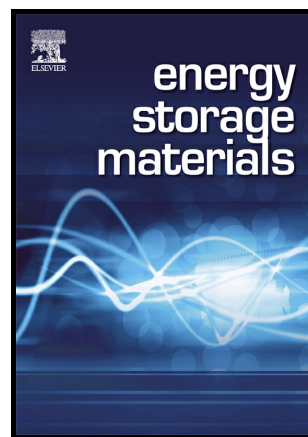


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Tellurium-tin Based Electrodes Enabling Liquid Metal Batteries for High Specific Energy Storage Applications

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Abstract

Developing high energy density batteries is of great significance for various energy storage applications. The novel liquid metal batteries (LMBs), with the merits of low-cost and long-lifespan, however deliver relatively low specific energy due to the electromotive force (EMF) limitation of bimetallic electrodes. Metalloid tellurium (Te) is a potentially high voltage electrode candidate for LMB, but challenged by its poor electronic conductivity and high solubility in molten salts. Herein, for the first time, we demonstrate a high voltage LMB with high energy density enabled by metalloid Te alloying with metallic Sn as positive electrode. This Te-Sn alloying strategy dramatically enhances the electronic conductivity of Te based electrodes, and suppresses the solubility of Te in molten salt electrolyte as well. The

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