

Na-Ion Conducting Membranes for Nonaqueous Redox Flow Batteries

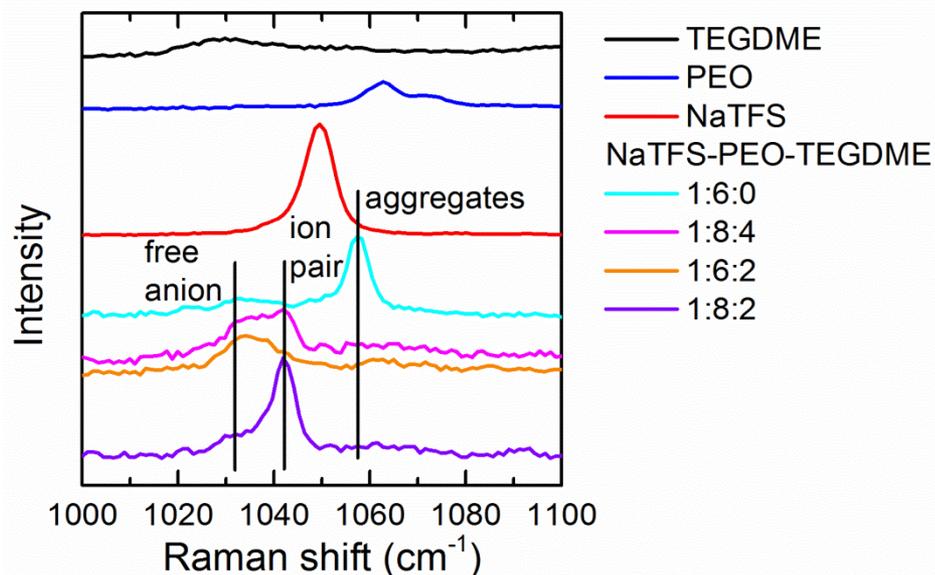
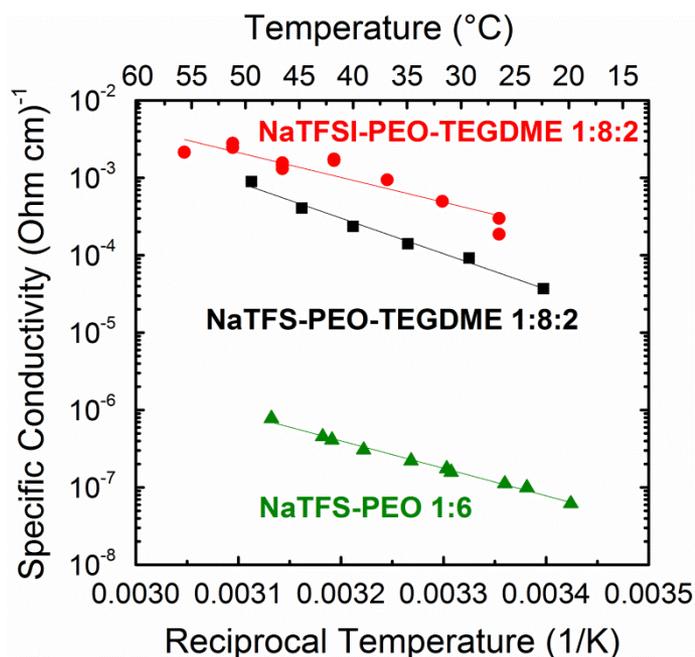
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2015 Goal: Develop Na-ion conducting membranes for anion radical based redox flow batteries

Approach: Using tetraethylene glycol dimethyl ether (TEGDME) as a plasticizer we increase the ionic conductivity of poly(ethylene oxide) PEO membranes by several order of magnitude using sodium triflate (NaTFS) and sodium bis(trifluoromethanesulfonyl)imide (NaTFSI) salts

Results:

- Plasticizing with TEGDME yields 3 orders of magnitude increase in ionic conductivity for NaTFS and 4 orders of magnitude increase for NaTFSI
- Raman and FT-IR studies of ion coordination correlate with conductivity measurements



Measurements of ionic conductivity of PEO membranes with and without TEGDME plasticizer

Raman spectroscopy showing change in coordination of TFS anion in different PEO membranes