

Self-standing hybrid solid electrolytes with spherical shape  $\text{Li}_{1.3}\text{Al}_{0.3}\text{Ti}_{1.7}(\text{PO}_4)_3$  ceramic filler for all-solid-state batteries

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Hybrid solid electrolytes consisting of polymer solid electrolytes (PSE) matrix with inorganic electrolyte filler can integrate the merit of both solid electrolyte (SE) systems. With the inorganic electrolyte filler, mechanical and electrochemical property of PSE can be enhanced. Also, amorphization effect of inorganic filler can enhance ionic conductivity of PSE matrix. However, with conventionally fabricated inorganic electrolyte filler, it is difficult to achieve high filler content due to powder aggregation. Here, we synthesized NASICON type  $\text{Li}_{1+x}\text{Al}_x\text{Ti}_{2-x}(\text{PO}_4)_3$  (LATP) inorganic filler by spray pyrolysis process. The synthesized LATP submicron powders showed high purity and spherical shape. With shape and size-controlled filler, we fabricated self-standing hybrid electrolyte sheet with high LATP filler content. The fabricated hybrid electrolyte sheet showed good mechanical and electrochemical property with high ionic conductivity up to  $10^{-3}\text{S/cm}$ .

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