Novel Single Ion Conductor based on Inorganic-Organic Hybrid

최남순, 이용민, 박정기*, 정윤섭
한국과학기술원 생명화학공학과
(pjk@mail.kaist.ac.kr*)

Solid polymer electrolytes have received special attention for more than a decade due to their potential for application in a variety of solid state electrochemical devices particularly lithium secondary batteries, sensors, and electrochromic displays. One of the interesting fields in solid polymer electrolytes is the single ion conductor in which only the cation can be mobile under an electric field and which does not suffer from the concentration polarization caused by accumulation of anions on the anode. However, conventional single ion conductors showed low ionic conductivities (~10^{-7} S/cm) due to low dissociation. Recently, it was reported that the aluminate polymer based single ion conductors showed relatively high ionic conductivity of ~10^{-5}S/cm and that the ionic conductivity of the single ion conductor could reach 10^{-4}S/cm by introducing the plasticizer with a high dielectric constant.

In this work, the crosslinked single ion conductor, which the modified silica based on the inorganic-organic hybrid was used as a salt, was newly prepared and characterized. They exhibited good mechanical properties, high ionic con ductivities, and good interfacial stability to the lithium electrode.