Short Communication

Facile Synthesis of a High-Capacity $\text{LiNi}_{0.8}\text{Co}_{0.15}\text{Al}_{0.05}\text{O}_2$ Nanoplate Cathode with a {010} Orientation for Lithium-ion Batteries

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Ni-rich cathode $\text{LiNi}_{0.8}\text{Co}_{0.15}\text{Al}_{0.05}\text{O}_2$ nanoplates (NCA-NPs) are controlled synthesized using a facile and versatile method. The solvent (ethylene glycol) is very crucial for the formation of NCA-NPs which have exposed {010} electrochemically active planes. Applied in a lithium ion battery as the cathode, the NCA-NP sample sintered at 750 °C for 12 h demonstrates a high specific discharge capacity and an excellent rate capability, which can be attributed to the distinctive structures of the nanoplates with exposure to the {010} planes.

Keywords: Cathodes; Controlled synthesis; $\text{LiNi}_{0.8}\text{Co}_{0.15}\text{Al}_{0.05}\text{O}_2$; Lithium-ion batteries; {010}-oriented nanoplates

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