Li2MoO4 coated Ni-rich cathode for all-solid-state batteries

Hwan Wook Kwak, Yong Joon Park

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Li_2MoO_4 coated Ni-rich cathode for all-solid-state batteries

Hwan Wook Kwak and Yong Joon Park*

Department of Advanced Materials Engineering, Kyonggi University, 154-42, Gwanggyosan-Ro, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 16227, Republic of Korea

*Corresponding author
Department of Advanced Materials Engineering, Kyonggi University,
San 94-6, Iui-dong, Yeongtong-gu, Suwon-si, Gyeonggi 443-760, Korea
Ph: +82-31-249-9769; E-mail: yjpark2006@kyonggi.ac.kr

Abstract

Sulfide electrolytes are very attractive materials for all-solid-state cells because of their high ionic conductivity and good elasticity. However, they are highly reactive and can be easily oxidized due to their side reactions with an oxide cathode, which acts as a major cause for the inferior electrochemical performance of the all-solid-state cells when compared with general cells using liquid electrolytes. In this study, Li_2MoO_4 was used as the coating material of $Li[Ni_{0.8}Co_{0.15}Al_{0.05}]O_2$ cathode to stabilize the unstable cathode/sulfide electrolyte interface. The discharge capacity of the all-solid-state cells containing the composite electrode was increased by the introduction of Li_2MoO_4 coating. Moreover, the rate capability of the Li_2MoO_4 coated electrode was superior to that of the pristine sample. These results show that the Li_2MoO_4 coating is effective in suppressing the side reaction between the cathode and the sulfide electrolyte. The x-ray photoelectron spectroscopy analysis of the composite electrodes after