

NMR Spectroscopy of Modified Nafion Membranes

Kelsey Gritter, Alyx Aarbo, Wes Verbeek, and Kristopher Ooms* (The King's University)

Oral Presentation Abstract:

NMR studies of the water dynamics in five different Nafion membranes were performed: N115, N117, NR212, XL, and HP. Experiments were conducted at two temperatures and multiple hydrations using zero and double quantum filtered ^2H NMR spectroscopy with the goal of characterizing the differences between the membranes over a range of conditions important in operating fuel cells. Changes in experimental observables provide insights into the changing water dynamics and environments within the membranes. The parameters obtained are discussed in relation to membrane thickness, reinforcement, and membrane preparation method. In addition, the variable temperature studies indicate that the temperature responses cannot be explained using simple models based on increased water kinetics

* Indicates faculty mentor