Three-dimensional electrodes for electrochemical energy storage

Overview

This review summarizes recent advancements in 3D ordered porous (3DOP) electrode materials and their unusual electrochemical properties endowed by their intrinsic and geometric structures. For electrochemical energy storage, increasing the electrode thickness is an effective approach to achieving higher energy density from a given material. However, this often compromises ion transport, leading to diminished performance. Here, we present a novel platform for fabricating complex 3D. Additive manufacturing (AM) technology effectively fabricates energy-storage materials with 3D structures by accurately constructing complex 3D structures via layer-by-layer deposition. The 3DOP electrode materials discussed here mainly include carbon materials, transition metal oxides (such as. Graphene, being a two-dimensional all-aromatic sheet bonded with sp 2 carbon atoms, has attracted much attention due to its excellent physicochemical properties like a large surface area, good electrical conductivity, and high thermal and chemical stability. The three-dimensional porous architecture, combining the high conductivity of graphene with the robust polymeric framework of poly (ethylene glycol.

Three-dimensional electrodes for electrochemical energy storage

Ideal Three-Dimensional Electrode Structures for Electrochemical Energy

Three-dimensional electrodes offer great advantages, such as enhanced ion and electron transport, increased material loading per unit substrate area, and improved mechanical stability upon ...

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This review summarizes recent advancements in 3D ordered porous (3DOP) electrode materials and their unusual electrochemical properties endowed by their intrinsic and geometric structures.

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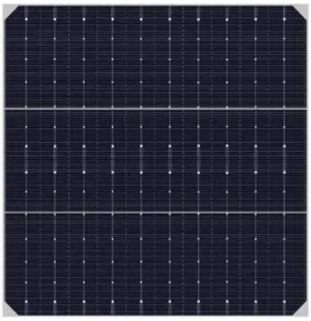

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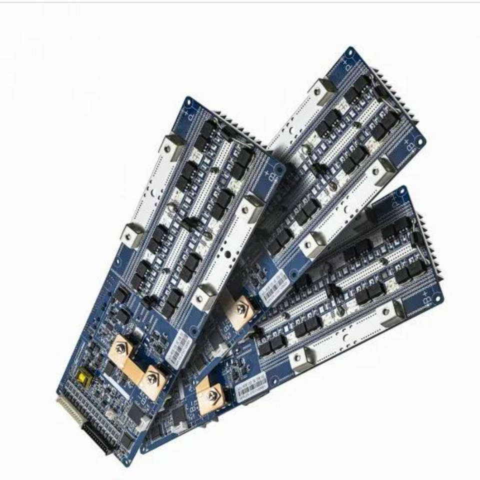

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