

Novel Electrolyte Additive Enabling Performance Improvement of High-Energy Density
Lithium-ion Battery Based on SiO_x -Graphite Anode

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Development on high-energy density lithium-ion batteries is on strong demand to meet the required long driving range of electric vehicles. The use of nickel-rich NCM layered oxide cathode active materials with 80 % or higher Ni content and/or a further increase of their capacity by charging to higher voltages than conventional 4.2 V suit the needs. Interfacial instability with the electrolyte under high voltages and structural degradation often lead to poor performance. On the other hand, silicon oxide(SiO_x)-graphite has been studied as a high capacity anode material to meet the increased capacity of the cathode. The anode possesses severe failures due to large volume change of Si and the interfacial instability with the electrolyte. Herein, we present the designed novel electrolyte additives to stabilize solid electrolyte interphase(SEI) and to improve cycling performance of the SiO_x -graphite||NCM811 full-cell. Analysis of the effects of designed additives on the SEI would be discussed in the meeting.

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