Cadmium-based Coordination Polymer Nanorods and Microblocks as Anode Materials for Lithium-Ion Batteries

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Layered cadmium-based coordination polymer ([Cd(4,4'-bpy)(tfbdc)(H₂O)₂], Cd-LCP) nanorods and microblocks were synthesized by a facile hydrothermal method (4,4'-bpy = 4,4'-bipyridine, H₂tfbdc = tetrafluoroterephthalic acid). The Cd-LCP were characterized by IR spectrum, elemental analysis, powder X-ray diffraction, thermogravimetric analysis, scanning electron microscope (SEM), transmission electron microscope (TEM), and the Brunauer–Emmett–Teller (BET) surface. As an anode material of lithium-ion batteries, the Cd-LCP nanorods and microblocks showed a higher reversible capacity and an excellent cyclic stability, maintaining 231 mA h g⁻¹ after 50 cycles at 50 mA g⁻¹. Our results further confirm that searching for anode materials of lithium-ion batteries from 2D coordination polymer is an effective route.

Keywords: cadmium compound; coordination polymer; lithium-ion batteries; electrode material

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