Electronic Supplementary Material (ESI) for Materials Advances.

Supporting Information:

Molecular gate effects in fluoroalkylsilane self-assembled monolayer grafted on $LiNi_{0.5}Mn_{1.5}O_4$ cathodes: Toward efficient ion-exchanging reaction

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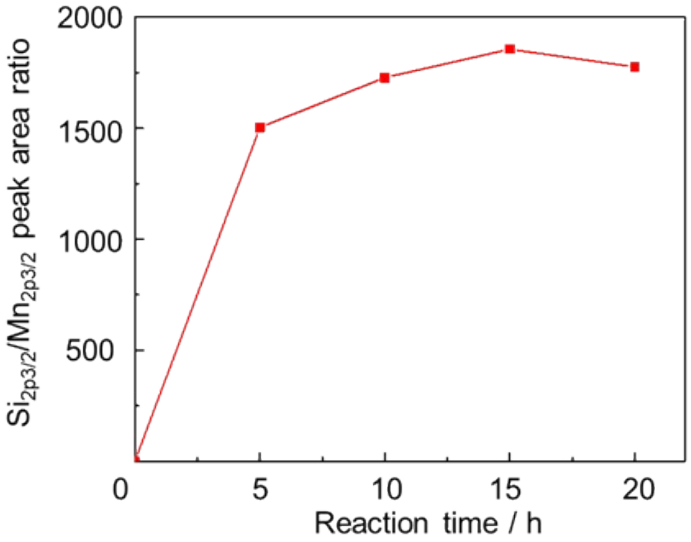

Figure S1.

The changes in the peak area ratio of $Si2p_{3/2}/Mn2p_{3/2}$ with increase of the time. The peak area ratio became constant after 15h. It suggests that the LNMO surface was densely covered with FAS monolayer based on Langmuir type adsorption theory.

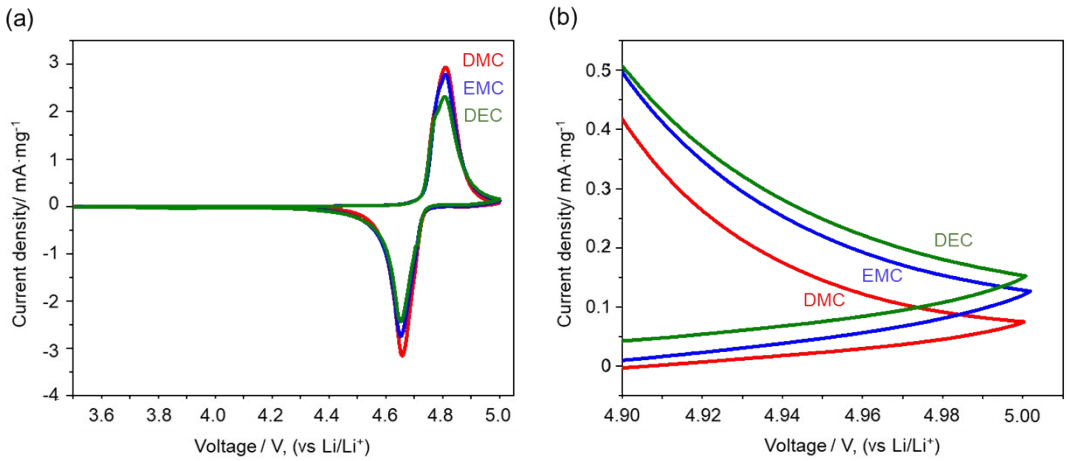

Figure S2.

Cyclic voltammograms of the FAS-13 monolayer immobilized LNMO electrodes ||1M $LiPF_6$, EC-non cyclic carbonates (DMC, EMC, and DEC) ||Li half-cells with various non-cyclic carbonates. Sweep rate is 0.1 $mV \cdot s^{-1}$.

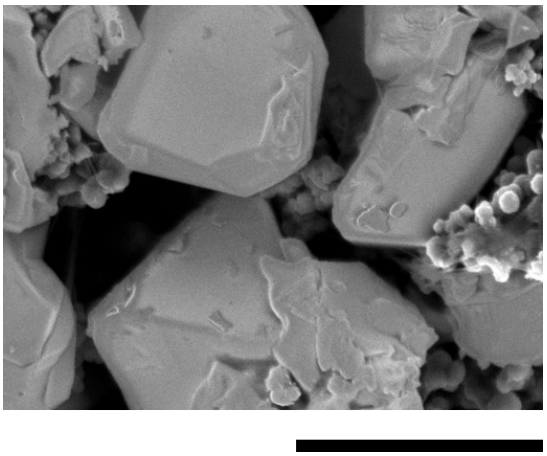

Figure S3: FE-SEM images of the surface of the bare LNMO cathode before cycling. Scale bar is 1.0 μm.

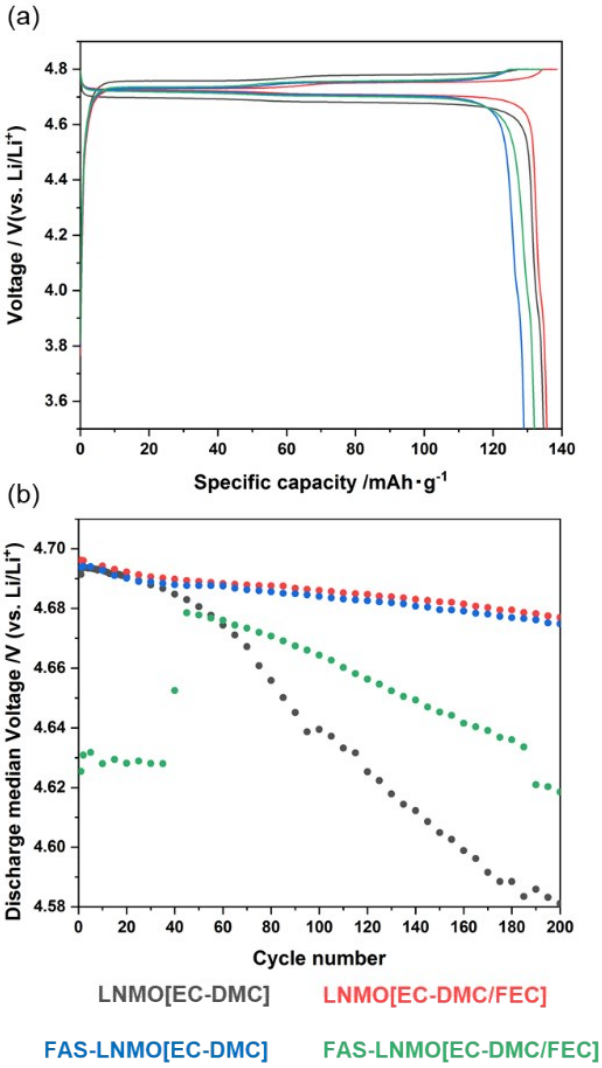

Figure S4: a) Galvanostatic charge/discharge curves of the first cycle in half-cell at 2C and 50˚C, b) Discharge median voltage against cycle number.

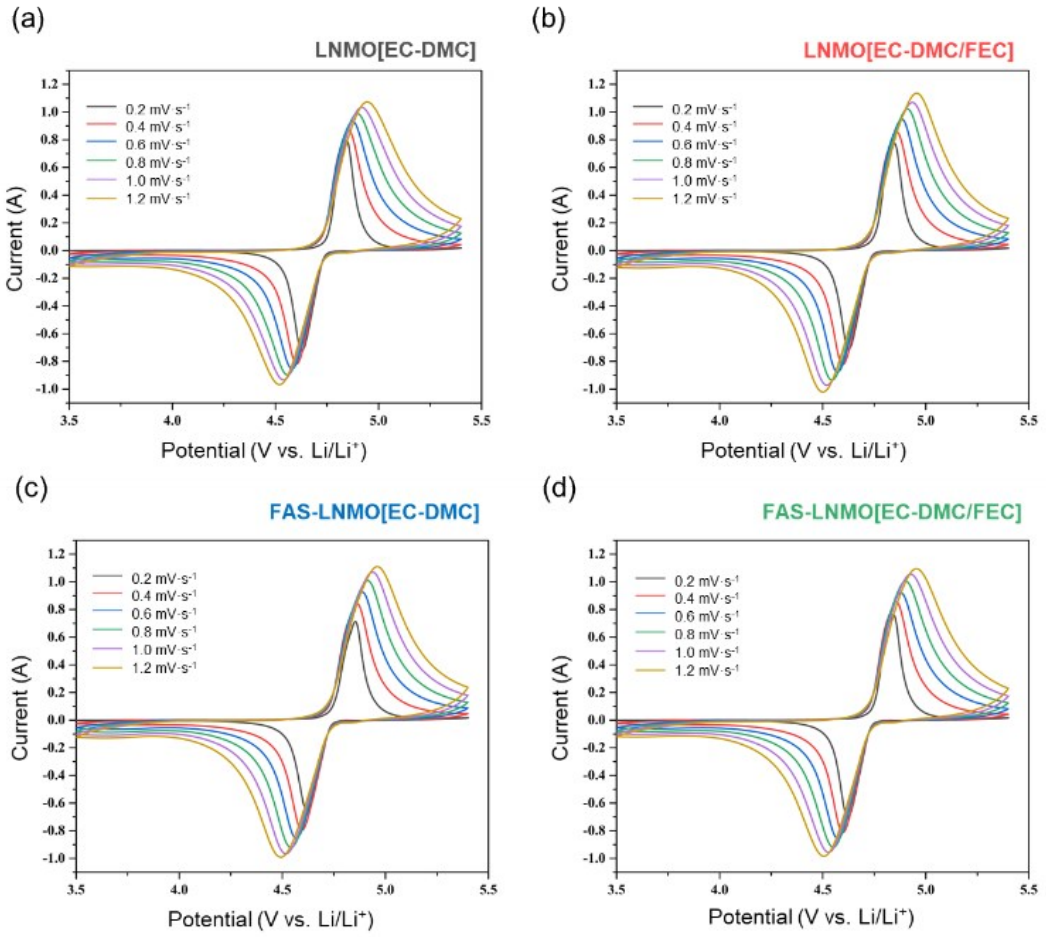

Figure S5: Cyclic-voltammograms taken at different sweep rates for a) LNMO(EC-DMC), b) FAS-LNMO(EC-DMC), c) LNMO(EC-DMC/FEC), d) FAS-LNMO(EC-DMC/FEC).