LA-UR 12-01193

Licensable Technologies

Solid Electrolyte Compositions

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Summary:

Gel-liquid chemical systems are the electrolytes present in lithium batteries and other electrochemical devices. Gel-liquid chemical systems include solvents, and they utilize solvated lithium ions for ion conduction. To deliver energy at a high rate, these electrolytes must be able to sustain a high capacity for rapid transport of lithium ions to and from the electrodes of the batteries over a broad range of temperatures. Solvents in lithium batteries promote rapid lithium transport, but they can limit the applied voltage, and they can leak out of the battery. Improvement in lithium ion transport in solid electrolytes to reach a super-ionic state would allow the application of lithium metal anode to improve battery performance in terms of high energy density. Enhanced lithium transfer rates would boost ionic conduction and thus improve the battery performance in terms of high power capacity. The development of better lithium ion conductors is expected to lead to better rechargeable batteries for electric vehicles and other applications.

Development Stage:

Small amounts of materials have been produced.

Patent Status:

Non-provisional patent has been filed. U.S. patent application no. S-121,580.

Licensing Status:

Available for exclusive or non-exclusive licensing.

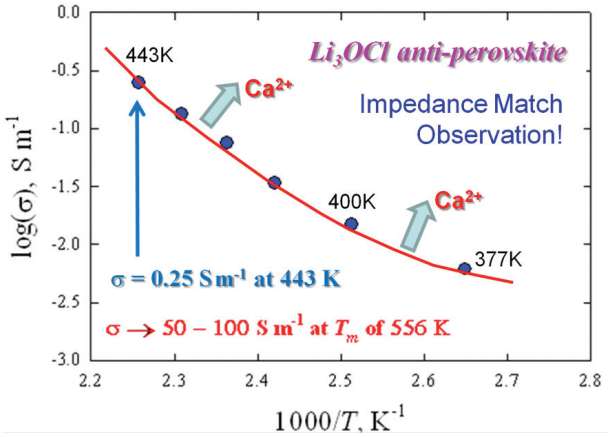

Figure 1: A graph of ionic conductivity as a function of temperature for the anti-perovskite Li_3OCl.

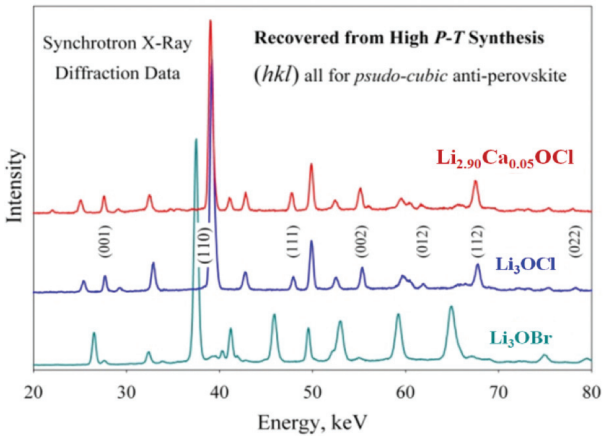

Figure 2: X-ray diffraction data collected for the as-recovered samples of the anti-perovskites of $Li_{2.90}Ca_{0.05}OCl$ (top), Li_3OCl (middle), and Li_3OBr (bottom).

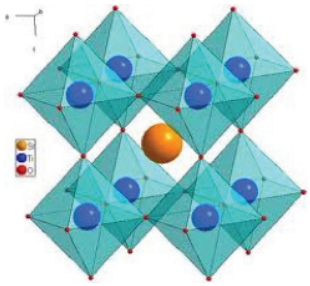

Figure 3: Standard perovskite structure $SrTiO_3$.

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