

3rd International Conference on

ELECTROCHEMISTRY

July 10-11, 2017 Berlin, Germany

Characterization of anion substitution effect on olivine structured cathode materials for lithium-ion battery

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Olivine structured LiMPO_4 ($M=\text{Fe, Mn, Co}$) has attracted considerable interest as a new class of cathode material for the next generation lithium ion battery because of their intrinsic merits: high theoretical capacity, excellent thermal stability, structural stability, environment friendly, and low material cost compared to commercial cathode materials. The substitution of anion, such as F-, I-, and BO_3^{3-} , on phosphate site in olivine material had been prepared by solid state reaction without additional carbon sources. Samples were characterized by XRD, SEM, TEM with EDX mapping, XPS, galvanostatic charge-discharge testing, and solid-state NMR spectroscopy. All of prepared samples had shown enhanced initial discharge capacity and long cycleability. Details results with additional ongoing study will be discussed in the presentation.

Biography

Youngil Lee has completed his PhD from Louisiana State University and is currently a Professor in the Department of Chemistry at University of Ulsan. He has studied the characterization and synthesis of cathode materials for lithium ion battery and has published more than 90 papers in reputed journals. He is interested to study the solid-state NMR spectroscopy and the relationship between the microstructure and electrochemical properties for energy materials.

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