

Polymer Interphases designed with Single-Ion Conducting polymers

Luis Miguel Guerrero Mejia^{1,2}, Mariana Vargas Ordaz^{1,2}, Miran Gaberscek^{1,2},
Aiping Wang¹, Sara Drvarič Talian¹, Robert Dominko^{1,2,3}

1 National Institute of Chemistry, Hajdrihova 19, SI-1000, Ljubljana, Slovenia

*2 University of Ljubljana, Faculty of Chemistry and Chemical Technology, Večna
pot 113, SI-1001, Ljubljana, Slovenia*

*3 ALISTORE -European Research Institute, 33 rue Saint-Leu, Amiens 80039
Cedex, France*

Interphase stability is a prerequisite for long-term battery operation. This is even more critical in all-solid-state batteries. In this presentation, we will show how the mixed ionic–electronic conducting layer on the surface of the NMC811 cathode effectively modulates interfacial kinetics, preserves the structural integrity of the cathode, and enables stable cycling under pressure-free conditions. A similar strategy can be applied to metallic lithium, where the formation of a multi-component protective coating based on modified cellulose, a single-ion conducting polymer, and lithium nitrate is used. This coating promotes uniform lithium-ion transport, suppresses high-surface-area lithium and dendrite formation, and markedly improves Coulombic efficiency and cycling stability.

References

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- 2) Luis Miguel Guerrero-Mejía, et al. Intertwined Hybrid Artificial Cathode-Electrolyte Interphase for Stabilizing High-Voltage Cathode Materials, submitted

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