

Sodium gadolinium molybdate ($\text{NaGd}(\text{MoO}_4)_2$) nanocrystals as electrode material for electrochemical supercapacitors

이은희, 김은비, 모하마드임란, 사디아아민, 신형식[†]
전북대학교
(hsshin@jbnu.ac.kr[†])

In this work, the well-crystallized sodium gadolinium molybdate ($\text{NaGd}(\text{MoO}_4)_2$) nanocrystals are synthesized by hydrothermal process using the oleic acid mediation and then utilized as electrode material for electrochemical supercapacitors. In this synthesis, oleic acid played an important role in the morphologically controlled synthesis of $\text{NaGd}(\text{MoO}_4)_2$ nanocrystals with various morphologies. The synthesized $\text{NaGd}(\text{MoO}_4)_2$ nanocrystals are thoroughly analyzed in terms of crystalline nature, structural, composition and quality by different morphological, structural and optical characterization tools. The electrochemical properties of synthesized $\text{NaGd}(\text{MoO}_4)_2$ nanocrystals based supercapacitors are examined by cyclic voltammetry (CV), galvanostatic charge-discharge (GCD) and electrochemical impedance spectroscopy (EIS). The fabricated supercapacitors posed moderately good specific capacitance of 167.5 F/g with excellent retention ability by maintaining over 80% capacity. Based on the properties of synthesized $\text{NaGd}(\text{MoO}_4)_2$ nanocrystals, it is expected that it can be a promising candidate as an electrode material for electrochemical supercapacitor application.