

Communication

Lithium azide as a novel electrolyte additive for all-solid-state Li-S batteries

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Abstract

Of the various beyond lithium-ion battery technologies, lithium-sulphur (Li-S) batteries have an appealing theoretical energy density and are being intensely investigated as next generation rechargeable lithium metal batteries. However, the stability of the Li° anode is among the most urgent challenges that need to be addressed to ensure the long-term stability of Li-S batteries. In this work, we report lithium azide (LiN_3) as a novel electrolyte additive for all-solid-state Li-S batteries (ASSLSBs). It results in the formation of a thin, compact and highly conductive passivation layer on Li° anode, thereby avoiding dendrite formation, and polysulfide shuttling. It superbly enhances the cycling performance, Coulombic and energy efficiencies of ASSLSBs, outperforming the state-of-the-art additive lithium nitrate (LiNO_3)