-oriented CoO MPF obtained by heating the [001]-oriented Co-LHS film at 500 °C for 1 h under vacuum.

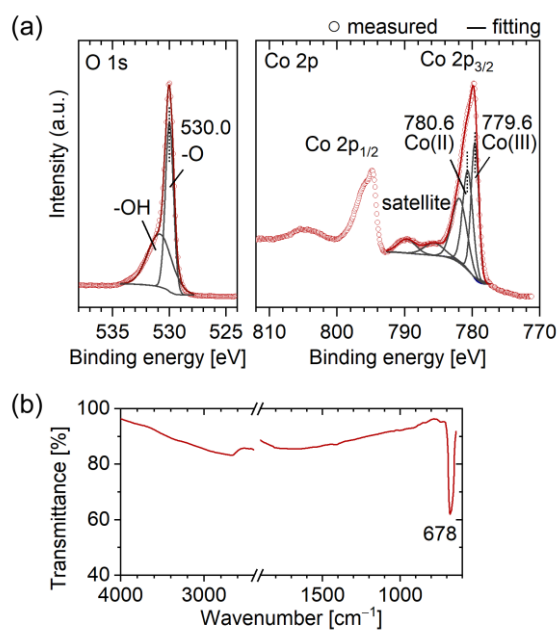


Figure S5. (a) O 1s and Co 2p XPS spectra and (b) ATR-FTIR spectrum of the [111]-oriented Co_3O_4 mesoporous films (MPFs) obtained by heating [001]-oriented Co-LHS films at 550 °C for 1 h in air.

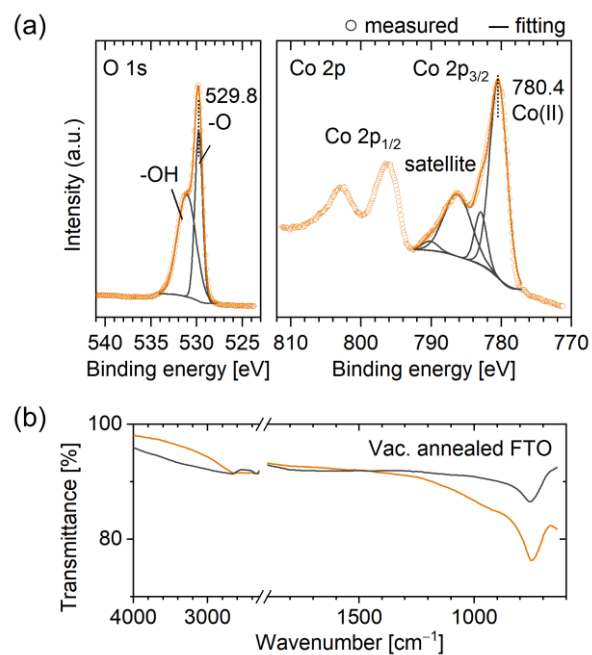


Figure S6. (a) O 1s and Co 2p XPS spectra and (b) ATR-FTIR spectrum of the [111]-oriented CoO mesoporous films (MPFs) obtained by heating [001]-oriented Co-LHS films at 500 °C for 1 h under vacuum.