

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Lithium ion migration via ion concentration gradient in bilayer polymer electrolyte membranes¹ CAMILO PIEDRAHITA, JINWEI CAO, THEIN KYU, University of Akron — Ion concentration gradient across the cell membrane plays a key role in neuron cells to produce and transmit electrical signals throughout our body. Different ion populations across the cell membranes along with specific channels, gates and pumps promote ion movement in/out of the cell generating electrical signal. The ion transport was mimicked in the solid bilayer PEM consisted of PEGDA/LiTFSI/SCN with different Li-ion populations; one (PEM1) high in Li⁺ concentration and another (PEM2) low in ion concentration (or 0 wt%). When these two membranes are stacked together, Li⁺ can diffuse due to the ion concentration gradient. Cyclic voltammetry (CV) was conducted to probe the ion displacement from solid PEM1 to PEM2 in a coin cell (SS/PEM2/PEM1/Li) during charge/discharge cycling and recovery of Li⁺ concentration during resting. Anodic peaks emerged in the respective CV spectra as Li⁺ migrates from high to low ion concentration PEM. FTIR analysis on bilayered PEM surfaces further provides evidence of Li⁺ migration via trans-gauche transformation of ether linkages.

¹NSF-DMR 1502543

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Date submitted: 07 Nov 2016

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