Supporting Information

Interaction between Li, Ultrathin Adsorbed Ionic Liquid Films and CoO(111) Thin Films: A Model Study of the Solid|Electrolyte Interphase Formation

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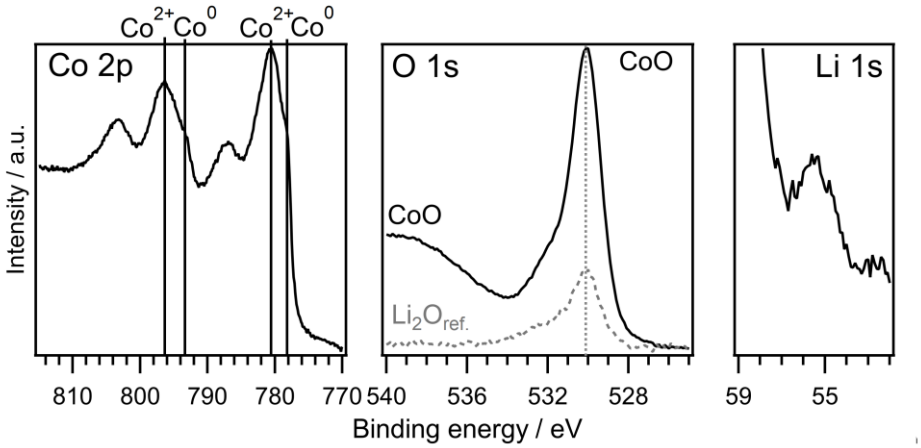

Figure S1. XP Co 2p, O 1s and Li 1s core level spectra after deposition of 1 MLE of Li on a CoO(111) thin film on Ru(0001). After Li deposition a Co^0 state is clearly visible in the Co 2p regime. A Li_2O reference spectrum is included in the O 1s range (Li_2O was generated by leaving a freshly prepared Li film in UHV for at least 1h. During this time residual water can react with the Li film, forming a small amount of Li_2O). The emission angle was 80°.

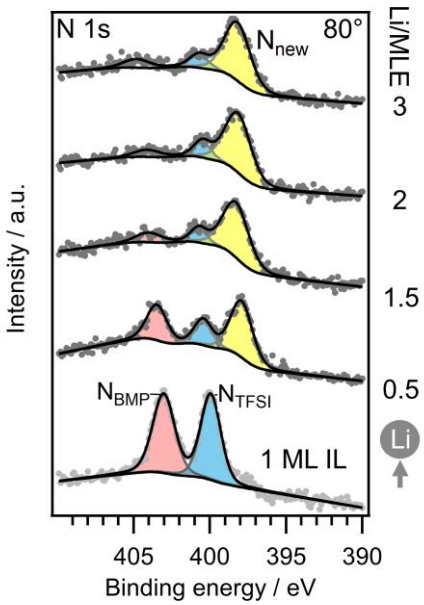

Figure S2. XP N 1s core level spectra during stepwise postdeposition of Li to an adsorbed [BMP][TFSI] monolayer on a CoO(111) thin film on Ru(0001).

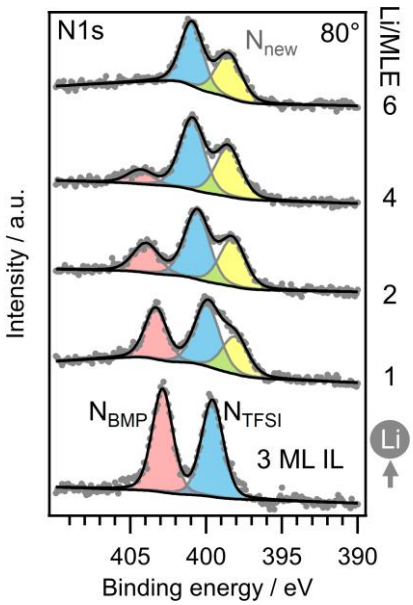

Figure S3. XP N 1s core level spectra during stepwise postdeposition of Li to an adsorbed [BMP][TFSI] multilayer (~ 3 ML) on a CoO(111) thin film on Ru(0001).

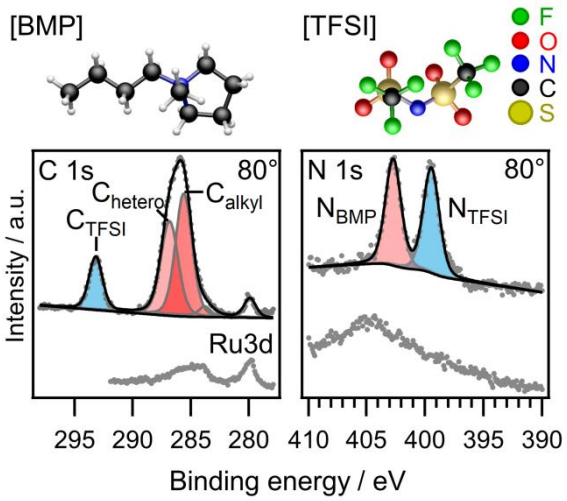

Figure S4. C 1s and N 1s core level spectra of an adsorbed [BMP][TFSI] monolayer on a CoO(111) thin film on Ru(0001) deposited / recorded at RT. Spectra recorded before IL deposition are shown at the bottom of each panel. Low-intensity Ru 3d doublets are visible in the C 1s range before and after IL deposition. Molecular representations of [BMP][TFSI] (also referred to as $[C_4C_1Pyrr]Tf_2N$) are shown above the panels (F (green), O (red). N (blue), F (black), S (gold)).