

Recent advances in nanoengineering of electrode-electrolyte interfaces to realize high-performance Li-ion batteries

Na-Yeong Kim¹, Il Gyu Kim¹, Behnoosh Bornamehr², Volker Presser², Hiroyuki Ueda³,
Ho-Jin Lee¹, Jun Young Cheong⁴, and Ji-Won Jung¹

¹University of Ulsan

²INM Leibniz-Institute for New Materials gGmbH

³Deakin University

⁴University of Bayreuth

February 16, 2023

Abstract

A suitable interface between the electrode and electrolyte is crucial in achieving highly stable electrochemical performance for Li-ion batteries, as facile ionic transport is required. Recently, intriguing research and development have been carried out to form a stable interface between the electrode and electrolyte. Therefore, it is essential to investigate emerging knowledge and contextualize it. The nanoengineering of the electrode-electrolyte interface has been actively researched both at the electrode/electrolyte and interphase levels, which calls for significant attention. This review presents and summarizes some recent advances aimed at nanoengineering approaches to build a more stable electrode-electrolyte interface and assess the impact of each approach adopted. Furthermore, future perspectives on the feasibility and practicality of each approach will also be reviewed in detail. Finally, this review aids in projecting a more sustainable research pathway for a nanoengineered interphase design between electrode and electrolyte, which is pivotal for high-performance, thermally stable Li-ion batteries.

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