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One-pot Solution Coating of High Quality LiF Layer to Stabilize Li Metal Anode

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Abstract

The high reactivity of Li metal anodes towards liquid electrolytes leads to an unstable and accumulated solid electrolyte interphase (SEI) film, which results in dendrite growth and low Coulombic efficiency (CE). Lithium fluoride (LiF) coating is considered as a reliable and dense SEI film to protect the reactive anode, however, the chemistry to form uniform, conformal and high quality LiF protection layer on Lithium metals remains as a major challenge. Here we develop a simple solution method to obtain LiF coating on Li metal anodes. We have discovered a chemical method to fabricate LiF coating via the in-situ reaction between metallic Li and polyvinylidene fluoride (PVDF)-dimethyl formamide (DMF) solution. Owing to the chemically and mechanically stable artificial SEI film, the LiF-coated Li anode

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