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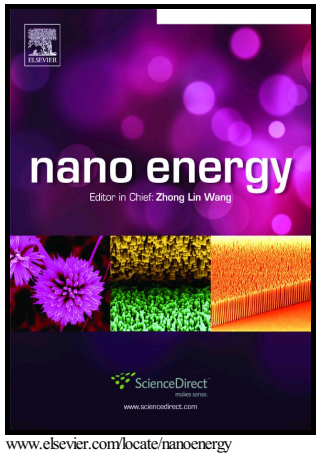

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Interface engineering of sulfide electrolytes for all-solid-state lithium batteries

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Abstract

All-solid-state lithium batteries (ASSLIBs) employing sulfide solid electrolyte hold high promise to replace traditional liquid-electrolyte LIBs due to their high safety and energy density. However, Li dendritic growth in sulfide electrolyte limits the realization of the high energy of ASSLIBs. In this work, we use LiF (or LiI) layer at the interface between Li and sulfide electrolyte and penetrated HFE (or I solution) inside of sulfide electrolyte to suppress the Li dendrite growth. Due to the higher interface energy of LiF/Li than that of LiI/Li, LiF interlayer show much higher capability than LiI in suppressing the Li dendrite. Even if the Li dendrite breaks through LiF (or LiI) interlayer, the Li dendrites will be consumed by coated/penetrated