

Investigation on properties of Lithium Phosphorus Oxy-nitride (LiPON) films deposited by metal-organic chemical vapor deposition (MOCVD)

부비엣투안, 김홍탁, 박진호†
영남대학교
(chpark@ynu.ac.kr†)

Lithium phosphorous oxy-nitride (LiPON) thin film electrolytes have drawn much interest in solid state thin film batteries due to its moderate Li-ion conductivity ($\sim 10^{-6}$ S/cm) and stability upon contact with Li anode. Li-sulfide and Li-oxide electrolytes have higher Li-ion conductivity ($10^{-3} \sim 10^{-4}$ S/cm) and thus, recently, there are many efforts to use them in solid state batteries. But, both electrolytes are known to be easily decomposed around the potential of 5 V and very chemically unstable in contact with a Li metal anode. One of the common problems encountered in the development of LiPON thin film electrolytes is the relatively low deposition yield and crack formation on the cathode. In this study, LiPON thin films were deposited by MOCVD technique, and parametric investigation was conducted to enhance the growth rate of LiPON thin films by varying the deposition conditions. Organometallic precursor for LiPON films were Li (C₁₁H₁₉O₂), Li(DPM) and PO(C₂H₅O)₃ (TEP). N₂ was used as a carrier gas and NH₃ was the nitridation gas.