

## Synthesis and electrochemical characteristics of Ga-doped LLZO electrolyte for all solid lithium secondary batteries

Ha-Young Jung<sup>a</sup>, Hye-Min Ryu<sup>a</sup>, Sang-Jun Park<sup>a</sup>, Hee-Jung Ban<sup>a</sup>,  
Min-Young Kim<sup>a</sup>, Ho-sung Kim<sup>a</sup>,

<sup>a</sup> *Korea Institute of Industrial Technology (KITECH), 6, Chemdan-gwagiro 208-gil, Buk-gu, Gwangju, 61012, Republic of Korea*

E-mail: hosung42@kitech.re.kr

Lithium ion secondary batteries have been widely used with high capacity and energy density. However, safety problems such as explosion of organic electrolytes have been raised, all solid lithium secondary batteries which do not use organic electrolytes have been attracting attention as next generation batteries [1]. Garnet-type solid electrolytes has good advantages with stable in the atmosphere and electrochemical potential window. In this study, gallium-doped LLZO material, which are cubic single phase and nano-grade size, was synthesized by Taylor reactor process. As a result, the ionic conductivity of the Ga-LLZO material was about  $1.2 \times 10^{-3} \text{ S cm}^{-1}$  at room temperature, indicating a wide electrochemical window of 0~6.0 V. Furthermore, all solid lithium batteries were fabricated using Ga-LLZO material and the electrochemical properties were investigated in more detail.

### References:

[1] J. M. Tarascon, M. Armand, Nature 414 (2001) 359-367.