Supporting Information

Metastable chloride solid electrolyte with high formability for re-chargeable all-solid-state lithium metal batteries

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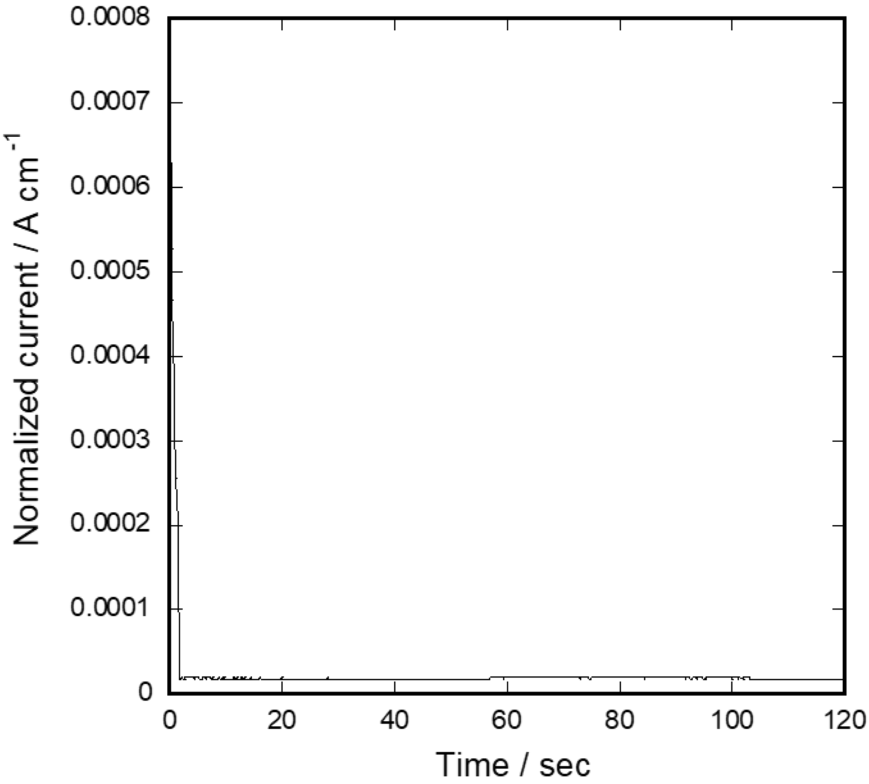
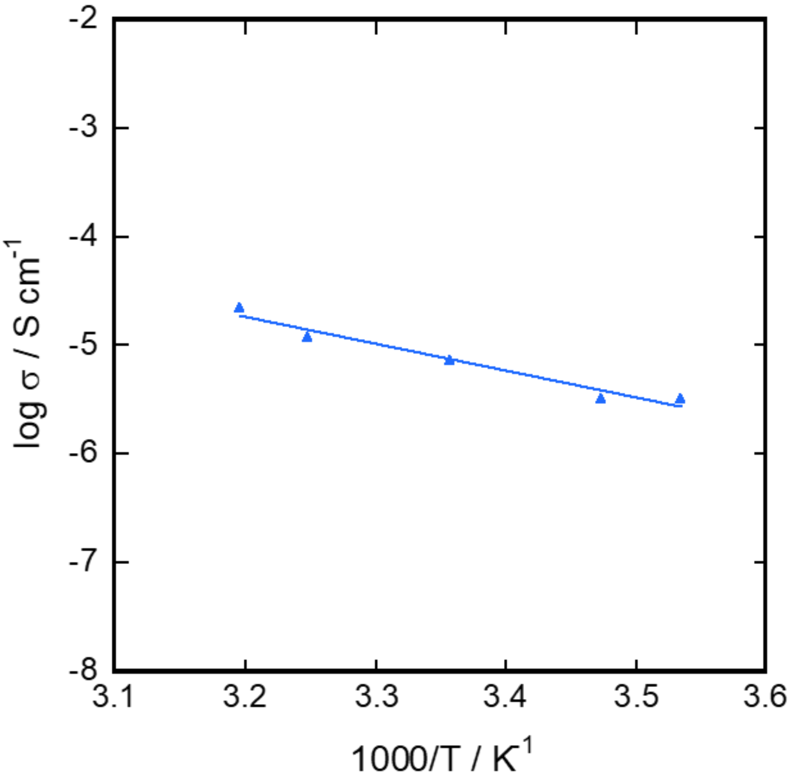
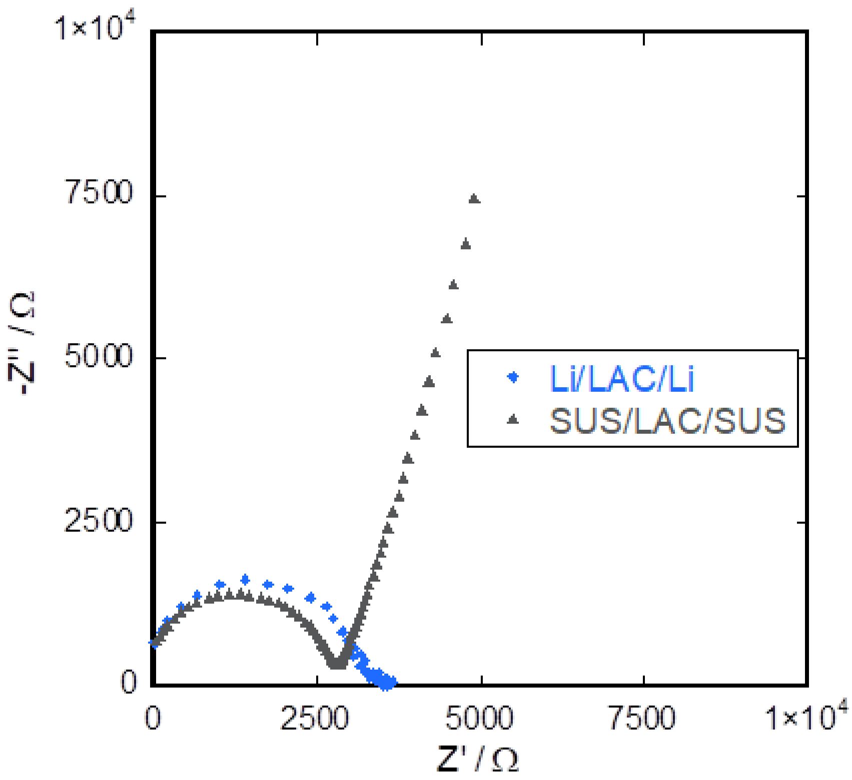


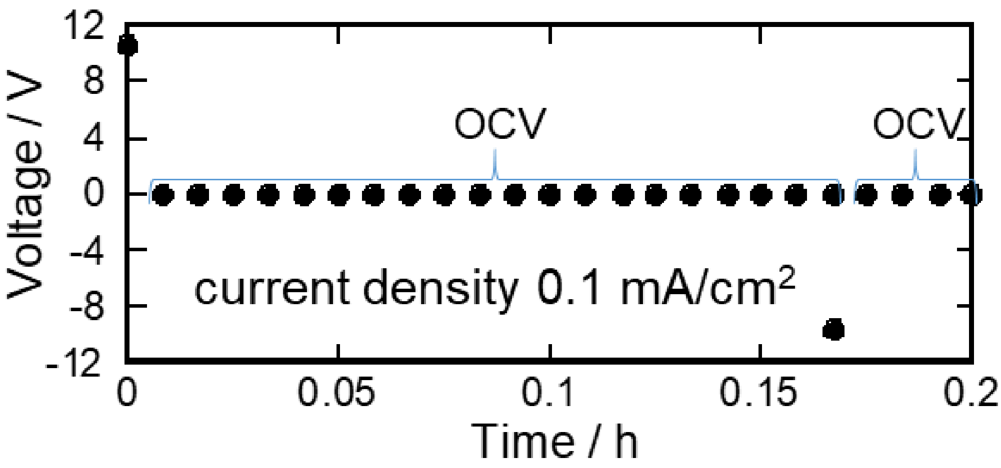
Supporting Figure S1. DC polarization curve for the powder-compressed pellet of the mechanochemical synthesized $LiAlCl_4$ sample. The applied voltage is 1 V. The sharp drop in the current and the low steady-state current indicates the low contribution of electrical conductivity in the $LiAlCl_4$ material.



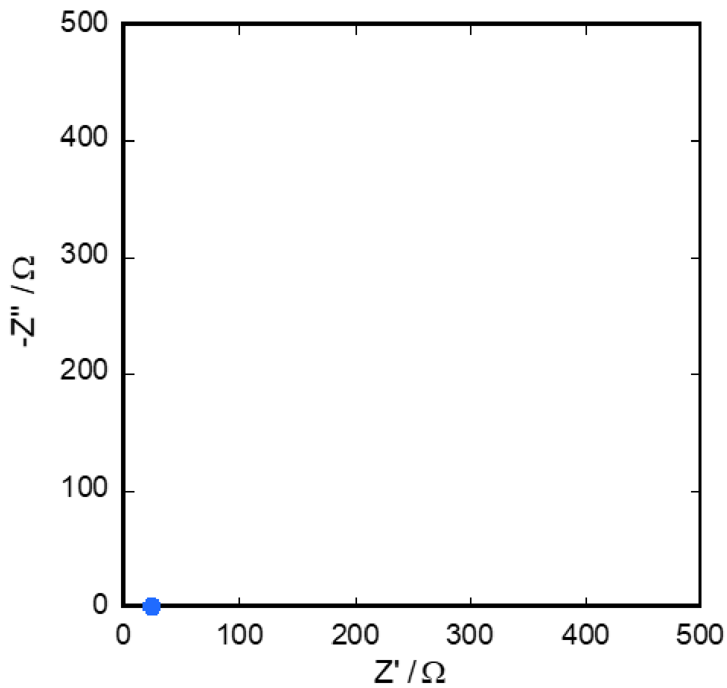
Supporting Figure S2. Arrhenius plots of the total conductivity for the powder-compressed pellet of the mechanochemical synthesized $LiAlCl_4$ sample.



Supporting Figure S3. Impedance plots of $LiAlCl_4$ green compacts at 25 °C sandwiched with stainless steel (SUS) or Li metal electrodes.



Supporting Figure S4. Galvanostatic cycle performance of the Li symmetric cells with solid electrolyte of $Li_{6.6}La_3Zr_{1.6}Ta_{0.4}O_{12}$ green compacts at 25 °C at the current density of 0.1 mA cm^{-2}.



Supporting Figure S5. Impedance plots of the Li symmetric cells with solid electrolyte of $Li_{6.6}La_3Zr_{1.6}Ta_{0.4}O_{12}$ green compacts at 25 °C after the first cycle at the current density of 0.01 mA cm^{-2}.