Energy storage composite current collector

Anode-free lithium (Li) metal batteries are promising alternatives to current Li-ion batteries due to their advantages such as high energy density, low cost, and convenient production. However, the copper (Cu) current collector accounts for more than 25 wt% of the total weight of the anode-free battery without capacity contribution, which severely reduces the ...

Current collector, an important component of the batteries, acts as a crucial part to the structural stability and mechanical integrity of the electrode. In this paper, the effect of current collector"s thickness on the cyclic performance of silicon (Si) composite electrodes is investigated experimentally.

1 INTRODUCTION. Low-carbon energy storage devices have found applications across a broad spectrum, from portable devices like wireless earphones 1 and personal laptops to larger systems such as energy grids and photovoltaic power stations. Batteries and supercapacitors stand out among existing energy storage devices due to their noteworthy features, including high energy ...

A plastic film composite current collector (PFCC) is a new battery collector with a sandwich-like structure made of a two metal layer, plastic polymer, and another metal layer. IPFCCs have attracted research attention because they can improve the energy density and safety of lithium-ion batteries (LIBs). ... Energy Storage Science and ...

Current collectors play a very crucial role in the performance of an energy storage device. Regarding supercapacitors, material design, processing, and current collectors" surface properties can result in substantial variation in energy density, power output, cyclic charge-discharge behavior, and other key performance parameters.

Serving as a proof of concept, additive manufacturing and electrophoretic deposition are leveraged in this work to enable structural lithium-ion batteries with load-bearing and energy storage dual functionality. The preparation steps of a complex 3D printed copper current collector, involving the formulation of a photocurable resin formulation, as well as the ...

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