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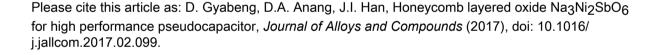
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Honeycomb layered oxide Na₃Ni₂SbO₆ for high performance pseudocapacitor

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Abstract

In this study, Na₃Ni₂SbO₆ was synthesised by simple solid state method and its electrochemical behaviour was examined as a supercapacitor electrode for the first time. Na₃Cu₂SbO₆ was also synthesized by the same preparation method in order to compare with the Na₃Ni₂SbO₆. The structure and morphology of the samples were characterized by XRD, XPS and SEM analysis. The results shows O3-type honeycomb layered Na₃Ni₂SbO₆ with microcrystal morphology. Electrochemical properties were characterized by cyclic voltammetry, galvanostatic charge/discharge measurements, and electrochemical impedance spectroscopy. The results showed that the specific capacitance of the Na₃Ni₂SbO₆ and Na₃Cu₂SbO₆ electrodes were 397 F/g and 50 F/g at the current density of 0.5 A/g respectively. The high pseudocapacitive nature of Na₃Ni₂SbO₆ can be attributed to reversible redox reaction of Ni(II)/Ni(III).

Keywords:

Na₃Ni₂SbO₆

Solid state synthesis

Supercapacitor

Electrode material

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