

Revealing superior electrochemical kinetics of $\text{Na}_3\text{V}_2(\text{PO}_4)_3$ / rGO composite as a cathode material of Na-ion system

신강호, 박호석[†]
성균관대학교
(phs0727@skku.edu[†])

Due to high ionic conductivity of $\text{Na}_3\text{V}_2(\text{PO}_4)_3$ (NVP), stable three-dimensional structure and high theoretical capacity, NVP is attracting much attention as cathode material of Na-ion system. However, NVP has poor electronic conductivity and it causes poor rate capability and cycle stability. The aim of this research is to form a composites of NVP/rGO (reduced graphene oxide) to further improve electronic conductivity and structural stability, thereby improving the rate capability and cycle stability. rGO has the characteristics of excellent electronic conductivity, large surface area, which make rGO a suitable material for the conductive network. The NVP/rGO composites were synthesized by ice templating method. Electrochemical tests show that NVP/rGO composites has much more excellent cycle stability and rate capability than pristine NVP. The results show that NVP/rGO can be considered as a candidate for cathode materials with high rate capability and stability in hybrid Na-ion systems and that forming a composite with rGO can improve rate & cycle performance of electrode materials.