

## MS18-04 | CRYSTAL GROWTH AND STRUCTURAL AND ELECTROCHEMICAL PROPERTIES OF GARNET-TYPE LITHIUM ION CONDUCTING OXIDES

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Lithium ion batteries are required improvement in safety and high energy density, because of wide applications from small-sized electrical devices to large-sized power sources. Especially, all solid state Li-ion batteries (LIB) using solid oxide electrolyte have attracted attention as next-generation batteries without inflammable organic liquid electrolytes. Among many candidates of Li-ion conducting oxide materials as solid electrolyte for all solid state LIB, the garnet-type  $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$  is most suitable because of both high Li-ion conductivity and wide electrochemical potential window. We recently focused on the Ta-substituted  $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$  materials having a relatively higher Li-ion conductivity at room temperature. We synthesized sintered body and single crystal samples of  $\text{Li}_{6.5}\text{La}_3\text{Zr}_{1.5}\text{Ta}_{0.5}\text{O}_{12}$  [1-3], and determined precise structural and electrochemical properties. A relationship between the detailed Li-ion arrangement in the garnet structure and the Li-ion conductivity will be presented.

This study was supported by the Advanced Low Carbon Technology Research and Development Program (ALCA-SPRING) from Japan Science and Technology Agency (JST).

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