

New Nonflammable Perfluoropolyether-Based Electrolytes for Rechargeable Lithium-Ion Batteries

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New Nonflammable Perfluoropolyether-based
Electrolytes for Rechargeable Lithium-Ion Batteries

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The flammability of conventional alkyl carbonate electrolytes hinders the prominence of lithium (Li) ion batteries in vehicles and aircrafts. Herein, we will describe new classes of nonflammable liquid electrolytes composed of low molecular weight fluorinated polyethers. These materials exhibit high lithium salt loading, high thermal stability, and operable conductivity at wide temperature ranges. Preliminary measurements of the transference number also suggest a large contribution from the lithium ion to the overall conductivity relative to the anion. (**Figure 1**). Full electrochemical cells built with these electrolytes show good performance in galvanostatic cycling, indicating its potential for rechargeable batteries.

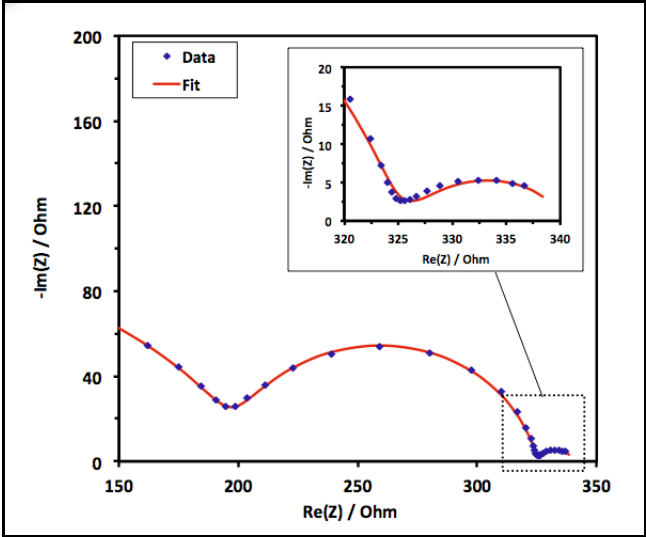


Figure 1. Nyquist plot obtained from symmetrical cells built with fluorinated polyether-based electrolyte.