

Solid-State Sodium Conductor for Solid-State Battery

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Abstract : Solid-state battery adopts solid-state electrolyte such as oxide- and composite-based solid electrolytes. With the adaption of nonflammable or less flammable solid electrolytes, the safety of solid-state batteries can be largely increased. NASICON ($\text{Na}_3\text{Zr}_2\text{Si}_2\text{PO}_{12}$, NZSP) is one of the sodium ion conductors that possess relatively high ionic conductivity, wide electrochemical stable range and good chemical stability. Therefore, it has received increased attention. We report the development of high-density NZSP through liquid phase sintering and its organic-inorganic composite electrolyte. Through reactive liquid phase sintering, the grain boundary conductivity can be largely enhanced while using an organic-inorganic composite electrolyte, interfacial wetting and impedance can be largely reduced hence being possible to fabricate scalable solid-state batteries.

Keywords : solid-state electrolyte, composite electrolyte, electrochemical performance, conductivity

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