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Research Paper

# New Single Ion Conducting Blend Based on PEO and PA-LiTFSI

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## Highlights

- New SPE based on modified polyacrylic acid and PEO is proposed.
- High transference number and ionic conductivity of 1.77 $10^{-5}$ S $cm^{-1}$ at 80 °C.
- Wide electrochemical stability window toward lithium electrode.

## Abstract

New synthesis route of polysalt with single ion conductivity based on functionalization of polyacrylic acid is reported for all solid state lithium metal batteries. Poly[(trifluoromethyl)sulfonyl acrylamide] PA–LiTFSI was synthesized in two steps reaction. The degree of functionalization of the polymer backbone by anion of lithium salt bis(trifluoromethane)sulfonimide (LiTFSI) was confirmed by ICP analysis. An ionic conductivity equal 1,77 $10^{-5}$ S $cm^{-1}$ at 80 °C of polysalt blended with PEO is reported. Easy process-able polysalt blended with PEO exhibits good mechanical properties and high transference number.

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