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3D Printed Separator for the Thermal Management of High-performance Li Metal Anodes

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Abstract

Lithium (Li) metal anodes with a high theoretical gravimetric capacity and a low redox potential have attracted considerable attention for Li-ion based batteries, including Li-sulfur (Li-S) and Li-oxygen (Li-O₂) batteries. The elimination of safety concerns and long cycling stability issues are the main challenges that must be solved to apply Li metal anodes in any application. Herein, we design a novel and safe separator for Li metal batteries by integrating thermally management boron nitride (BN) nanosheets into poly vinylidene fluoride-hexafluoropropene (PVDF-HFP) via an advanced extrusion based 3D printing technique. The BN-separator offers a uniform thermal distribution interface, which enables homogeneous Li

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