

Energy and Environmental Technology

Title An electrode structure for solid-state batteries

Abstract

The present invention provides an electrode structure for a battery. The electrode structure includes a current collector layer and a conductive layer. The conductive layer specifically includes conductive active particles and a conductive structure with a continuous pore structure. The conductive structure of the continuous pore structure is used as an ion channel to further improve the conductivity and current flow of the electrode; the battery has the electrode structure as its anode structure and cathode structure, through the porosity of the conductive structure in the electrode structure. The ratio is adjusted to prepare batteries according to different current flow and environment.

Benefits

1. The porous structure formed by the stacking of active material particles in the electrode structure itself allows lithium ions not only to use the pore structure as a transport channel, but also to shuttle in the active material particles forming the pore structure to maximize the bulk ion conductivity.
2. By reconstructing the design of the electrode structure, the problem of lithium-ion intercalation and extraction in the electrode is effectively solved, fast charge and discharge can be implemented, and the specific capacitance has been greatly improved compared with the conventional technology.
3. Through the solid electrolyte layer, the use of organic solvent is avoided in its composition, thereby eliminating the problem of organic solvents dissolving reaction intermediates, such as lithium sulfide, reducing the loss of active materials in the electrode, thereby slowing down the loss of electrode capacity, and reducing the risk of internal battery corrosion caused by the dissolution and diffusion of sulfides.

Industry Categories

Energy Industry, Materials Engineering, Environmental Engineering

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