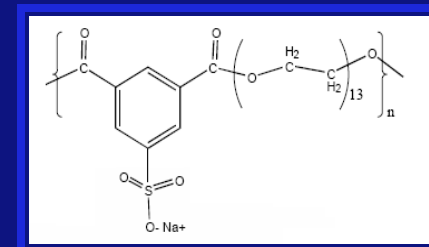
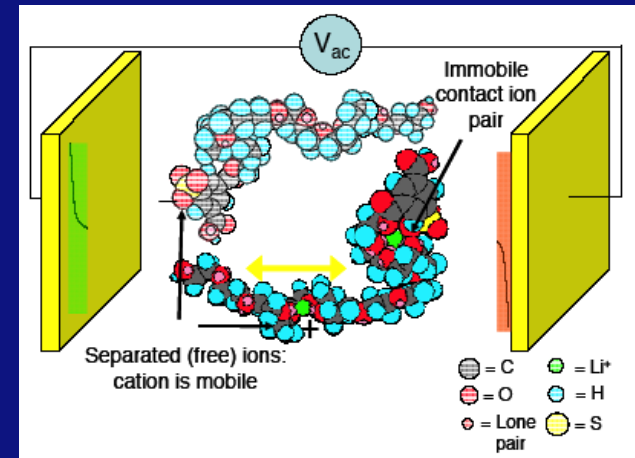


Tailoring Ion Containing Polymers for Energy Storage Devices

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- Development of safer and high conductivity polymer-based electrolytes for Li ion batteries is a critical challenge. As an intermediate step, plasticized polymer electrolytes (PPEs) with modest plasticizer fractions are of importance.
- Overall program goal: *develop an understanding of the three-fold interactions occurring in model PPEs – plasticizer -polymer, polymer-salt, and plasticizer t-salt – so that design parameters for mechanically durable, high-conductivity PPEs can be established.*

- Initial experiments have focused on contrasting polymer dynamics and ion conductivity of a poly(ethylene oxide-based) ionomer (repeat unit structure on the lower right), with plasticized forms containing 6 wt % of six miscible diluents.
- Measured conductivity of the PPEs found to have statistically insignificant dependence on plasticizer dielectric constant and donor number, no dependence on viscosity, and an overwhelmingly strong dependence on T_g of the mixtures.
- Using these initial findings as a guide, we are now exploring conductivity and its relationship to polymer dynamics for the same plasticizers over a wider concentration range.



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