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**Electrochemical Stability of Model Polymer Electrolyte/Electrode Interfaces** DANIEL HALLINAN, GUANG YANG, Florida State Univ — Polymer electrolytes are promising materials for high energy density rechargeable batteries. However, typical polymer electrolytes are not electrochemically stable at the charging voltage of advanced positive electrode materials. Although not yet reported in literature, decomposition is expected to adversely affect the performance and lifetime of polymer-electrolyte-based batteries. In an attempt to better understand polymer electrolyte oxidation and design stable polymer electrolyte/positive electrode interfaces, we are studying electron transfer across model interfaces comprising gold nanoparticles and organic protecting ligands assembled into monolayer films. Gold nanoparticles provide large interfacial surface area yielding a measurable electrochemical signal. They are inert and hence non-reactive with most polymer electrolytes and lithium salts. The surface can be easily modified with ligands of different chemistry and molecular weight. In our study, poly(ethylene oxide) (PEO) will serve as the polymer electrolyte and lithium bis(trifluoromethanesulfonyl) imide salt (LiTFSI) will be the lithium salt. The effect of ligand type and molecular weight on both optical and electrical properties of the gold nanoparticle film will be presented. Finally, the electrochemical stability of the electrode/electrolyte interface and its dependence on interfacial properties will be presented.

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