

High-rate and High-Voltage Performance of Lithium-ion Battery Through Stabilization of Solid Electrolyte Interphase (SEI)

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Lithium-ion battery (LIB) market for electric vehicles and energy storage systems is rapidly expanding. One of the biggest challenges in LIB research is to achieve outstanding cycle life, charge rate, energy density, and safety. For fast charge, battery chemistry and reaction kinetics are thus being evolved toward the development of quickly charged LIBs in minutes scale, from the current hours scale. In the LIB electrolyte perspective, commercial carbonate-based electrolyte has several limitations to attaining high-rate and high-voltage performance, due to the limited ionic conductivity and viscosity, low thermal and anodic stabilities. To mitigate those issues, extensive research on new electrolyte systems has been ongoing worldwide. Herein, we present the high-rate capability and high-voltage cycling performance of nickel-rich cathode-based lithium-ion full-cell through the stabilization of newly designed electrolyte derived solid electrolyte interphase. Its correlation to performance will be discussed in this meeting.

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