

Abstract Submitted  
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**Highly conductive polymer electrolyte membranes modified with polyethylene glycol-bis-carbamate**<sup>1</sup> GUOPENG FU, Univ of Akron, JANEL DEMPSEY, John Carroll University, THEIN KYU, Univ of Akron — By virtue of its non-flammability and chemical stability, polyethylene glycol (PEG) networks have shown potential application in all solid-state polymer electrolyte membranes (PEM). However, room temperature ionic conductivity of these PEG based PEMs is inherently low. Plasticization of these PEMs is needed to improve the ionic conductivity. It was demonstrated by this group that small-molecule plasticizers such as succinonitrile, ethylene carbonate, or urea-carbamate can boost ionic conductivity of solid-state polymer electrolyte membranes. Polyethylene glycol bis-carbamate (PEGBC) was synthesized via condensation reaction of polyethylene glycol diamine and ethylene carbonate. The PEGBC modified PEM has shown higher ionic conductivity relative to the unmodified PEM. Moreover, PEGBC modified PEM has a better thermal stability relative to ethylene carbonate based liquid electrolyte with enhanced ionic conductivity.

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