

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Polyhedral Oligomeric Silsesquioxanes – Based Hybrid Electrolytes with Controlled Network Structure** QIWEI PAN, South China University of Technology; Drexel University, CHRISTOPHER LI, Drexel University, DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING, SOUTH CHINA UNIVERSITY OF TECHNOLOGY TEAM, DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING, DREXEL UNIVERSITY TEAM — High ion conductivity and mechanical integrity are the most important properties in the application of solid polymer electrolytes (SPEs). We herein report synthesis and characterization of hybrid electrolytes with inorganic polyhedral oligomeric silsesquioxanes (POSS) as the crosslinker. The SPEs were prepared by a facile one-pot reactions between octakis[3-(glycidyoxy)propyldimethylsiloxy]silsesquioxane and bis(3-aminopropyl) terminated poly(ethylene glycol) (PEG) in the present of bis(trifluoromethane)sulfonimide lithium salt (LiTFSI). Uniform distribution of POSS and LiTFSI in the SPEs were confirmed by SEM-BSD and SEM-EDX. We show that both ionic conductivity and mechanical properties of the SPE can be easily tuned by varying POSS contents. Correlation between the SPE network structure and the ionic conductivity and mechanical properties will be discussed.

Qiwei Pan  
Drexel University

Date submitted: 14 Nov 2014

Electronic form version 1.4