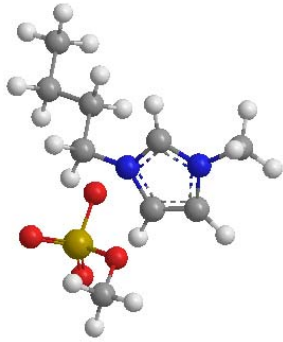


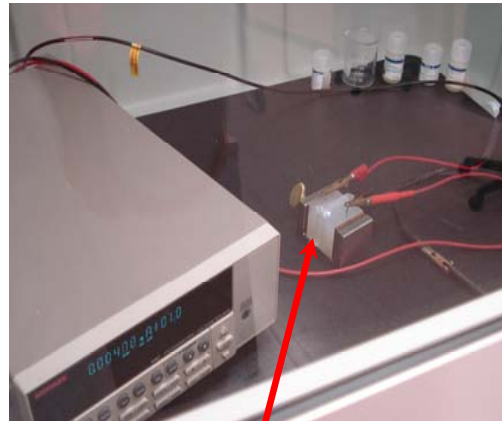
# Conductivity of Ionic Liquids at the Nanoscale

Zuzanna S. Siwy, University of California, Irvine

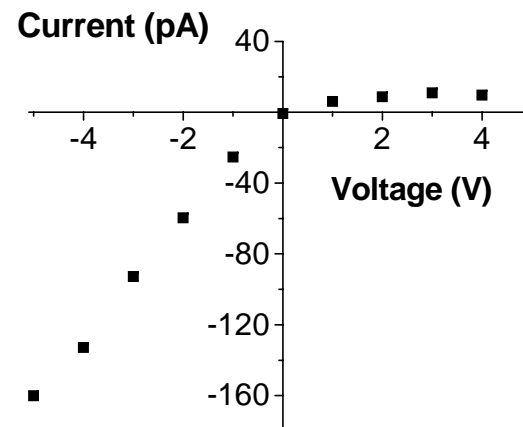
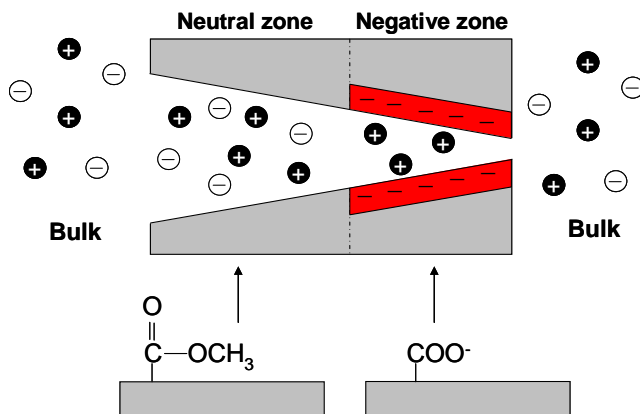
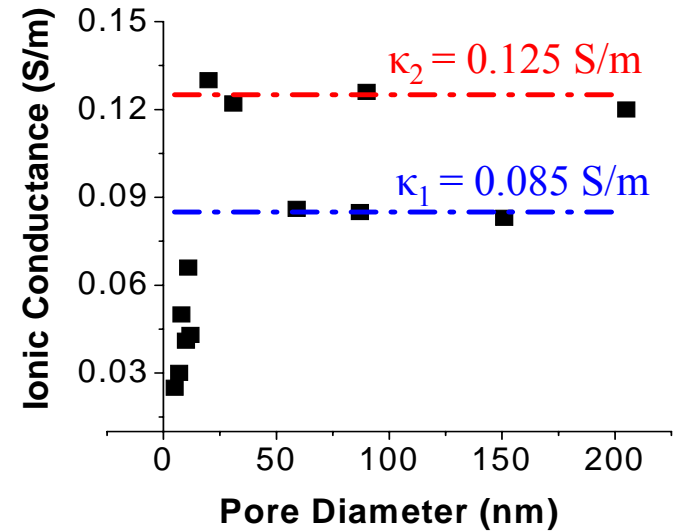


In the research we used primarily 1-butyl-3-methylimidazolium methyl sulfate

A series of pores with diameters ranging from several nm up to 400 nm was prepared and used for studying ionic conductivity of ionic liquids. The ionic conductivity was found to be strongly dependent on the pore diameter being smaller for pores with diameters < 20 nm.



Single pore membrane



(Right) Ionic current carried by 1-butyl-3-methylimidazolium methyl sulfate through a single conical nanopore that contained surface charge pattern shown in the left panel. The surface charge pattern was obtained by asymmetric modification of a conical pore in polyethylene terephthalate that contains intrinsic negative charges with trimethylsilyldiazomethane. The small opening of this pore had a diameter of 7 nm [Davenport et al. *Nano Lett.* **8** (2009)].